

Stroud District Council

Infrastructure Delivery Plan

2022 Addendum

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Contents

1.	Introduction	1
1.1	Status update	1
1.2	Methodology	1
2.	Infrastructure Assessment	2
2.1	Transport	2
2.2	Education	2
2.3	Open Space, Green Infrastructure and Biodiversity	5
3.	Strategic Site Allocations	9
3.1	Introduction	9
3.2	Cam North West (PS24)	10
3.3	Cam North East Extension (PS25)	12
3.4	Hunts Grove Extension (PS30)	14
3.5	Sharpness Docks (PS34)	16
3.6	Sharpness (PS36)	18
3.7	Stonehouse North West (PS19a)	21
3.8	South of Hardwicke (G1)	23
3.9	Wisloe (PS37)	25
3.10	Whaddon (G2)	27
	Appendix A – Site-by-site Projects	29

Tables

Table 1:	Highway Mitigation extract from Aecom Mitigation Review	1
Table 2:	Pupil Product Ratios & Costs	3
Table 3:	Demands & Costs for Education in Stroud	3
Table 4:	Demands & Costs for Education (Sensitivity testing based on population data)	4
Table 5:	Cotswold Beechwoods SAMM Costs	7
Table 6:	Rodborough Common SAMM Costs	8
Table 7:	Housing Trajectory for Strategic Site Allocations	9
Table 8:	Education demands and costs for Cam North West	10
Table 9:	Education demands and costs for Cam North East Extension	13
Table 10:	Education demands and costs for Hunts Grove Extension	15
Table 11:	Education demands and costs for Sharpness Docks	17
Table 12:	Education demands and costs for Sharpness	19
Table 13:	Education demands and costs for Stonehouse North West	21
Table 14:	Education demands and costs for South of Hardwicke	23
Table 15:	Education demands and costs for Wisloe	25
Table 16:	Education demands and costs for Whaddon	28
Table 17:	Cam North West Projects	30
Table 18:	Cam North East Extension Projects	31

Table 19: Hunts Grove Extension Projects	32
Table 20: Sharpness Docks Projects	33
Table 21: Sharpness Projects	34
Table 22: Stonehouse North West Projects	35
Table 23: South of Hardwicke Projects	36
Table 24: Wisloe Projects	37
Table 25: Whaddon Projects	38

Appendices

Appendix A - Site by Site Projects

1. Introduction

1.1 Status update

Following the submission of the Regulation 19 version of the Stroud District Local Plan Review in October 2021, a refresh of evidence is required to the Council's Infrastructure Delivery Plan ('IDP') to support the upcoming Local Plan Review examination.

Given the passage of time and the considerable work that has been undertaken since the last version of the IDP was completed, this addendum seeks to provide an update to the Local Plan Review: Infrastructure Delivery Plan 2021 (the 2021 IDP).

1.2 Methodology

The following scope of work has been undertaken to ensure that the evidence base for the Local Plan Review examination is up-to-date, accurate and reflects the anticipated areas of contention:

Section 2 - Update to the IDP Infrastructure Assessment

- Receipt and review of latest transport information, including: the National Highways, GCC and SGC objections; SoCGs with these stakeholders; working group minutes; and work completed to date on the Stonehouse Bristol Road outline business case.
- Receipt and review of up-to-date education information, including relevant appeal documents, GCC's Interim Position Statement on PPRs and Local Development Guide. A workshop with GCC Education to understand the latest infrastructure demands.
- Receipt and review of the latest biodiversity and green infrastructure information and consultation with the Gloucestershire Local Nature Partnership, GCC and the Gloucestershire Nature and Climate Fund.

Section 3 – Strategic Site Allocation infrastructure assessment

The IDP addendum also provides a site-by-site summary of infrastructure requirements, restructured from the topic-by-topic assessment presented by sub-area in the 2021 update. This section also includes consideration of the updated information gathered within Section 2.

Appendix A – Strategic Site Allocation infrastructure projects

This section presents the likely schemes required to support growth associated with the Strategic Site Allocations.

2. Infrastructure Assessment

2.1 Transport

This section seeks to update the assessment of transport infrastructure undertaken within the June 2021 version of the Stroud IDP. This update is provided on the basis of the following key changes since 2021:

- Representations from South Gloucestershire Council, Gloucestershire County Council and National Highways have been received in response to the Pre-submission Draft Local Plan Review consultation, raising concerns about transport and highways impacts of planned growth.
- Stroud District Council has commissioned the technical review by Aecom of the mitigation proposed within the Traffic Forecasting Report¹ (TFR) and the Local Transport Plan (LTP). This document is referred to as the ‘Aecom Mitigation Review²’ throughout this report.
- The Aecom Mitigation Review has identified a package of measures for three locations: Junctions 12 and 14 of the M5, and the A38 corridor. A Funding and Delivery Plan³ has been produced by Aecom to determine how these transport infrastructure requirements could be delivered to support Local Plan Review growth. This work provides apportioned costs for a number of site allocations within the Local Plan Review.
- Stroud District Council, working in partnership with Stonehouse Town Council, secured DfT Restoring your Railway Ideas Fund to produce an outline business case to support the reopening of the Stonehouse Bristol Road Station.

2.1.1 The Strategic Road Network

M5 Junction 12

The National Highways consultation response highlights that the 2021 IDP identified that developer contributions were likely to be required from housing sites at Hunts Grove (PS30), South of Hardwicke (G1) and Land at Whaddon (G2) towards improvements to Junction 12. The same applies to the employment sites at Quedgeley East Extension (PS32) and Javelin Park (PS43).

National Highways raises concerns that these infrastructure requirements did not translate into the Policy wording for these sites and requests that Policies PS30, PS32, PS43, G1 and G2 explicitly reference the need for improvements at M5 Junction 12, as identified by the IDP.

The Aecom Mitigation Review identifies a scheme at a cost £6,250,000 to provide a new grade-separated junction and signalised approach lanes (and signal optimisation).

The Aecom Mitigation Review also identifies that a number of TFR and LTP schemes could be considered as part of a wider M5 Junction 12 package. These include junction improvement at the A38 Cross Keys Roundabout, the signalisation of the B4008 / Stonehouse and the dualling of the B4008 south of M5 J12. The total cost of these schemes is estimated at £9.4m.

Full details of the methodology for apportioning infrastructure costs are provided within the Funding and Delivery Plan. In summary, the Funding and Delivery Plan sets out that Stroud Local Plan Review growth accounts for 38% of the impact on Junction 12 and the other related schemes. The remainder of transport impacts are from economic growth and strategic development sites and small / windfall development sites in neighbouring authorities such as the Joint Core Strategy Area.

Using traffic modelling, it has been possible to determine the impact of the sites upon the junctions / locations within the Junction 12 scheme. The following strategic and local development site allocations

¹ Mott MacDonald (2021) Stroud Local Plan Traffic Modelling – Traffic Forecasting Report.

² Aecom (2022) Stroud District Council Local Plan Mitigation Review.

³ Aecom (2022) Stroud District Council Funding and Delivery Plan.

within the Local Plan Review are anticipated to affect the Junction 12 area. It is expected that these Strategic Site Allocations would contribute towards this package, along with development sites within the Joint Core Strategy Area (Gloucester, Cheltenham and Tewkesbury Districts).

- G1 - South of Hardwicke
- G2 - Land at Whaddon
- PS20 – EcoPark M5 J13
- PS30 - Hunts Grove Expansion
- PS43 - Javelin Park

Apportioned costs from the Funding and Delivery Plan for the Strategic Site Allocations are included within Appendix A.

M5 Junction 13

National Highways identified that the infrastructure requirements identified for M5 Junction 13 ('J13') in the Traffic Forecasting Report and the 2021 IDP did not translate into the policies of the Local Plan Review.

National Highway requested as part of their response to consultation that Policies PS19a and PS20 are strengthened to reference the need for improvements at J13, reflecting the references to the A38 and A419 in other bullets.

The Aecom Mitigation Review identifies a potential scheme of improvement at J13, inclusive of approach arm signalisation and optimisation of signals. It is expected that the following Strategic and Local Site Allocations would contribute towards this scheme:

- PS19a - Northwest of Stonehouse
- PS20 – EcoPark M5 J13
- PS24 - West of Draycott
- PS25 - East of River Cam
- PS45 - Land west of Upton's Gardens
- PS46 - Land west of School Lane
- PS44 - Northwest of Whitmister Lane
- PS37 - New Settlement at Wisloe

Other related schemes within the LTP and the TFR include the proposed improvement of the A419 at Stonehouse.

M5 Junction 14

South Gloucestershire Council ('SGC'), Gloucestershire County Council ('GCC') and National Highways raised concerns about the impact of strategic housing and mixed-use developments at Sharpness/Berkeley (PS34/PS36) on the operation of the transport network. In addition, SGC raised concerns about Wisloe (PS37) and the employment allocation adjacent to Renishaws (P47) on the cross-boundary highway impacts.

Specifically, National Highways, GCC and SGC raised concerns about the impacts of development on Junction 14 of the M5 ('J14') and requests that further work is undertaken to understand detailed proposals for mitigation and an approach to a comprehensive solution that includes joint-working and developer contributions.

National Highways requested that Policies PS24, PS34, PS36 and PS37 are strengthened to explicitly reference the need for improvements at J14 in line with those identified in the TFR and IDP.

The consultation response from SGC requests further clarification on the evidence base to inform the allocation of the sites and requests that for those three sites that a robust Transport Assessment and Travel Plan is provided, and SGC consulted at the earliest opportunity.

The position set out in the latest version of the Statement of Common Ground with National Highways and SGC is:

"The parties agree to work together to develop any further transport evidence required to accompany the Stroud District Local Plan during examination". SoCG with SGC (dated October 2021) and SoCG with National Highways (dated October 2021).

The Aecom Mitigation Review identifies a scheme of improvement at J14 including a new grade-separated junction and signalised approach lanes. Other connected schemes identified within the LTP and TFR include

the A38 / B4509 junction, and both the southern and northern junctions of the B4509 / Tortworth Road (south).

The Funding and Delivery Plan estimates that the cost of the Junction 14 package of improvements would total £27.3m. When considering economic growth and the amount of development occurring in neighbouring authorities, it is anticipated that Stroud Local Plan Review growth would account for 20% of the impact on the Junction 14 package.

It is expected that the following Strategic and Local Site Allocations would contribute towards the delivery of this package:

- PS34 - Sharpness Docks
- PS36 - New Settlement at Sharpness
- PS37 - New Settlement at Wisloe
- PS47 – Land West of Renishaw New Mills

Apportioned costs from the Funding and Delivery Plan for the Strategic Site Allocations are included within Appendix A.

2.1.2 Local Road Network

A38 Corridor Package

The Aecom Mitigation Review identifies six schemes which are included within the TFR and the LTP as being a potential package of improvements to address growth at Strategic Site Allocations within the Local Plan Review. It is expected that the following Strategic and Local Site Allocations would contribute towards this scheme:

- PS19a - Northwest of Stonehouse
- PS20 – EcoPark M5 J13
- PS24 - West of Draycott
- PS25 - East of River Cam
- PS33 - Northwest of Berkeley
- PS45 - Land west of Upton's Gardens
- PS46 - Land west of School Lane
- PS44 - Northwest of Whitmister Lane
- PS34 - Sharpness Docks
- PS35 - Land at Focus School
- PS36 - New Settlement at Sharpness
- PS37 - New Settlement at Wisloe

The cost of the A38 mitigation package is expected to be £3.8m, and would include the A38 junctions with Grove Lane, the B4066, B4066 Berkeley Road, Alkington Lane and the A3135, as well as at the A38 at Claypits.

The Funding and Delivery Plan has sought to refine the impacts on the A38 Corridor through an understanding of the traffic modelling for the Local Plan Growth. It is expected that Stroud Local Plan Review growth would account for 60% of the impact on the A38 and associated junctions.

It is expected that the following Strategic Site Allocations would result in impacts and should therefore contribute towards the package of improvements proposed:

- PS24 - West of Draycott
- PS25 - East of River Cam
- PS30 - Hunts Grove Extension
- PS34 - Sharpness Docks
- PS36 - New Settlement at Sharpness
- PS37 - New Settlement at Wisloe

Apportioned costs from the Funding and Delivery Plan for the A38 package relevant to the Strategic Site Allocations are included within Appendix A.

Other junction improvements

The Aecom Mitigation Review identifies the following schemes as being required to respond to the growth set out within the Stroud Local Plan Review. The table sets out the mitigation proposed, where it was identified as being needed, the relevant associated schemes and Strategic Site Allocations and Local Development Sites which would be expected to contribute towards a package.

These schemes are not being progressed to the Funding and Delivery Plan, and justification is included within the table below. This is typically either due to their lower cost, the fact that development within another district is likely to mean the scheme is reliant on funding from elsewhere or that an alternative to a highway capacity scheme is to be considered.

Apportioned costs for these schemes are provided within Appendix A. The approach to apportionment follows the same methodology as taken in the 2021 IDP. This relies upon the following, per unit costs for each scheme.

- Half of mid-point cost of transport scheme from the LTP or TFR / Total Allocated Housing Numbers within the Cluster = Cost per unit
- Cost per unit x Number of units = Cost of contribution towards transport scheme per site

Table 1: Highway Mitigation extract from Aecom Mitigation Review

Mitigation Location	Mitigation Scheme	Scheme Included in:			Scheme Strategic Level	Interdependent / Associated Schemes	Associated LP Development Site(s)	Recommend Changes to Mitigation Strategy	Next Design / Implementation Steps	Estimated Cost
		TFR	LTP	STS						
A38 / Epney Road	Junction improvement: A38 approaches widened to include 2 ahead lanes and 1 RT lane. Signal optimisation	X			Major	4 - St Barnabas Roundabout 8 - A38 / A430 / B4008 Cole Av.	G2 - Land at Whaddon G1 - South of Hardwicke PS30 - Hunts Grove Expansion	Alteration Amend to be a contribution towards a GCT-led scheme. SDC to promote active travel / PT to mitigate local plan impact. Include scheme in LP IDP, not the F&D plan.	GCT to lead on delivery.	£625,000
St Barnabas Roundabout	Junction improvement: All approaches widened by 1 lane. Circulatory widened to 3 lanes	X			Major	3 - A38 / Epney Road 8 - A38 / A430 / B4008 Cole Av.	G2 - Land at Whaddon	Alteration Amend to be a contribution towards a GCT-led scheme. SDC to promote active travel / PT to mitigate local plan impact.	Developer to review mitigation options, including sustainable travel mode approach. Concept design and modelling stage. Land availability check	£3,125,000
B4008 / A38 NB Off-Slip	Junction improvement: Signals optimisation	X			Local	1 - Cross Keys Roundabout	G1 - South of Hardwicke PS30 - Hunts Grove Extension	Alteration Recommend that alternative to highway capacity scheme to be considered.	Alternative schemes to be considered and designed. Costs unlikely to be realistic.	N/A
A38 / A430 / B4008 Cole Avenue	Junction improvement: Signals optimisation A430 approach widened to 3 ahead lanes A38 EB approach nearside flare length increase. A38 WB approach widened to 2 lanes for LTs.	X			Major	3 - A38 / Epney Road 4 - St Barnabas Roundabout	G2 - Land at Whaddon G1 - South of Hardwicke PS30 - Hunts Grove Expansion	Alteration Amend to be a contribution towards a GCT-led scheme. SDC to promote active travel / PT to mitigate local plan impact.	GCT to lead on delivery.	£3,125,000

Mitigation Location	Mitigation Scheme	Scheme Included in:			Scheme Strategic Level	Interdependent / Associated Schemes	Associated LP Development Site(s)	Recommend Changes to Mitigation Strategy	Next Design / Implementation Steps	Estimated Cost
		TFR	LTP	STS						
								Include scheme in LP IDP, not the F&D plan.		
A419 at Stonehouse	Highway improvement: A419 widened to 2 lanes between Oldends and Chipmans Platt roundabouts <i>[Part of GLTP / STS A419 corridor improvements]</i>	X	X	X	Major	13 - A419 / Boakes Dr RBT 11 - M5 J13 31 - M5 J13 P&R 61 - Eastington to Chalford ATR	PS17 - Magpies Site PS19a - Northwest of Stonehouse PS20 – Eco Park M5 J13	Alteration Recommend that alternative to highway capacity scheme to be considered.	Concept Design / Modelling. Investigation of land availability. Investigation of alternatives.	£3,125,000
A419 / Boakes Drive	Junction improvement: A419 approaches widened to 3 lanes <i>[Part of GLTP / STS A419 corridor improvements]</i>	X	X	X	Major	12 - A419 at Stonehouse 61 - Eastington to Chalford ATR	PS16 - South of Leonard Stanley Primary School PS17 - Magpies Site PS19a - Northwest of Stonehouse PS20 – EcoPark M5 J13 PS42 - Land of Dozule Close	Alteration Recommend that alternative to highway capacity scheme to be considered.	Concept Design / Modelling. Investigation of land availability.	£62,500
A46 / Dudridge Hill	Junction improvement: Signals optimisation Dudridge Hill approach widened to 3 lanes	X			Major	37 - NCR 45	PS10 - Railway Land / Car Parks PS11 - Merrywalks Arches PS12 - Police Station / Magistrates Court STR065 - Beeches Green	Alteration Recommend that alternative to highway capacity scheme to be considered.	Concept Design / Modelling. Investigation of land availability. Investigation of alternatives.	£625,000

Mitigation Location	Mitigation Scheme	Scheme Included in:			Scheme Strategic Level	Interdependent / Associated Schemes	Associated LP Development Site(s)	Recommend Changes to Mitigation Strategy	Next Design / Implementation Steps	Estimated Cost
		TFR	LTP	STS						
B4066 / Station Road	Junction improvement: B4066 approach widening <i>[Part of GLTP B4066 Highway Corridor Improvements]</i>	X	X	X	Major	17 - A38 / B4066 21 - A38 / Alkington Lane 29 - B4066 / Alkington Lane	PS33 - Northwest of Berkeley PS34 - Sharpness Docks PS35 - Land at Focus School PS36 - New Settlement at Sharpness PS37 - New Settlement at Wisloe BER16/17 - Land at Lynch Road	Retain	Developer to review of mitigation options, including sustainable travel. Concept design and modelling stage. Land availability check	£62,500
B4066 / Alkington Lane	Junction improvement: Signalisation	X	X	X	Major	21 - A38 / Alkington Lane 22 - B4066 / Station Road 17 - A38 / B4066	PS33 - Northwest of Berkeley PS34 - Sharpness Docks PS35 - Land at Focus School PS36 - New Settlement at Sharpness PS37 - New Settlement at Wisloe BER16/17 - Land at Lynch Road	Retain	Concept Design / Modelling. Investigation of land availability.	£664,352

2.1.3 Rail

Stonehouse Bristol Road Station

In October 2021 the Minister of State for Transport confirmed that the Restoring Your Railway Ideas Fund bid had been approved for the proposal to re-open Stroudwater Station, Bristol Road, Stonehouse. Whilst Stonehouse currently has a station, it is located off the Bristol to Gloucester trainline and requires a change to reach the former destination.

Stroud District Council has commissioned consultants to develop a Strategic Outline Business Case for the proposal and is liaising with Network Rail to undertake a rail capacity analysis to greater understand the scope for a new station at Bristol Road.

Sharpness Station and reopening the Sharpness Branch Line

In addition to the concerns raised by GCC in relation to the impacts of developments in Sharpness/Berkeley (PS34/PS36) on the road network, there were also concerns about the feasibility of reopening the Sharpness Branch Line and the reliance upon this in terms of mode share within the applicant's assessments.

Network Rail has provided a copy of its response to Sharpness Development LLP (the applicant for Sharpness Garden Village) in relation to the Sharpness Branch Line Study which was completed in October 2020. The following key points were made within the Network Rail response:

- The scope of the Study and the assumptions used are acceptable.
- There are important omissions and potential developments that would need to be factored into further timetable analysis:
 - Operation of the existing freight service on the branch line, where additional infrastructure may be required to develop an acceptable solution.
 - The timetable base used took account of committed enhancements to services, but rightly did not take account of potential future mainline service enhancements. As these develop further analysis will need to account for them.
- A cost well into the tens of millions of pounds to reinstate the Branch Line is expected.
- A two trains per hour service would require infrastructure interventions at Gloucester Station, again at substantial cost.
- A strategic and economic case must be developed for the proposed scheme. Consideration should also be given to the operation of services and engagement with a train operating company is required.

2.2 Education

This section seeks to update the assessment undertaken within the June 2021 version of the Stroud IDP. An update is undertaken on the basis of the following key issues:

- GCC Education has published an Interim Statement on Pupil Product Ratios (PPR)⁴ following receipt of the planning appeal decision APP/G1630/W/20/3257625⁵. This appeal determined that the effects of the proposed development would be acceptable without any provision for expanded education facilities, contrary to the recommendations of GCC Education.
- GCC Education has embarked on a review of its PPRs following the publication of the Interim Statement to calculate demands for school places arising from developments more effectively.
- GCC Education has provided a response to the Pre-submission Draft Local Plan Review consultation, providing comments on likely educational infrastructure demands for relevant sites.

2.2.1 PPR Review

GCC Education has commissioned a review of the PPRs used to calculate future demands for school places arising from new residential development. Correspondence with GCC Education in March 2022 set out that the PPR Review process is split into three key stages:

- **Stage 1** – Reviews GCC existing methodologies for calculating PPRs and the base data supporting those assumptions. It is assumed a revised approach is required in light of national best practice and recent Planning Inquires. It is accepted that new data is required to supplement the existing data to better represent the county. It is estimated that this will take approximately 4 weeks to complete.
- **Stage 2** – Includes applying the agreed recommendations from stage 1 linked to undertaking the additional data collection requirements and applying the proposed PPR methodology. It is estimated that this will take approximately 12 weeks to complete,
- **Stage 3** – Covers the production of new policy to incorporate the outputs from Stage 2 including the management of a consultation with key stakeholders. It is estimated that this will take approximately 10 weeks to complete.

Arup met with GCC Education on the 24th May 2022 to discuss the progress made with the PPR review and the education infrastructure requirements identified in the Stroud District Council Local Plan Review.

GCC Education confirmed that Stage 1 of the work, which entails creating a baseline of national best practice, recent Planning Inquires and the GCC existing methodologies for calculating PPRs, was due to complete by the end of April but had been delayed and would now continue to June.

Once Stage 1 is complete, Stage 2 will include the collection of primary data to identify the rates of school places arising from new developments. Because of the school year, data must be collected in June and July, and a strategy drawn up.

It is expected that data is to be processed over the summer, to then inform a revised PPR rate in the autumn. This revised rate will be published within an updated version of the Local Development Guide (GCC) and would be consulted upon, most likely in Autumn 2022.

It was advised that until the review had been completed, the PPRs from the Interim Position Statement (published June 2021) should be used to calculate need.

⁴ Gloucestershire County Council (2021) Interim Statement on Pupil Product Ratios <https://www.gloucestershire.gov.uk/media/2108092/gcc-interim-position-statement-final.pdf>

⁵ For Land Off the A38, Coombe Hill, Gloucestershire.

2.2.2 Pre-submission Draft Local Plan Review consultation and Interim PPRs

At the meeting with GCC Education on the 24th May 2022, it was confirmed that GCC's position in respect of the infrastructure requirements for the Strategic Site Allocations has not changed since its response to the Pre-submission Version Plan consultation undertaken in Autumn 2021.

The PPRs and costs per pupil place set out within the consultation responses are based upon the Interim Statement on PPRs, which are as follows:

Table 2: Pupil Product Ratios & Costs

Phase of education	PPRs per 100 dwellings		Costs per pupil	
	Interim PPR (June 2021)	Former PPR (IDP 2020)	Interim Cost (June 2021)	Former Cost (IDP 2020)
Pre-school (early years)	0	30	N/A	£15,091
Primary	38.5	41	£14,954	£15,091
Secondary	17	20	£19,312	£19,490
Post-16	6	11	£22,803	£23,012

The Interim Statement sets out that a reduction has been applied to each of the PPRs to account for those students who attend independent schools or are home-schooled. A further discount is applied to account for vacant homes and second homes. No amendments were made to account for the fact that household formation may include children already in attendance within Gloucestershire Schools as there was not enough data. At this interim stage, no pre-school contributions are to be sought.

The adjustment to the PPRs set out in the Interim Statement results in the following adjustments in terms of demands and costs for all Site Allocations (both Strategic and Local) proposed within the Stroud Local Plan Review.

Table 3: Demands & Costs for Education in Stroud

Phase of education	Interim PPR (June 2021)		Former PPR (IDP 2020)	
	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)
Pre-school (early years)	0	0	3,620	£54,621,875
Primary	4,645	£69,461,704	4,947	£74,649,895
Secondary	2,051	£39,609,878	2,413	£55,720,996
Post-16	724	£16,507,092	1,327	£30,646,548
Total	7,420	£125,578,673	12,306	£215,639,313

As a result of the adjustments made to the PPRs and the removal of the request for pre-school contributions, at this stage, the overall demands for school places would reduce to 7,420 from 12,306 places at a cost of £126m. The costs shown are index-linked and subject to change over time.

Full details of the site-by-site infrastructure requirements for education are set out within Section 3 of this report.

2.2.3 Sensitivity testing

Within the June 2021 version of the IDP, sensitivity testing of the PPR's was undertaken based on the School Census (GCC, 2021⁶) and the Current Population of Gloucestershire (GCC, 2019⁷). This concluded that the demand for places was as per the right-hand column below.

Table 4: Demands & Costs for Education (Sensitivity testing based on population data)

Phase of education	Interim PPR (June 2021)		Population data ratio (IDP 2021)	
	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)
Pre-school (early years)	0	0	2,098	£31,662,480
Primary	4,645	£69,461,704	2,098	£31,662,480
Secondary	2,051	£39,609,878	1,786	£41,247,467
Post-16	724	£16,507,092	1,327	£30,646,548
Total	7,420	£125,578,673	7,309	£135,218,975

The above table demonstrates consistently with the June 2021 version of the IDP that the GCC Interim PPRs still assume much higher than existing school populations in the future, with a similar demand and cost shown between the two calculations despite no assessment being made for pre-school places within the Interim PPRs.

2.2.4 Conclusions

In absence of an up-to-date evidence backed method to assess pupil demand arising from new development, it is recommended that the education demands arising from each application for those sites proposed to be allocated within the Local Plan Review is assessed on a case-by-case basis. When assessing education demand, consideration should be given to the following:

- The Interim PPRs and the sensitivity testing set out in this IDP
- Any PPR that may supersede the above following
- The capacity of existing schools that will serve development, taking account of pupil migration within the district and across planning areas
- Alternative sources of funding that may be available
- The extent to which developer contributions are required and whether they can be secured at an appropriate time.

This approach is consistent with the Department for Education guidance, '*Securing developer contributions for Education*⁸', which sets out principles for how education need and demand is assessed in plan and decision-making.

⁶ Gloucestershire County Council (2021) School Census Spring-January. Available: <https://www.gloucestershire.gov.uk/education-and-learning/school-admissions-scheme-criteria-and-protocol/pupil-numbers-in-gloucestershire-schools/>

⁷ Gloucestershire County Council (2019) Current Population of Gloucestershire (Mid-2019) – An Overview. Available: <https://inform.gloucestershire.gov.uk/media/2099157/current-population-of-gloucestershire-overview-2019.pdf>

⁸ Department for Education (2019) Securing developer contributions for Education. Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/909908/Developer_Contributions_Guidance_update_Nov2019.pdf

2.3 Open Space, Green Infrastructure and Biodiversity

This section seeks to update the assessment undertaken within the June 2021 version of the Stroud IDP. An update is undertaken on the basis of the following key issues:

- Representations have been made to the Pre-submission Draft Local Plan Review relevant to GI and biodiversity by developers and statutory consultees.
- The Environment Act achieved royal assent in November 2021, establishing the principles of Biodiversity Net Gain (BNG), setting targets for air quality, biodiversity, water and waste recovery; establishing the Office for Environmental Protection; developing principles for Local Nature Recovery Strategies and increasing standards for water and resource efficiency.
- The Gloucestershire Local Nature Partnership (GLNP) has published its Natural Capital mapping project⁹ which shows the extent of nature recovery networks and other biodiversity and landscape features across Gloucestershire.
- A Strategic Framework for Green Infrastructure in Gloucestershire has been published in draft form by the GLNP.
- The Cotswolds Beechwoods SAC Recreation Mitigation Strategy has been published in draft form.
- The Rodborough Common Recreation Mitigation Strategy has been published in draft form.
- An update to the Severn Estuary Recreation Mitigation Strategy has been commissioned.

2.3.1 Biodiversity Net Gain

The National Planning Policy Framework (paras. 174 and 179) set out that planning policies and decisions should seek to minimise impacts upon biodiversity and seek to provide net gains for biodiversity.

The Environment Act legislates for the provision of biodiversity gain to be a condition of planning permission in England. Schedule 7A of the Act establishes the target of requiring a 10% gain in biodiversity above existing levels on developments.

It is expected that biodiversity net gain regulations will be drafted to set out how the new regime will be applied and operated, and a DEFRA consultation was undertaken between January and April 2022 on their scope. The requirement to provide 10% biodiversity net gain is likely to apply to new applications from November 2023.

Applicants should undertake an assessment of baseline habitats, utilising the Biodiversity Metric 3.1 or any subsequent versions ('the Metric') to establish the number of 'units' of habitat that exist on sites prior to any development occurring. Applicants should then demonstrate that there would be a net gain of biodiversity onsite using the Metric and deliver new or improved wildlife habitats onsite.

Gloucestershire Nature and Climate Fund

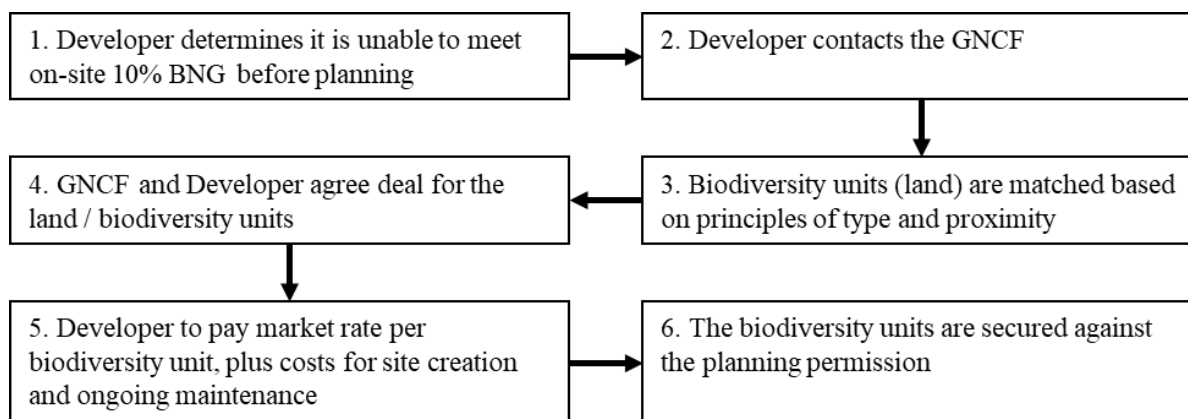
The GLNP is working in partnership with Gfirst LEP to establish a Gloucestershire Nature and Climate Fund (GNCF) to administer the new Biodiversity Net Gain legislation.

Where the required 10% Biodiversity Net Gain (BNG) cannot be delivered on site, the option of delivering new or improved habitat (and other environmental measures) off-site comes into play. The GNCF will take responsibility for parts of the process such as establishing available BNG units, site design, brokering sales and registration. This would then facilitate a local option for developers to buy BNG units.

The fund is currently under design and establishment, but it is anticipated to be in place in time for the implementation of the BNG requirements for new planning applications from November 2023.

⁹ GLNP (2022) Natural Capital mapping project. Available: <https://naturalcapital.gcerdata.com/>

The process is anticipated to work as follows:



The GNCF is currently briefing the Gloucestershire Authorities, including Strategic Directors, Planning Officers, Councillors and Members with the aim of agreeing a memorandum of understanding to establish joint-working and a county-wide approach. It is also asking local authorities to identify sites that could be utilised to provide off-site BNG.

2.3.2 Nature Recovery Networks and Natural Capital

The Gloucestershire Natural Capital Mapping Project is managed by GLNP in collaboration with the Gloucestershire local authorities and the GFirst Local Enterprise Partnership.

The mapping includes details of green infrastructure, designated sites such as Areas of Outstanding Natural Beauty, biodiversity habitats and other ecosystems in a series of layers. The information relies upon survey data from bodies such as Gloucestershire Wildlife Trust, the Gloucestershire Centre for Environmental Records and the Gloucestershire Tree Strategy Map and other useful reference layers.

The Mapping is available via the link below and should be used to inform site assessments for development within Stroud District.

- <https://naturalcapital.gcerdata.com/>

2.3.3 Strategic Framework for Green Infrastructure

The Strategic Framework is a document produced by the GLNP to form part of the evidence base for Local Plan, strategy production and a wide variety of projects.

The Strategic Framework was originally published by the GLNP in 2015 and has been updated to embed the concepts of natural capital, the nature recovery network and net gain. The first edition was used on to support the examination and adoption of a number of Local Plans, including the 2015 version of the Stroud District Local Plan.

As well as the above concepts, it establishes principles for green infrastructure, in accordance with Natural England’s GI Framework¹⁰, and states that natural greenspace should be accessible for new communities. These principles should be used to inform development proposals within Stroud.

2.3.4 Recreation Mitigation Strategies

The 2021 IDP set out that there were two mitigation strategies in place to manage and mitigate recreational impacts arising from new development on designated sites. These included the Severn Estuary SAC/SPA/Ramsar site and the Rodborough Common SAC. These strategies defined ‘Core Catchments’, within which developers are required to contribute towards mitigating potential adverse effects. These rates were applied to developments on a per unit basis for those developments where suitable alternative provision was not provided onsite.

¹⁰ <https://designatedsites.naturalengland.org.uk/GreenInfrastructure/Home.aspx>

The IDP highlighted that the existing mitigation strategies for Rodborough Common and the Severn Estuary should be reviewed to ensure that they are effective, whilst an additional mitigation strategy was required for the Cotswold Beechwoods to implement similar measures to address recreational impacts.

Cotswold Beechwoods SAC Recreation Mitigation Strategy

This mitigation strategy has been produced by Footprint Ecology on behalf of Stroud District Council and in collaboration with other Gloucestershire authorities. The strategy was published in draft form in January 2022.

It seeks to provide a framework under which applications for development likely to have a significant effect on the Cotswolds Beechwoods SAC can be permitted, provided sufficient mitigation can be put in place to ensure adverse effects on the SAC can be avoided.

The strategy identifies a ‘zone of influence’ of 15.4km from the SAC, which represents the area where new development could result in recreational pressures on the SAC. This zone of influence includes all development locations to the north of Cam and Dursley and to the east of the Berkeley Cluster.

Within this area, all new residential development will be expected to provide mitigation. This is likely to come in the following forms:

- Strategic Access Management and Monitoring (SAMM), which relates to managing access and engaging with visitors at the SAC.
- Suitable Natural Alternative Greenspace (SANG), through the creation of or improvements to existing greenspace sites. This is to encourage recreational use of open spaces away from the SAC.

It is estimated that the costs for implementing the SAMM would be £187.00 per dwelling. This would be exclusive of any administration fee and adjustment for inflation. This payment will be secured via planning obligations.

The following site allocations will be subject to the following costs on the basis of the Strategy:

Table 5: Cotswold Beechwoods SAMM Costs

Ref	Site Allocation	Ward Cluster	Housing Delivery to 2040	Population	SAMM Contribution Cost (£)
PS19a	Stonehouse North West	Stonehouse Cluster	700	1645	£130,900
PS16 & PS42	Leonard Stanley	Stonehouse Cluster	40	94	£7,480
PS17	Stonehouse	Stonehouse Cluster	10	24	£1,870
PS01 & PS02	Brimscombe & Thrupp	Stroud Valleys	190	447	£35,530
PS05	Minchinhampton	Stroud Valleys	80	188	£14,960
PS06 & PS07	Nailsworth	Stroud Valleys	90	212	£16,830
PS10, PS11, PS12 & PS13	Stroud	Stroud Valleys	165	388	£30,855
PS41	Painswick	The Cotswold Cluster	20	47	£3,740
G1	South of Hardwicke	The Gloucester Fringe	1350	3173	£252,450
PS30	Hunts Grove Extension	The Gloucester Fringe	750	1763	£140,250
HAR017	Hardwicke	The Gloucester Fringe	10	24	£1,870
G2	Land at Whaddon	The Gloucester Fringe	3000	7050	£561,000
PS38	Kingswood	The Wotton Cluster	50	118	£9,350
Total			6,455	15,173	£1,207,085

Where applicable, costs have been included for Strategic Site Allocations within Section 3.

It is proposed that the final version of the mitigation strategy will be made available for adoption by the local authorities by Summer 2022.

Rodborough Common SAC Recreation Mitigation Strategy

Similar to the Cotswold Beechwoods SAC Recreation Mitigation Strategy, this strategy seeks to provide a framework for the management of recreational pressures arising from new development for Rodborough Common SAC, which is located to the south of Stroud town. This strategy was published in draft in February 2022 and builds on the existing strategy which was adopted in March 2015.

Given that the zone of influence is small and as a consequence there is a limited geographic area within which to find and provide suitably large SANGs, the strategy proposes a £949.00 per dwelling payment to implement SAMM mitigation. The mitigation costs include in-perpetuity funding and a 10% contingency. They do not allow for inflation or discounting and do not include an administration fee.

The following Local Site Allocations will be subject to the following costs on the basis of the Strategy:

Table 6 Rodborough Common SAMM Costs

Ref	Site Allocation	Ward Cluster	Housing Delivery to 2040	Population	SAMM Contribution Cost (£)
PS01 & PS02	Brimscombe & Thrupp	Stroud Valleys	190	447	£180,310
PS05	Minchinhampton	Stroud Valleys	80	188	£75,920
PS06 & PS07	Nailsworth	Stroud Valleys	90	212	£85,410
PS10, PS11, PS12 & PS13	Stroud	Stroud Valleys	165	388	£156,585
Total			525	1,235	£498,225

There are no Strategic Site Allocations within the zone of influence and therefore no costs have been provided within Section 3.

It is proposed that the final version of the mitigation strategy will be made available for adoption by the local authorities by Summer 2022.

Severn Estuary Recreation & Mitigation Strategy

Work is being undertaken to update the Recreation & Mitigation Strategy for the Severn Estuary SAC, SPA and Ramsar, which was adopted in December 2017.

Visitor surveys are currently being undertaken to determine a zone of influence for recreational pressures. It is anticipated that the strategy will be adopted by December 2022. Until that time, the existing Recreation & Mitigation Strategy should be used to determine whether a development would have impacts upon the Severn Estuary. The cost of £385.00 per dwelling (subject to inflation and administrative costs) should be applied to development within the zone of influence to contribution towards suitable mitigation.

3. Strategic Site Allocations

3.1 Introduction

To provide clarity over infrastructure requirements for each of the eight strategic site allocations plus the site at Whaddon, which is proposed to be safeguarded, this section provides a site-by-site summary of infrastructure requirements. This is restructured from the topic-by-topic assessment presented by sub-area in the 2021 update. This section also includes the updated information set out within Section 2 of this Addendum and incorporates it into site-specific sections.

The remainder of this section is structured by site, as per the order set out in the Pre-submission version of the Plan¹¹. Page 306 of the Plan set out the following trajectory:

Table 7: Housing Trajectory for Strategic Site Allocations

Ref.	Source of housing supply	Projected delivery				Total supply
		2020-2025	2025-2030	2030-2035	2035-2040	
PS24	Cam North West	200	700			900
PS25	Cam North East Extension		50	130		180
PS30	Hunts Grove Extension	166	550	34		750
PS34	Sharpness Docks	110	112	78		300
PS36	Sharpness		500	750	1,150	2400
PS19a	Stonehouse North West	100	375	225		700
G1	South of Hardwicke		600	600	150	1350
PS37	Wisloe	50	565	660	225	1500
G2	Whaddon	TBC	TBC	TBC	TBC	3000
n/a	Local Development Sites	116	290	290	289	985
Total		742	3742	2767	1814	12065

Source: Pre-Submission Draft Local Plan Review for Publication 2021

¹¹ Stroud District Council (2021) Local Plan Review: Pre-submission Draft Local Plan. Available: <https://www.stroud.gov.uk/environment/planning-and-building-control/planning-strategy/stroud-district-local-plan-review/local-plan-review-pre-submission-draft-local-plan-regulation-19-consultation-may-2021>

3.2 Cam North West (PS24)

3.2.1 Transport and Highways

One pinch-point has been identified in the TFR within the Cam & Dursley cluster related to the Cam North West allocation at the A38 / A4135.

The northbound approach on the A38 at the A38 / A4135 junction is expected to exceed capacity in the AM peak and exceed capacity at the PM peak.

Highway mitigation in the form of a widened A38 approach is considered feasible and forms the preferred highway mitigation. It is expected that the proposed allocation at PS24 West of Draycott would contribute towards the delivery of this mitigation via s.106 agreement.

The Aecom Mitigation Review identifies that it may be appropriate to collect planning obligations for eight schemes identified within either the TFR, LTP or Sustainable Transport Strategy. These are listed within Appendix A.

The Aecom Funding and Delivery Plan identifies that it may be appropriate to secure contributions towards the A38 package of mitigation from development at the Cam North West site.

The LTP highlights that there is potential to create an attractive sustainable transport hub using existing and enhanced public transport, walking and cycling at the North West Cam strategic development site. Contributions to these projects may be sought as part of this allocation.

A bid to the DfT Local Pinch Point Fund has been made by GCC to undertake feasibility work to support the delivery of the Cam, Dursley and Uley Greenway in the Cam and Dursley Cluster. Contributions may also be sought from this proposed development towards the Greenway and other active travel schemes in the cluster.

3.2.2 Flood Risk Management and Drainage

This proposed site allocation is not assessed with Appendix O of the Level 2 SFRA as being at risk of flooding. It is expected that development on site will be sequentially located within Flood Zone 1.

It is expected that applications on this site provide a site-specific flood risk assessment. Developers must accord with the drainage hierarchy, creating flood storage where appropriate and implement measures to ensure that surface water is not increased onsite or elsewhere.

3.2.3 Education

GCC Education has identified that the strategic development site at North West Cam would create the need for a new two form of entry primary school. Developer contributions via s.106 agreement would be required to address additional demand for secondary education.

The Interim PPRs estimated the following demands and costs would arise from development at Cam North West.

Table 8: Education demands and costs for Cam North West

Primary		Secondary		Post-16		Site Totals	
Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)
346.5	£5,181,561	153	£2,954,736	54	£1,231,362	554	£9,367,659

3.2.4 Health and Social Care

The 2021 IDP sets out that the scale of development at North West Cam is likely to be sufficient to warrant the need for a new doctor's surgery, with over 200sqm of new surgery space required at a cost of £846,000.

If a surgery wasn't to be provided, the Gloucestershire Clinical Commissioning Group (CCG) Primary Care Infrastructure Plan outlines that development options are being explored to expand the Cam & Uley Family Practice. The development options include the possible expansion of premises at the existing site, together

with associated facilities such as parking. The practice has been in contact with CCG around potential funding mechanisms.

It may be appropriate to utilise developer contributions (monies, buildings or land) secured via s.106 agreement towards either of these projects.

3.2.5 Open Space, Green Infrastructure and Biodiversity

The North West of Cam strategic development site will provide onsite open space and green infrastructure, including a strategic landscape buffer along the western edge of the site.

Further details of the likely Open Space and Green Infrastructure requirements are included in Table 17 – Cam North West Projects.

3.3 Cam North East Extension (PS25)

3.3.1 Transport and Highways

A pinch-point at the A38 / A4135 junction has been identified in the Transport Modelling within the Cam & Dursley cluster, related to development at Cam North East Extension. It is expected that the northbound approach on the A38 at the A38 / A4135 junction will exceed capacity in the AM peak and the PM peak.

Highway mitigation is proposed in the Transport Modelling Report in the form of a widened A38 approach. It is expected that the proposed allocation at PS25 Cam North East Extension (East of River Cam) would contribute towards the delivery of this mitigation via s.106 agreement.

The Aecom Mitigation Review identifies that it may be appropriate to collect planning obligations for eight schemes identified within either the TFR, LTP or Sustainable Transport Strategy. These are listed within Appendix A.

The Aecom Funding and Delivery Plan identifies that it may be appropriate to secure contributions from the Cam North East Extension site towards the Junction 12 package of mitigation.

The LTP highlights that there is potential to create an attractive sustainable transport hub using existing and enhanced public transport, walking and cycling at the North West Cam strategic development site. Contributions to these projects may be sought as part of this allocation.

A bid to the DfT Local Pinch Point Fund has been made by GCC to undertake feasibility work to support the delivery of the Cam, Dursley and Uley Greenway in the Cam and Dursley Cluster. Contributions may also be sought from this proposed development towards the Greenway and other active travel schemes in the cluster.

3.3.2 Flood Risk Management and Drainage

The River Cam flows along the eastern boundary of the proposed site.

Whilst there are no recorded flood incidents on the site, there were some incidents of sewer flooding in proximity of the site in 2004, 2006 and 2007.

A small part (2%) of the site in the south western corner is within the functional flood plain. Two small surface water flow paths cross the centre and northern edge of the site in a westerly direction during the 1 in 1,000-year event, before entering the River Cam. The site is not at risk of groundwater, reservoir or canal flooding. The LLFA has set out there are no existing assets on the s.21 asset register, and currently no plans for future schemes on the site.

It is anticipated that proposed development will be sequentially located within Flood Zone 1 and the site must satisfy the exception test. A site-specific flood risk assessment and surface water drainage strategy will be required to support any future planning application.

If the proposed development intends to discharge to the Cam, evidence of any necessary agreement for works on third party land will be required. The site should drain during high flows, when the Cam is in flood, and any storage features should not be located in Flood Zone 3.

Discussions with the Environment Agency have been undertaken with regards to the design of the access bridge and it is considered that a realistic developable area can be defined to the well-defined flood plain extents defined by hydraulic modelling.

3.3.3 Education

GCC Education states that the application of up to 180 dwellings at North East Cam is expected to provide a contribution towards additional primary school places in the area, however there are limited options to expand Dursley C of E Primary Academy following its recent expansion. Developer contributions via s.106 agreement would be required to address additional demand for secondary education.

The Interim PPRs estimated the following demands and costs would arise from development at Cam North East Extension.

Table 9: Education demands and costs for Cam North East Extension

Primary		Secondary		Post-16		Site Totals	
Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)
69.3	£1,036,312	30.6	£590,947	11	£246,272	111	£1,873,532

3.3.4 Health and Social Care

The 2021 IDP sets out that the scale of development at North East Cam is likely to create demand for 42sqm of doctor’s surgery space at a cost of £148,050.

Developer contributions from this development could be used to expand the Cam & Uley Family Practice, as identified in the Primary Care Infrastructure Plan.

3.3.5 Open Space, Green Infrastructure and Biodiversity

The North East of Cam strategic development site will provide accessible natural green space providing a net gain to biodiversity (including management and disposal of surface water, including sustainable drainage systems (SuDS) with biodiversity benefits)) and public outdoor playing space in accordance with local standards. Structural landscaping buffer along the eastern boundary incorporating existing and new native hedgerows and trees and linking with existing green infrastructure; linked to a layout which prioritises walking and cycling and access over the use of the private car.

3.4 Hunts Grove Extension (PS30)

3.4.1 Transport and Highways

The transport model shows that a total of eight pinch-points are located on the highway network close to the Hunts Grove extension.

This includes Junction 12 of the M5, which is likely to be operating at capacity, with pinch-points identified at the B4008 entries and the northbound on-slip. Highway mitigation has been tested in the form of a new all-movements grade-separated junction incorporating two overbridges. This scheme is in its infancy and further work will be required to determine its appropriateness in collaboration with National Highways and other developers within the Gloucester Fringe area of the Local Plan.

Impacts are also anticipated at the Cross Keys roundabout, the A38 / Epney Road junction within Gloucester; the A38 Bristol Road / B4008 Bath Road junction and the A38 / A430 / B4008 Cole Avenue. It is likely that contributions will be sought via s.106 agreement from the proposed development, as well as other proposed allocations, infill and redevelopment sites in the Gloucester Fringe.

The Aecom Mitigation Review identifies that it may be appropriate to collect planning obligations for five schemes identified within either the TFR, LTP or Sustainable Transport Strategy. These are listed within Appendix A.

The Aecom Funding and Delivery Plan identifies that it may be appropriate to secure contributions from applications on this site towards the Junction 12 package of mitigation.

Given that a number of the highway mitigation locations are within Gloucester, a statement of common ground should be prepared with GCC and/or the JCS Authorities.

A Funding and Delivery Plan is to be produced by Aecom on behalf of Stroud District Council to enable greater understanding of the potential to deliver a comprehensive package of improvements at Junction 12.

Land at Naas Lane on the Hunts Grove strategic development site, allocated in the 2015 Local Plan, was safeguarded as a location for a potential new railway station. A capacity study, to be undertaken by Network Rail, would need to be commissioned by the developer to determine whether a new station could be accommodated without adversely affecting the existing rail line. It may be appropriate for the Hunts Grove Extension to contribute towards this potential new railway station.

This site should seek to provide active travel routes to the Gloucester and Sharpness Canal to the west and contributions may be sought for off-site connections to these routes.

3.4.2 Flood Risk Management and Drainage

This proposed site allocation is not assessed with Appendix O of the Level 2 SFRA as being at risk of flooding. It is expected that development on site will be sequentially located within Flood Zone 1.

It is expected that applications on this site provide a site-specific flood risk assessment. Developers must accord with the drainage hierarchy, creating flood storage where appropriate and implement measures to ensure that surface water is not increased onsite or elsewhere.

3.4.3 Education

The existing Hunts Grove Primary Academy, which opened in 2019, is already approaching capacity. GCC Education has identified that this site will require a new primary school to support pupils arising from the development.

Developer contributions via s.106 agreement would be required to address additional demand for secondary education.

The Interim PPRs estimated the following demands and costs would arise from development at Hunts Grove Extension.

Table 10: Education demands and costs for Hunts Grove Extension

Primary		Secondary		Post-16		Site Totals	
Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)
288.75	£4,317,968	127.5	£2,462,280	45	£1,026,135	461	£7,806,383

3.4.4 Health and Social Care

A new GP surgery was identified for development in the 2014 IDP as part of the Hunts Grove Strategic Development Site. This site is yet to deliver a surgery, and if one is not delivered as part of the proposed 750 home Hunts Grove Extension site outlined in Policy CP2, it is likely that an extension would be required to Kingsway Surgery. Contributions could be sought from development at the site to support this.

The benchmarks informed by the CCG estimates that there would be demand for 176.25sqm of surgery space at a cost of £705,000.

3.4.5 Likely projects to support development

Dependent on the impacts of development, it may be appropriate to require planning obligations towards the following schemes.

Transport schemes have either been identified within the Local Transport Plan, or within the Transport Modelling Report and are deemed appropriate based on modelling outputs and spatial links to the proposed site allocation. This is based upon the midpoint cost from existing evidence and assumes a per unit figure for each of these schemes when considered in combination with the other two developments

Other projects have been derived through consultation with infrastructure providers, use of benchmarks or existing / updated guidance such as the Recreation Mitigation Strategies.

3.5 Sharpness Docks (PS34)

3.5.1 Transport and Highways

A total of eight pinch-points have been identified in the transport model within the Berkeley Cluster which would be affected by the proposed allocation at PS34 Sharpness Docks.

The transport model indicates that if unmitigated, the B4066 would exceed capacity at the AM peak as a result of Local Plan Review growth. The A38 southbound would approach capacity. Highway mitigation was tested in the form of the widening of the B4066 approach and signalisation of the junction.

It is expected that unmitigated Local Plan Review growth would result in an exceedance of the capacity of the Breadstone junction with the A38. Mitigation in this location may not be appropriate due to the constrained nature of the junction and the minor nature of the road, and instead, should be addressed via improvements to the aforementioned A38 / B4066 junction.

The transport model indicates that the A38 / B4066 Berkeley Road would exceed capacity both at the AM and PM peak as a result of the Local Plan Review growth. Highway mitigation is required at this location to include traffic signalisation from the B4066 onto the A38. Further consideration will be required to address potential link capacities on the A38.

The A38 junction at Stone is anticipated to exceed capacity during the AM peak. The transport model indicates that there would be large increases in southbound demand on this route associated with the Local Plan Review growth. Mitigation in this location is unlikely to be appropriate due to the minor nature of the road, which is inappropriate for large volumes of traffic.

The junction of Alkington Lane with the A38 is expected to reach 130% of capacity at the AM peak and 100% at the PM peak. The 'major' mitigation proposed to respond to capacity issues at the A38 / B4066 Berkeley Road would join the A38 in this location. This option would require land acquisition either side of Alkington Lane.

The transport model also identifies that the eastbound approach of the B4066 / Station Road roundabout, Berkeley would exceed capacity. Highway mitigation in the form of a widened eastbound approach would be required.

The A38 / A4135 roundabout at Slimbridge is expected to exceed capacity as a result of the Local Plan Review growth. In both the AM and PM peak, the northbound approach is expected to approach or exceed 100%. The transport model considers highway mitigation in the form of a widened northbound approach on the A38.

The final junction within the Berkeley Cluster which is expected to approach capacity is the A38 / Wick Road. Wick Road is assessed as exceeding capacity in the PM peak. Mitigation was considered inappropriate in this location given the nature of Wick Road and the potential for improvements elsewhere nearby.

The Aecom Mitigation Review identifies that it may be appropriate to collect planning obligations for 11 schemes identified within either the TFR, LTP or Sustainable Transport Strategy. These are listed within Appendix A.

The Aecom Funding and Delivery Plan identifies that it may be appropriate to secure contributions from development at Sharpness Docks towards the Junction 14 and A38 corridor packages of mitigation.

Contributions via s.106 agreement will be sought from this development as appropriate for these schemes, as well as for the feasibility and implementation of cycle routes and other active travel options in the area.

3.5.2 Flood Risk Management and Drainage

The site is in close proximity to the River Severn, which forms the western and northern boundaries of the site. The Gloucester and Sharpness Canal crosses the site in a south-easterly direction from the north-eastern corner.

A small proportion of the site (6%) is within Flood Zone 3a (1 in 100-year event). The site is at low risk of surface water flooding and low to moderate risk of groundwater flooding. There is a risk of flooding from the Gloucester and Sharpness Canal.

The LLFA has highlighted that the EA’s Detailed River Network map includes a mistake in this location. The map shows the ordinary watercourse that enters the east of the site at the village hall go south west towards the B4066 and travel south. Its route instead goes northwest under Oldminster Road, Sharpness Play Park and the railway, through the recycling area, then follows parallel to the docks and outfalls at the River Severn.

Development on site should be sequentially located within Flood Zone 1 where possible, and if not possible, an Exception Test must be satisfied.

A site-specific flood risk assessment is required at planning application stage, along with a surface water drainage strategy. Appropriate storage of surface water runoff will need to be provided, and assessments should identify opportunities to provide off-site betterment, to help offset the cumulative impact of development.

As the site is a brownfield site, the applicant should seek a betterment in discharge rate of at least 40% over the current rate.

The Environment Agency is actively considering changes to the Shoreline Management Plan that would affect this site and the developer is advised to engage with them on this issue.

3.5.3 Education

Developer contributions via s.106 agreement would be required to address additional demand for primary and secondary education arising from the proposed development.

The Interim PPRs estimated the following demands and costs would arise from development at Sharpness Docks.

Table 11: Education demands and costs for Sharpness Docks

Primary		Secondary		Post-16		Site Totals	
Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)
115.5	£1,727,187	51	£984,912	18	£410,454	185	£3,122,553

3.5.4 Health and Social Care

It is understood that the Marybrook Medical Centre in Berkeley is exploring options for an expansion to respond to existing growth, however this £900,000 scheme of improvements would not be sufficient to respond to the significant levels of growth proposed in Sharpness.

It is likely that Sharpness Docks Strategic Development Site will need to contribute to a larger expansion of Marybrook or towards a new surgery at the nearby Sharpness Garden Village site.

It is estimated that the development at Sharpness will give rise for demand for 70.50sqm of additional doctors’ surgery space at a cost of £246,750. It may be appropriate to utilise developer contributions (monies, buildings or land) secured via s.106 agreement towards an appropriate solution.

3.5.5 Open Space, Green Infrastructure and Biodiversity

The Sharpness Docks strategic development site must ensure no adverse effect will occur on the integrity of the Severn Estuary SAC/SPA/Ramsar site. Sharpness Docks will provide a mix of tourism, leisure and recreational uses, supported by new housing development, including tourism and recreational related facilities, including a community football pitch, community gardens, informal green space and equestrian development and landscaping incorporating existing hedgerows and trees.

3.6 Sharpness (PS36)

3.6.1 Transport and Highways

Consultation with GCC Highways highlighted the reliance on the PS36 New settlement at Sharpness providing a high level of trip internalisation. It is therefore vital that supporting infrastructure, such as shops and services, are provided in a timely fashion to minimise out-commuting and reduce pressure on the surrounding highway network.

Concerns are raised in the LTP that the B4066 and Alkington Lane which link the site allocation to the A38 Bristol Road is not sufficient to support the levels of growth set out in the Local Plan Review. Corridor improvements remain a short-term priority on the B4066 in the Local Transport Plan.

It is expected that unmitigated Local Plan Review growth would result in an exceedance of the capacity of the Breadstone junction with the A38. Mitigation in this location may not be appropriate due to the constrained nature of the junction and the minor nature of the road, and instead, should be addressed via improvements to the aforementioned A38 / B4066 junction.

The transport model indicates that the A38 / B4066 Berkeley Road would exceed capacity both at the AM and PM peak as a result of the Local Plan Review growth. Highway mitigation is required at this location to include traffic signalisation from the B4066 onto the A38. Further consideration will be required to address potential link capacities on the A38.

The A38 junction at Stone is anticipated to exceed capacity during the AM peak. The transport model indicates that there would be large increases in southbound demand on this route associated with the Local Plan Review growth. Mitigation in this location is unlikely to be appropriate due to the minor nature of the road, which is inappropriate for large volumes of traffic.

The junction of Alkington Lane with the A38 is expected to reach 130% of capacity at the AM peak and 100% at the PM peak. The 'major' mitigation proposed to respond to capacity issues at the A38 / B4066 Berkeley Road would join the A38 in this location. This option would require land acquisition either side of Alkington Lane.

The transport model identifies that the eastbound approach of the B4066 / Station Road roundabout, Berkeley would exceed capacity. Highway mitigation in the form of a widened eastbound approach would be required.

The A38 / A4135 roundabout at Slimbridge is expected to exceed capacity as a result of the Local Plan Review growth. In both the AM and PM peak, the northbound approach is expected to approach or exceed 100%. The transport model considers highway mitigation in the form of a widened northbound approach on the A38.

The final junction within the Berkeley Cluster which is expected to approach capacity is the A38 / Wick Road. Wick Road is assessed as exceeding capacity in the PM peak. Mitigation was considered inappropriate in this location given the nature of Wick Road and the potential for improvements elsewhere nearby.

Although in South Gloucestershire, the transport model has indicated that the new settlement at Sharpness Garden Village may result in capacity issues relating to Junction 14 of the M5 and the B4509 which links the motorway to the A38.

A joint working group has been established with South Gloucestershire Council, Stroud District Council and a number of developers with the aim of delivering a comprehensive scheme and avoiding a piecemeal approach to development and infrastructure delivery.

Highway mitigation in the form of a new junction at Junction 14 has been tested as part of the transport model. A scheme to widen the A38 and the approach from the B4509 are also included within the highway mitigation. It is expected that development within the vicinity of the junction would provide financial contributions towards addressing capacity issues in this location.

The Aecom Mitigation Review identifies that it may be appropriate to collect planning obligations for 11 schemes identified within either the TFR, LTP or Sustainable Transport Strategy. These are listed within Appendix A.

The Aecom Funding and Delivery Plan identifies that it may be appropriate to secure contributions towards the Junction 14 and A38 corridor packages of mitigation from development at the Sharpness site.

Concerns were raised in the Gloucestershire Rail Investment Strategy that whilst the reopening of the line could provide sustainable transport to Sharpness and enable significant growth in the area, analysis shows a very limited GVA impact for a very costly new piece of infrastructure. This was also reflected in the comments from Network Rail and GCC Highways. Network Rail has provided comments on further modelling work undertaken by Sharpness Development LLP and advice was provided for a strategic and economic case for the scheme to be produced. See section 2.1.3 for further details.

Active travel routes would need to be provided to developments in Sharpness. A potential scheme linking Cam Station to Sharpness/Slimbridge has been identified as a future potential cycle corridor in the Local Transport Plan. Feasibility is yet to be carried out on this potential route. Contributions may be sought from development to support the feasibility and implementation of a cycle route and other active travel options for this site.

3.6.2 Flood Risk Management and Drainage

The proposed site allocation is formed of two land parcels. The River Severn forms the western boundary of the southern parcel, with the Little Avon forming the boundary to the south of the site.

The site was subject to fluvial flooding in 2012 from the Little Avon.

Over a third of the site is considered to be at risk of a 1 in 100-year flood event from tidal/fluvial flooding from the River Severn and around a quarter of the site is considered to be at risk of a 1 in 100-year flood event from Little Avon. The site is at low risk of surface water flooding and low to moderate risk of groundwater flooding.

The southern part of the site benefits from flood defences in the form of a coastal embankment, which provides a protection from a 1 in 100-year flood. The northern part of the site is not covered by this embankment and there remains a risk across the site from the Little Avon.

Development on site should be sequentially located within Flood Zone 1 where possible, and if not possible, an Exception Test must be satisfied. Any application should include storage features outside of Flood Zone 3. The ordinary watercourses onsite will require an easement for maintenance and the development should be designed to consider the watercourses.

The Environment Agency is actively considering changes to the Shoreline Management Plan that would affect this site and the developer is advised to engage with them on this issue.

3.6.3 Education

GCC Education anticipates that either a new primary and a new secondary school are required, or an all-through school would be provided at the Sharpness new settlement. This would likely need to include six forms of entry at primary level and four forms of entry at secondary level.

The Interim PPRs estimated the following demands and costs would arise from development at Sharpness.

Table 12: Education demands and costs for Sharpness

Primary		Secondary		Post-16		Site Totals	
Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)
924	£13,817,496	408	£7,879,296	144	£3,283,632	1476	£24,980,424

3.6.4 Health and Social Care

The 2021 IDP sets out that the scale of development at Sharpness is likely to be sufficient to warrant the need for a new doctor's surgery, with over 560sqm of new surgery space required at a cost of £2.25m.

Whilst the Marybrook Medical Centre in Berkeley is exploring options for an expansion this £900,000 scheme of improvements would not be sufficient to respond to the growth proposed at Sharpness and a surgery will need to be provided onsite. It may be appropriate to utilise developer contributions (monies, buildings or land) secured via s.106 agreement towards this new surgery.

3.6.5 Open Space, Green Infrastructure and Biodiversity

The Sharpness strategic development site must ensure no adverse effect will occur on the integrity of the Severn Estuary SAC/SPA/Ramsar site.

Sharpness is allocated for a new garden community comprising employment, residential, retail, community and open space uses and strategic green infrastructure and landscaping. Development will be an exemplar for achieving carbon neutral development by 2030 and will take place in accordance with Garden City Principles. It will address the following onsite in an integrated and coordinated manner:

- A network of multifunctional Green Infrastructure throughout the development in accordance with Building with Nature standards and in excess of local provision standards to provide for public open space.
- The provision of SANGs with viewing platforms over the Severn Estuary.
- A diversion to the Severn Way, to absorb human recreational activity, particularly dog walking, away from the Estuary shoreline.
- Accessible natural green space, including tree planting to achieve carbon capture and areas for community food production.

If necessary, off-site work to mitigate and manage the identified impacts of development upon the Severn Estuary SAC/SPA/Ramsar site will include:

- A managed new nature reserve, including a new high tide roost area to complement the existing roost site at Berkeley Pill and other measures to deliver a net gain to local biodiversity.
- On-site community and built sports provision and contributions to off-site indoor sports and leisure facilities, in accordance with local standards.
- Structural landscaping buffers along boundaries incorporating existing and new native hedgerows and trees and linking with existing green infrastructure.
- A positive strategy for mitigating flood risk including attenuating and disposing of surface water through sustainable drainage systems (SuDS) that can form part of the GI network.

3.7 Stonehouse North West (PS19a)

3.7.1 Transport and Highways

The transport model indicates that movements at the M5 Junction 13 will increase substantially as a result of the growth set out in the Local Plan Review. The M5 southbound off-slip will increase to 90% of capacity in the AM peak. Highway mitigation has been tested in the form of a signalisation of each approach arm.

It is expected that development at Stonehouse North West will be required to contribute towards a scheme of mitigation for M5 Junction 13. Further consideration of how any capacity improvements at M5 Junction 13 may encourage traffic on link roads, such as the A38, A4135 and A419 will also be necessary at application stage.

The A419 / Oldends roundabout is expected to exceed capacity to the west of the junction as a result of the growth set out in the Local Plan Review. Highway mitigation has been tested in the form of a widening of the A419 between the Oldends and Chipmans Platt roundabouts. It is likely that contributions will be sought via s.106 agreement from the PS19a Northwest of Stonehouse allocation.

Both the eastbound and westbound approaches of the A419 / Boakes Drive roundabout are expected to exceed capacity as a result of the growth set out in the Local Plan Review. Highway mitigation is proposed in the form of widening of the A419 approaches. It is likely that contributions via s.106 agreement will be sought from the allocation PS19a Northwest of Stonehouse to fund this mitigation. Additional link capacity should also be considered at application stage.

A total of six schemes are identified in the Aecom Mitigation Review as being appropriate to gather planning obligations for from this site. Each of these schemes have either been identified within the Local Transport Plan, or within the Transport Modelling Report and are deemed appropriate based on modelling outputs and spatial links to the proposed site allocation.

3.7.2 Flood Risk Management and Drainage

This proposed site allocation is not assessed with Appendix O of the Level 2 SFRA as being at risk of flooding. It is expected that development on site will be sequentially located within Flood Zone 1.

It is expected that applications on this site provide a site-specific flood risk assessment. Developers must accord with the drainage hierarchy, creating flood storage where appropriate and implement measures to ensure that surface water is not increased onsite or elsewhere.

3.7.3 Education

GCC Education expects that a new primary school will need to be provided at the proposed Northwest of Stonehouse strategic development site (ref. PS19a) in the short to medium-term to support new housing development. GCC Education estimate this would need to be a contribution equivalent to a single form of entry on a 2ha site, with GCC funding the increase to 1.5 form of entry to address wider demands in Stonehouse.

There is limited scope to develop the Leonard Stanley and King's Stanley primary schools, so a new school in the Stonehouse Cluster will be vital in responding to growth.

The Interim PPRs estimated the following demands and costs would arise from development at Stonehouse North West.

Table 13: Education demands and costs for Stonehouse North West

Primary		Secondary		Post-16		Site Totals	
Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)
269.5	£4,030,103	119	£2,298,128	42	£957,726	431	£7,285,957

3.7.4 Health and Social Care

The Primary Care Infrastructure Plan¹² identifies a joint development for Stonehouse and north west of Stonehouse between Regent Street and Stonehouse health clinic or a new single development through Regent Street as a priority development. The new development would provide for an estimated list size of 10,000 patients and would have a capital cost of £2.47m.

Development of a primary care facility in this location is identified as a key priority of the PCIP for 2021 and the CCG anticipate that planning obligations may be required to part-fund the new Stonehouse surgery.

It may be appropriate to utilise developer contributions from the Stonehouse North West site (monies, buildings or land) secured via s.106 agreement towards this new surgery.

3.7.5 Open Space, Green Infrastructure and Biodiversity

The Stonehouse North West strategic development site will provide accessible natural green space to secure a net gain to local biodiversity and public outdoor playing space. It will also include onsite built facilities and contributions to off-site indoor sports and leisure facilities, in accordance with local standards.

If appropriate, off-site work to mitigate against the identified impacts of development upon the Severn Estuary SAC/SPA/Ramsar and Cotswold Beechwoods SAC sites should include structural landscaping buffer along the northern, western and eastern boundaries incorporating existing and new native hedgerows and trees and linking with existing green infrastructure.

¹² Gloucestershire Clinical Commissioning Group (2019) Primary Care Infrastructure Plan 2019 to 2026.

3.8 South of Hardwicke (G1)

3.8.1 Transport and Highways

The LTP and Transport Modelling Report identifies the following locations as being either at or approaching capacity as a result of development at South of Hardwicke (G1) and other site allocations within the Gloucester Fringe:

- A38 Cross Keys roundabout;
- M5 Junction 12;
- A38 / Epney Road;
- B4008 / Bristol Road; and
- A38 / A430 / B4008 Cole Avenue.

Each of the above schemes are also identified within the Aecom Mitigation Review. Subject to modelling of impacts at application stage, it may be appropriate to require planning obligations from any application at South of Hardwicke (G1) towards highway mitigation schemes and other travel measures within these locations.

The Aecom Funding and Delivery Plan identifies that it may be appropriate for development at the South of Hardwicke site to provide contributions towards the Junction 12 corridor package of mitigation.

This site should seek to provide active travel routes to the Gloucester and Sharpness Canal to the west and contributions may be sought for off-site connections to these routes.

3.8.2 Flood Risk Management and Drainage

The Shorn Brook, part of which is main watercourse that passes through the central and western land parcels of the site. The Gloucester and Sharpness Canal runs adjacent to the site. A flood relief channel is located adjacent to the Shorn Brook on Church Lane. This consists of a twin culvert under Church Lane and an open channel that connects the culvert to the watercourse.

Based on national flood zone mapping, approximately 8% of the site is located within fluvial flood zone. The site is at moderate risk of surface water flooding, with dispersed areas of ponding predicted to occur in low points across the site. There are records of properties on Sticky Lane flooding from the Shorn Brook, however no date is provided.

It is recommended that development proposals are sequentially located within Flood Zone 1. A site-specific flood risk assessment will be required at planning application stage. It is recommended that a detailed hydraulic model of the Shorn Brook is carried out for the site to accurately understand risk to the site. No flood storage features should be located in Flood Zone 3. Concerns have been raised through consultation with the Environment Agency with regard to surface water flooding and this must be properly assessed as part of any application.

3.8.3 Education

A new site for a secondary school / free school will be sought on either the Whaddon or Hardwicke sites, with up to a six form of entry school on an 8.5ha site required.

The Interim PPRs estimated the following demands and costs would arise from development at South of Hardwicke.

Table 14: Education demands and costs for South of Hardwicke

Primary		Secondary		Post-16		Site Totals	
Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)
519.75	£7,772,342	229.5	£4,432,104	81	£1,847,043	830	£14,051,489

3.8.4 Health and Social Care

A solution is yet to be identified by the CCG in relation to the South of Hardwicke allocation. The allocation is potentially large enough in itself (over 2,000 population) to warrant the creation of a branch surgery, or alternatively, contributions would be sought to improve an existing health centre. Kingsway Health Centre would geographically be the closest, however this is still some distance away.

3.8.5 Open Space, Biodiversity and Green Infrastructure

South of Hardwicke strategic development will provide on-site accessible natural green space providing a net gain to local biodiversity and public outdoor playing space, and if appropriate, off site space to mitigate against the identified impacts of development upon the Severn Estuary SAC/SPA/Ramsar and Cotswold Beechwoods SAC sites. This includes:

- On-site community building
- Contributions to off-site indoor sports and leisure facilities, in accordance with local standards
- A structural landscaping buffer along the western, southern and eastern boundaries incorporating existing and new native hedgerows and trees and linking with existing green infrastructure.

3.9 Wisloe (PS37)

3.9.1 Transport and Highways

The Aecom Mitigation Review identifies that it may be appropriate to collect planning obligations for 12 schemes identified within either the TFR, LTP or Sustainable Transport Strategy. These are listed within Appendix A.

The Aecom Funding and Delivery Plan identifies that it may be appropriate to secure contributions towards the Junction 14 and A38 corridor packages of mitigation from development at the Wisloe site allocation.

It is expected that the northbound approach on the A38 at the A38 / A4135 junction will exceed capacity. Contributions towards this mitigation will be sought as part of the allocation for PS37 New settlement at Wisloe.

Wisloe has good accessibility via road with the A4135 which intersects the site and close proximity to the A38 and M5. The STS sets out that the proposed new settlement at Wisloe should seek to deliver a sustainable transport corridor along A38 and A4135.

The Developer for Wisloe is proposing a pedestrian and cycle bridge across the M5. This represents a significant infrastructure offer that would transform accessibility from Sustrans route 41 and Slimbridge to Cam and connecting with the Cam-Dursley-Uley Greenway.

3.9.2 Flood Risk Management and Drainage

The site is in close proximity to the River Cam and there have been a number of recent sewer flooding events since 2007 affecting highways and the curtilage of properties.

The site is included within the Environment Agency 2007 River Cam and Wickster's Brook detailed hydraulic model, but only a minor proportion of the site (1%) is considered to be impacted by fluvial flood risk. The site is at high risk of groundwater flooding, with a greater than 75% chance of groundwater emergence within a given 1km² grid square, during a 1 in 100-year event.

It is recommended that development on the site is sequentially located away from areas of higher flood risk and located within Flood Zone 1.

The ordinary watercourse on the northern site will need to be surveyed and mapped as part of any application. Any proposals for drainage will have to be split into the separate catchments. The western side of the site north of the A4135 may be difficult to drain to the ordinary watercourse given the levels.

A site-specific flood risk assessment will be required at application stage.

3.9.3 Education

GCC Education has raised concerns that development at Wisloe and more widely in the adjacent Berkeley Cluster could result in significant demand for places at Cam. On-site provision and contributions towards expanding school provision in the Berkeley Cluster are therefore required to reduce pressure on Cam's schools.

The School Places Strategy sets out that Slimbridge Primary School would likely be affected by growth at Wisloe and a number of developments at Cam may affect numbers at Slimbridge as it is technically the nearest school, however poor walking routes may deter parents and impact the Cam schools instead.

The above demonstrates the importance of providing an additional primary school at Wisloe, where it is expected that a three form of entry primary school would be provided onsite.

The Interim PPRs estimated the following demands and costs would arise from development at Wisloe.

Table 15: Education demands and costs for Wisloe

Primary		Secondary		Post-16		Site Totals	
Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)
577.5	£8,635,935	255	£4,924,560	90	£2,052,270	923	£15,612,765

3.9.4 Health and Social Care

As there are limited options for expansion at the Cam & Uley Family Practice, it is likely that a branch surgery would need to be provided at the Wisloe Garden Village or the development would need to contribute to relocating the existing surgery.

The 2021 IDP sets out that the scale of development at Wisloe is likely to be sufficient to warrant the need for a new doctor's surgery, with over 350sqm of new surgery space required at a cost of £1.4m.

3.9.5 Open Space, Biodiversity and Green Infrastructure

The Wisloe Garden Village is allocated for a new garden community comprising employment, residential, retail, community and open space uses and strategic green infrastructure and landscaping. Development will be an exemplar for achieving carbon neutral development by 2030 and will take place in accordance with Garden City Principles. Strategic development will provide a network of multifunctional Green Infrastructure throughout the development which reflects Building with Nature standards and local provision standards to provide for public open space and accessible natural green space, including tree planting to achieve carbon capture and other measures to deliver a net gain to local biodiversity on site.

If appropriate, off-site work may be carried out to mitigate against the identified impacts of development upon the Severn Estuary SAC/SPA/Ramsar site. Structural landscaping buffers should be provided to prevent physical and visual coalescence with neighbouring villages and along boundaries with the M5 and A38, with appropriate noise attenuation measures, incorporating existing and new native hedgerows and trees and linking with existing green infrastructure. A positive strategy should be secured for attenuating and disposing of surface water through sustainable drainage systems (SuDS) that form part of the GI network.

3.10 Whaddon (G2)

3.10.1 Transport and Highways

The LTP and Transport Modelling Report identifies the following locations as being either at or approaching capacity as a result of development at Whaddon (G2) and other site allocations within the Gloucester Fringe:

- A38 Cross Keys roundabout;
- M5 Junction 12;
- A38 / Epney Road;
- B4008 / Bristol Road; and
- A38 / A430 / B4008 Cole Avenue

Subject to modelling of impacts at application stage, it may be appropriate to require planning obligations from applications for Strategic Site Allocations in the Gloucester Fringe, including Whaddon, towards highway mitigation schemes and other travel measures.

The A38 St Barnabas Roundabout in Gloucester is likely to be affected by the growth proposed at the eastern edge of the city at the allocation G2 Land at Whaddon. The transport model indicates that both the A38 approaches will exceed 100% if no mitigation is proposed, whilst the A4173 will exceed capacity in the northbound, and is forecast to become a rat-run. GCC Highways has identified a potential improvement scheme at the junction, which provides an enlarged roundabout with widening on the A38, A4173 and B4072 approaches. It is expected that contributions would be sought from the Whaddon site to deliver an appropriate scheme of mitigation.

The Aecom Mitigation Review identifies that it may be appropriate to collect planning obligations for FIVE schemes identified within either the TFR, LTP or Sustainable Transport Strategy. These are listed within Appendix A.

The Aecom Funding and Delivery Plan identifies that it may be appropriate to secure contributions from development at Whaddon towards the Junction 12 package of mitigation.

3.10.2 Flood Risk Management and Drainage

The Main River Daniel's Brook flows in a north-westerly direction through the site before becoming culverted below the railway embankment along the western boundary. In the south of the site, another ordinary watercourse forms a tributary to the brook.

The site is at relatively high risk of fluvial and surface water flooding on the basis of the Environment Agency 2007 Daniel's Brook 1D-only hydraulic model. There are no historic flood events recorded onsite. There are reports of flooding to the north of the site on Harkwell Close from 2012. The current hydraulic modelling would need to be extended and upgraded.

A flood scheme has been completed on Grange Road at the junction to Bybrook Road to alleviate the above flooding issue. It is therefore vital that any development does not result in an increase in surface water coming off the north of the site. A robust surface water management strategy is important as part of any applications and should include an exceedance plan.

It is recommended that development proposals are sequentially located within Flood Zone 1. A site-specific flood risk assessment will be required at planning application stage.

A surface water flow path from the east of the site at Court Farm, which is not recorded on the EA's Detailed River Network (DRN) maps, should be surveyed and investigated. If culverted, the development should seek to open the culvert up. If there is no evidence of a watercourse or culvert, then the surface water flow path will have to be managed appropriately through the layout of the development. The same applies for the possible watercourse from Brook Farm, identified in the EA's DRN, however, this isn't shown on the latest OS map. If there is a culverted watercourse, this should be opened up.

The Environment Agency has set out via consultation that this development should seek to deliver significant environmental enhancements in addition to flood risk benefits to downstream areas of Gloucester associated with the Daniels and Whaddon Brooks, including improvements to the standard of protection offered by existing schemes.

3.10.3 Education

It is expected that pupils arising from the Land at Whaddon site would be catered for by a new primary school onsite.

In terms of secondary provision, a new site for a secondary school / free school will be sought on either the Whaddon or Hardwicke sites, with up to a six form of entry school on an 8.5ha site required.

The Interim PPRs estimated the following demands and costs would arise from development at Whaddon.

Table 16: Education demands and costs for Whaddon

Primary		Secondary		Post-16		Site Totals	
Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)	Demand (Places)	Cost (£)
1155	£17,271,870	510	£9,849,120	180	£4,104,540	1845	£31,225,530

3.10.4 Health and Social Care

The proposed Land at Whaddon allocation would likely require a new surgery to be provided onsite given its size and when considered alongside the other levels of growth set out in the Gloucester Fringe could place significant pressure on the surgeries to the south and east of Gloucester.

The 2021 IDP sets out that the new doctor's surgery would need to provide over 700sqm of new surgery space required at a cost of £2.8m to respond to the demand generated by the development.

3.10.5 Biodiversity, Open Space and Green Infrastructure

Strategic development at Whaddon will be required to address the following:

Accessible natural green space along the Daniels Brook providing a net gain to local biodiversity and public outdoor playing space,

on-site community building and contributions to off-site indoor sports and leisure facilities, in accordance with local standards;

if appropriate, off site work to mitigate against the identified impacts of development upon the Severn Estuary SAC/SPA/Ramsar and Cotswold Beechwoods SAC sites; Structural landscaping buffer along the western, southern and eastern boundaries incorporating existing and new native hedgerows and trees and linking with existing green infrastructure; A layout, density and built form and character which reflects the sensitive landscape and heritage context provided by the Cotswolds AONB and local heritage assets including Whaddon Church respectively;.

Appendix A – Site-by-site Projects

Likely projects to support development

This section sets out a list of projects for each of the Strategic Allocations, that, dependent on the impacts of development, it may be appropriate to require planning obligations towards.

Transport schemes have either been identified within the Local Transport Plan, or within the Transport Modelling Report and are deemed appropriate based on modelling outputs and spatial links to the proposed site allocation. A nominal cost has been calculated by Aecom on behalf of Stroud District Council for each of these projects. A Funding and Delivery Plan has been undertaken for the M5 Junction 12, Junction 14 and A38 corridor schemes to package together mitigation, identify potential funding options and apportion costs. Other costs for schemes not included in the Funding Delivery Plan are derived from the LTP, STS and TFR using the methodology set out in the 2021 IDP and Section 2.1.1 of this report.

Other projects have been derived through consultation with infrastructure providers, use of benchmarks or existing / updated guidance such as the Recreation Mitigation Strategies. Costs for Education have been derived from the Interim Pupil Product Ratios.

The tables below also include site-specific projects identified within the 2021 Stroud IDP Project Tracker, which were identified through consultation with stakeholders and other guidance.

Cam North West (PS24)

Dependent on the impacts of development at Cam North West, it may be appropriate to require planning obligations towards the following schemes. Due to the location of the proposed site allocation, it is likely that a number of the schemes will be also contributed to by other developments in the Cam and Dursley Cluster. No apportionment analysis has taken place for transport and highway schemes. The costs provided are total estimated costs as per the Aecom Mitigation Review.

Table 17: Cam North West Projects

Scheme Name	Costs
Transport and Highways	
Park & Interchange Hub at Cam & Dursley Railway Station	£436,047
Cycle access improvements for Cam and Dursley Active Travel Route to Uley	£436,047
Cam & Dursley Railway Station enhancements	£436,047
Highway improvements Dursley Relief Road	£436,047
Junction improvement - A4135/B4066 Dursley Rd roundabout, Dursley	£1,041,667
Junction improvement - A4135/B4060, Woodfield roundabout, Dursley	£1,041,667
Cam & Dursley Greenway and Wisloe Extension	£436,047
Contribution towards A38 mitigation package	£163,729
Education	
One new primary school	£5.2m
Contribution towards secondary school education	£3.0m
Contribution towards Post-16 education	£1.2m
Health and Social Care	
New doctor's surgery	£846,000
Open Space, Green Infrastructure and Biodiversity	
Severn Estuary Mitigation Payment	£346,500
Community Facilities	
New community facilities and libraries contribution	£784,392
Emergency Services	
Dursley Community Responder Scheme (ambulance)	TBC

Cam North East Extension (PS25)

Dependent on the impacts of development at the Cam North East Extension, it may be appropriate to require planning obligations towards the following schemes. Due to the location of the proposed site allocation, it is likely that a number of the schemes will be also contributed to by other developments in the Cam and Dursley Cluster. No apportionment analysis has taken place for transport and highway schemes. The costs provided are total estimated costs as per the Aecom Mitigation Review.

Table 18: Cam North East Extension Projects

Scheme Name	Cost
Transport and Highways	
Park & Interchange Hub at Cam & Dursley Railway Station	£87,209
Cycle access improvements for Cam and Dursley Active Travel Route to Uley	£87,209
Cam & Dursley Railway Station enhancements	£87,209
Highway improvements Dursley Relief Road	£87,209
Junction improvement - A4135/B4066 Dursley Rd roundabout, Dursley	£208,333
Junction improvement - A4135/B4060, Woodfield roundabout, Dursley	£208,333
Cam & Dursley Greenway and Wisloe Extension	£87,209
Education	
Contribution towards primary school education	£1.0m
Contribution towards secondary school education	£591,000
Contribution towards Post-16 education	£246,000
Health and Social Care	
Contribution towards doctor's surgery improvements	£148,000
Open Space, Green Infrastructure and Biodiversity	
Severn Estuary Mitigation Payment	£69,300
Community Facilities	
New community facilities and libraries contribution	£156,878

Hunts Grove Extension (PS30)

Dependent on the impacts of development at the Hunts Grove Extension, it may be appropriate to require planning obligations towards the following schemes. Due to the location of the proposed site allocation, it is likely that a number of the schemes will be also contributed to by other developments in the Gloucester Fringe; including G1 South of Hardwicke and G2 Land at Whaddon. No apportionment analysis has taken place for transport and highway schemes. The costs provided are total estimated costs as per the Aecom Mitigation Review.

Table 19: Hunts Grove Extension Projects

Scheme Name	Costs
Transport and Highways	
Active Travel Route - B4008 between little Haresfield (M5 J12) and Stonehouse Corridor	£330,882
A38 / Epney Road junction improvements	£91,912
St. Barnabas Roundabout improvement	£459,559
A38 / A430 / B4008 Cole Avenue junction improvement	£459,559
Contribution towards Junction 12 mitigation package	£757,282
Education	
One new primary school	£4.3m
Contribution towards secondary school education	£2.5m
Contribution towards Post-16 education	£1.0m
Health and Social Care	
Contribution towards doctor's surgery improvements	£705,000
Open Space, Green Infrastructure and Biodiversity	
Cotswold Beechwoods Mitigation Payment	£140,250
Severn Estuary Mitigation Payment	£288,750
Community Facilities	
New community facilities	£653,660

Sharpness Docks (PS34)

Dependent on the impacts of development at the Sharpness Docks allocation, it may be appropriate to require planning obligations towards the following schemes. It is likely that a number of the schemes will be also contributed to by the Sharpness Garden Village Strategic Site Allocation (PS36). No apportionment analysis has taken place for transport and highway schemes. The costs provided are total estimated costs as per the Aecom Mitigation Review.

Table 20: Sharpness Docks Projects

Scheme Name	Costs
Transport and Highways	
Gloucester to Sharpness walking & cycle Improvements	£130,662
Sharpness Branch Line and New Station	£138,889
B4066 / Station Road junction improvements	£6,533
B4066 / Alkington Lane junction improvements	£69,444
Contribution towards M5 Junction 14 mitigation package	£872,219
Contribution towards A38 Corridor mitigation package	£474,147
Education	
Contribution towards primary school education	£1.7m
Contribution towards secondary school education	£985,000
Contribution towards Post-16 education	£411,000
Health and Social Care	
Contribution towards doctor's surgery improvements	£246,750
Open Space, Green Infrastructure and Biodiversity	
Severn Estuary Mitigation Payment	£115,500
Community Facilities	
New community facilities and libraries contribution	£261,464
Emergency Services	
Berkeley Cluster standby point	TBC
Utilities	
Berkeley Cluster sewerage treatment works improvements	TBC

Sharpness (PS36)

Dependent on the impacts of development at the Sharpness allocation, it may be appropriate to require planning obligations towards the following schemes. It is likely that a number of the schemes will be also contributed to by the Sharpness Docks Strategic Site Allocation (PS34). No apportionment analysis has taken place for transport and highway schemes. The costs provided are total estimated costs as per the Aecom Mitigation Review.

Table 21: Sharpness Projects

Scheme Name	Costs
Transport and Highways	
Gloucester to Sharpness walking & cycle Improvements	£1,045,296
Sharpness Branch Line and New Station	£1,111,111
B4066 / Station Road junction improvements	£52,265
B4066 / Alkington Lane junction improvements	£555,556
Contribution towards M5 Junction 14 mitigation package	£1,851,506
Contribution towards A38 Corridor mitigation package	£1,078,048
Education	
One new primary school (or all-through school)	£13.8m
One new secondary school (or all-through school)	£7.9m
Post-16 education (or all-through school)	£3.3m
Health and Social Care	
New doctor's surgery	£2.25m
Open Space, Green Infrastructure and Biodiversity	
Severn Estuary Mitigation Payment	£924,000
Community Facilities	
New community facilities	£2,091,711
Emergency Services	
Berkeley Cluster standby point	TBC
Utilities	
Berkeley Cluster sewerage treatment works improvements	TBC

Stonehouse North West (PS19a)

The following schemes may require planning obligations towards from the Stonehouse North West allocation, dependent on the impacts of development. No apportionment analysis has taken place for transport and highway schemes. The costs provided are total estimated costs as per the Aecom Mitigation Review.

Table 22: Stonehouse North West Projects

Scheme Name	Costs
Transport and Highways	
Strategic Park & Interchange hub scheme for M5 J13/A419	£3,125,000
Active Travel Route - Stroudwater Navigation to Gloucester & Sharpness Canal	£4,000,000
Improvements to National Cycle Network, Route 45, Stroud	£625,000
Stonehouse Railway Station improvements	£625,000
A419 / Oldends roundabout improvements	£1,562,500
A419 / Boakes Drive roundabout improvements	£31,250
Education	
One new primary school	£4.0m
Contribution towards secondary school education	£2.3m
Contribution towards Post-16 education	£960,000
Health and Social Care	
Contribution towards new doctor's surgery	£2.47m
Open Space, Green Infrastructure and Biodiversity	
Cotswold Beechwoods Mitigation Payment	£130,900
Severn Estuary Mitigation Payment	£269,500
Community Facilities	
New community facilities and libraries contribution	£422,552
Emergency Services	
New ambulance service standby point	TBC

South of Hardwicke (G1)

Dependent on the development impacts of the South of Hardwicke allocation, it may be appropriate to require planning obligations towards the following schemes. It is expected that a number of the schemes identified would be contributed towards by other development in the Gloucester Fringe, as well as sites coming forward in the JCS area. No apportionment analysis has taken place for transport and highway schemes. The costs provided are total estimated costs as per the Aecom Mitigation Review.

Table 23: South of Hardwicke Projects

Scheme Name	Costs
Transport and Highways	
Active Travel Route - B4008 between little Haresfield (M5 J12) and Stonehouse Corridor	£330,882
A38 / Epney Road junction improvements	£165,441
St. Barnabas Roundabout improvements	£827,206
A38 / A430 / B4008 Cole Avenue junction improvements	£827,206
Contribution towards M5 Junction 12 mitigation package	£927,067
Education	
One new primary school	£7.7m
Contribution to new secondary school on Whaddon or new on-site secondary school	£4.4m
Contribution towards Post-16 education	£1.9m
Health and Social Care	
Contribution towards doctor's surgery improvements	£2.0m
Open Space, Green Infrastructure and Biodiversity	
Cotswold Beechwoods Mitigation Payment	£252,450
Severn Estuary Mitigation Payment	£519,750
Community Facilities	
New community facilities and libraries contribution	£814,922
Utilities	
Gloucester Fringe Electricity Substation	TBC

Wisloe (PS37)

The following schemes may require planning obligations towards from the Wisloe Strategic Site Allocation, dependent on the impacts of development. It is expected that many of these schemes will be contributed to by major development within the Berkeley Cluster. No apportionment analysis has taken place for transport and highway schemes. The costs provided are total estimated costs as per the Aecom Mitigation Review.

Table 24: Wisloe Projects

Scheme Name	Costs
Transport and Highways	
Park & Interchange Hub at Cam & Dursley Railway Station	£726,744
Cycle access improvements for Cam and Dursley Active Travel Route to Uley	£726,744
Cam & Dursley Railway Station enhancements	£726,744
Highway improvements Dursley Relief Road	£726,744
Cam & Dursley Greenway and Wisloe Extension	£726,744
Contribution towards A38 mitigation package	£1,015,172
Education	
One new primary school	£8.6m
Contribution to secondary school education	£4.9m
Contribution towards Post-16 education	£2.1m
Health and Social Care	
Contribution towards doctor's surgery relocation	£1.4m
Open Space, Green Infrastructure and Biodiversity	
Severn Estuary Mitigation Payment	£577,500
Community Facilities	
New community facilities and contribution towards libraries	£1,307,319

Whaddon (G2)

It may be appropriate to require planning obligations towards the following schemes from the Whaddon Strategic Site Allocation, along with other developments within the Gloucester Fringe and those sites brought forward within the JCS area. No apportionment analysis has taken place for transport and highway schemes. The costs provided are total estimated costs as per the Aecom Mitigation Review.

Table 25: Whaddon Projects

Scheme Name	Costs
Transport and Highways	
Active Travel Route - B4008 between little Haresfield (M5 J12) and Stonehouse Corridor	£735,294
A38 / Epney Road junction improvements	£367,647
St. Barnabas Roundabout improvements	£1,838,235
A38 / A430 / B4008 Cole Avenue junction improvements	£1,838,235
Contribution towards M5 Junction 12 mitigation package	£529,978
Education	
One new primary school	£17.3m
Contribution to new secondary school on South of Hardwicke or new on-site secondary school	£9.9m
Contribution towards Post-16 education	£4.1m
Health and Social Care	
One new doctor's surgery	£2.8m
Open Space, Green Infrastructure and Biodiversity	
Cotswold Beechwoods Mitigation Payment	£561,000
Community Facilities	
New community facilities and contribution towards libraries	£2,614,639
Utilities	
Gloucester Fringe Electricity Substation	TBC