



NEIGHBOURHOOD PLAN

Housing Calculation for Apperley

April 2020

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SUMMARY

In the Joint Core Strategy (JCS) for the City of Gloucester and the Boroughs of Cheltenham and Tewkesbury, the purpose of setting out an overall amount of rural housing was to provide strategic direction for preparation of the Tewkesbury Borough Plan and neighbourhood plans, where local level (non-strategic) housing sites will be identified.

The JCS identifies through its Policy SP1 that Tewkesbury Borough Council will need to accommodate at least 9,899 new homes over the Plan period between 2011 and 2031. Of this total, through its approach to rural sites, 1860 were allocated to two Service Centres (Bishop's Cleeve and Winchcombe) and 880 were allocated to twelve Service Villages (listed later in this document).

Numbers of new houses were allocated to each the twelve Service Villages by a calculation based largely on the number of existing houses with a boundary defined for each village. A smaller allocation to each Service Village was based on scores from an audit of all settlements in the Borough and on scores based on the distances and travelling times from each Service Village to both Gloucester and Cheltenham. These scores compared the Service Villages for their local services and accessibility to the two major employment areas within the JCS area.

This report explains the process of disaggregation, whereby the 880 new houses were assigned to the twelve Service Villages.

Apperley, being the largest settlement within the Parish of Deerhurst, was considered as a service village but its score in the settlement audit (based on its services) was too low and its accessibility (based on travel distances and travel times) was too poor.

By applying the same disaggregation process to Apperley, it is possible to calculate the number of new houses that would have been allocated to the settlement; had it been selected as a Service Village.

In the Tewkesbury Borough Plan 2011-2031, Apperley has been allocated a smaller number of new houses, based on a 5 per cent increase in the number of houses within the settlement. It is one of three settlements given this allocation because each had previously been defined by a residential development boundary; in the previous Borough Plan to 2011.

Nine years into the period for which both the Joint Core Strategy and the Tewkesbury Borough Plan apply, more new houses have already been built in Apperley than this 5 per cent increase requires.

In this report, several calculations are explained that put into context any number of new houses proposed in the Neighbourhood Plan for the Parish of Deerhurst.

Growth in Housing Numbers, 1900-2018

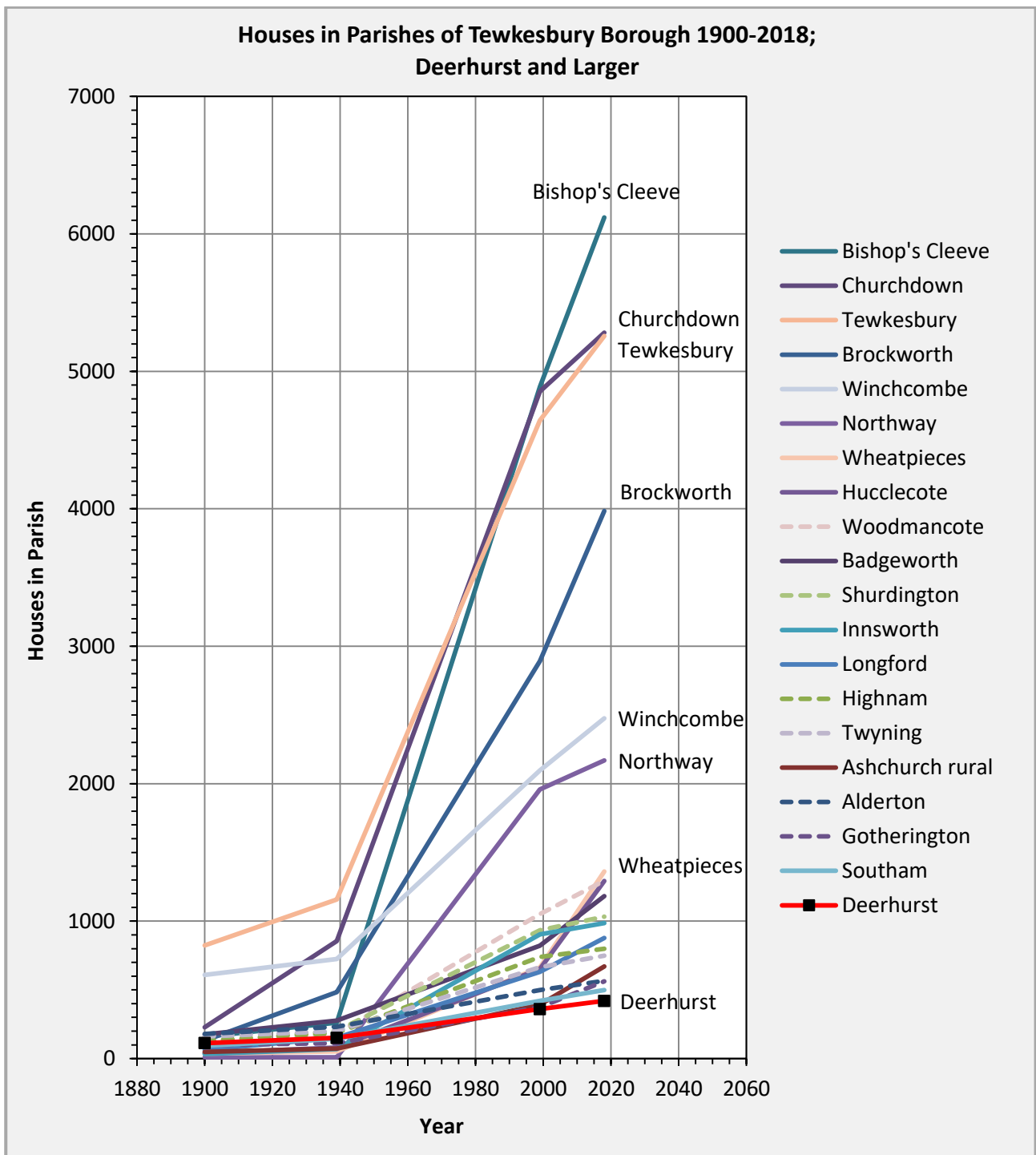
The following two graphs (Figures 1 and 2) are based on Local Insight profiles for 55 parishes in Tewkesbury Borough, published by Oxford Consultants for Social Inclusion (OCSI) in January 2019. In Figure 1, "Tewkesbury" refers to the town.

The information has been split into two graphs because of the wide range between the largest parish (Bishop's Cleeve) and the smallest parish (Chaceley), based on numbers of houses. In Figure 2, Deerhurst is shown as the smallest parish (with 19 larger parishes) and, in Figure 3, it is shown as the largest parish (with 35 smaller parishes).

In 1900, Deerhurst was the parish with the thirteenth largest number of houses. By 2018, it had become the parish with the twentieth largest number of houses; overtaken by nine (Southam, Gotherington, Ashchurch rural, Longford, Innsworth, Hucclecote, Woodmancote, Wheatpieces and Northway); and overtaking two (Ashleworth and Dumbleton).

Since the Second World War, the number of houses in the parish of Deerhurst has increased from 151 to 420, largely due to the increase within the settlement of Apperley.

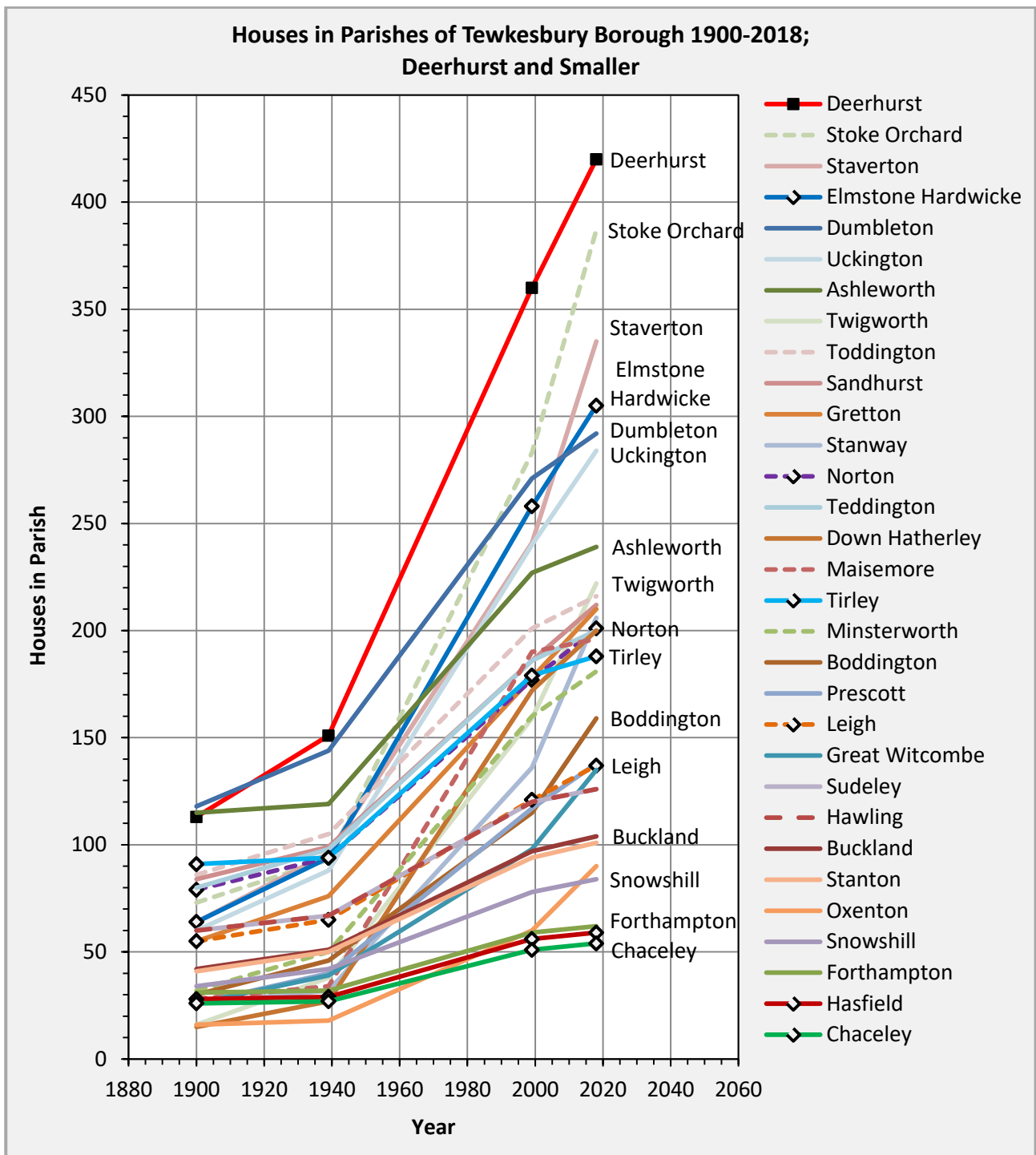
FIGURE 1



Deerhurst is also shown in Figure 2 but on a different vertical scale and with all the parishes that in 2018 have fewer houses. In the OCSI local profiles, it is assumed that no new houses were built between during the Second World War 1939 and 1945. For clarity, these numbers of houses are only shown in Figures 1 and 2 for 1939.

From Figure 1, it is very clear that most (58.8%) of the houses in Tewkesbury Borough are in only six parishes: Bishop's Cleeve, Churchdown, Tewkesbury (town), Brockworth, Winchcombe and Northway. During the Second World War, the same six parishes accounted for 46.2% of the houses in the Borough.

FIGURE 2



By use of markers in Figure 2, rural parishes with boundaries in common with Deerhurst (Elmstone Hardwicke, Norton, Tirley, The Leigh, Hasfield and Chaceley) are highlighted. This shows clearly how the number of houses in 2018 is a large multiple (3.72) of the number of houses in 1900 in Deerhurst than in these neighbouring parishes (an average of 2.75). Individually, Elmstone Hardwicke has a higher multiple (4.77) but this is partly due to some of Deerhurst being transferred to Elmstone Hardwicke by modifying the boundary between them.

Number of New Houses for Parish Based on Equal Allocation across Borough

If the nomination of two Service Villages and twelve Service Villages in the Joint Core Strategy is ignored and the requirement for 9,899 new houses in Tewkesbury Borough is divided equally across the Borough based on the numbers of houses in each parish in 2011, the number of new houses for each parish over the period 2011-2031 can be calculated by a relatively simple equation; which is shown below. The number of houses in 2011 is estimated by linear interpolation over the period 2000-2018.

Based on the OSCI Local Profile for Deerhurst Parish, the numbers of houses build during the reporting periods are shown in the following table:

Period	Houses Built	Total
<1900	113	113
1900-1939	38	151
1945-1999	209	360
2000-2018	60	420
PARISH ESTIMATE, Total at 2011		398

Based on all the OSCI Local Profiles for parishes within Tewkesbury Borough, the numbers of houses build during the reporting periods are shown in the following table:

Period	Houses Built	Total
<1900	4909	4909
1900-1939	2649	7558
1945-1999	27507	35065
2000-2018	7963	43028
BOROUGH ESTIMATE, Total at 2011		40094

Based on these estimates of the numbers of houses in Deerhurst Parish and Tewkesbury Borough at 2011, the number of houses allocated to Deerhurst would be:

$$398 / 40,094 \times 9,899 = \mathbf{98} \text{ houses}$$

This is close to the result (100 houses) given by AECOM in their report about housing allocations. While this may be interesting, it has no relevance because of the approach to rural parishes set out in the Joint Core Strategy (JCS) and implemented in the Tewkesbury Borough Plan 2011-2031.

Houses within the Settlement of Apperley

In the Tewkesbury Borough Plan to 2011, for planning purposes the settlement of Apperley was defined by a boundary that is shown in Figure 3 (on the following page).

At the end of the Second World War, there were 26 houses within this boundary. This was 23% of the 113 houses in Deerhurst Parish. In 2011, there were 196 houses (almost half of the total in the Parish). This number is the basis for calculating housing allocations in the period 2011-2031.

In the Tewkesbury Borough Plan 2011-2031, this settlement boundary has been discarded. However, it serves as a basis for any replacement boundary that might be used to define “infill” in future planning policies.

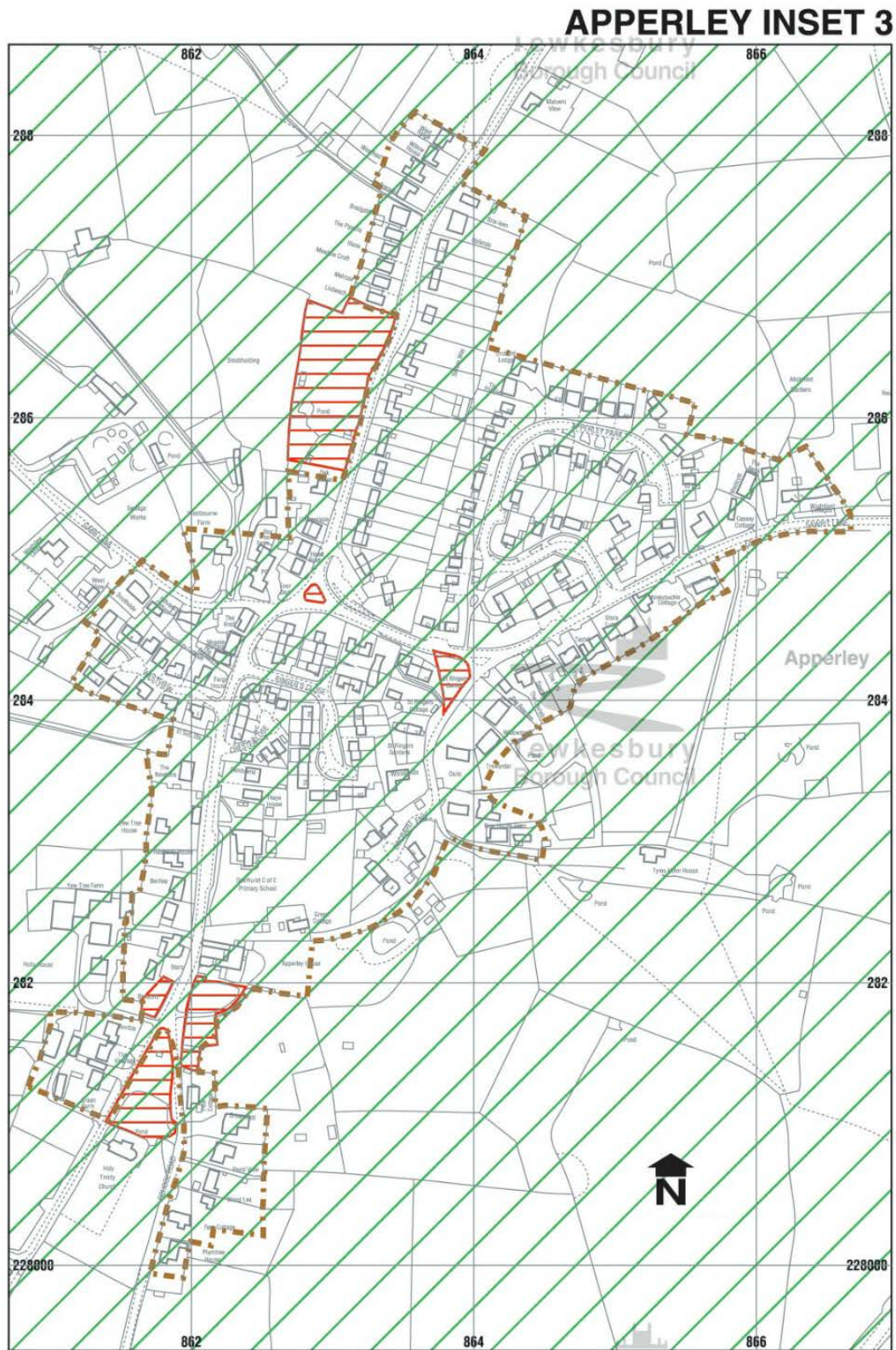
Since 2011, a total of 21 houses have been built within or adjacent to the boundary defining Apperley. A further two houses were already adjacent to the boundary and another adjacent to one of those two houses. Thus, up to 222 houses might be considered to be part of the settlement of Apperley in 2020.

The rapid expansion in house numbers began with the building of Severn Way. Since the end of the Second World War, the following houses have been built or modified to create additional dwellings:

Period	Road	Houses
1945-2011	Apperley Park	46
	Ringers Close	29
	Severn Way	22
	Deerhurst Road	15
	Sawpit Lane	12
	Westview	11
	Chester Close	10
	School Road	7
	The Green	5
	St Ringers Gardens	5
	Orchard End	5
	Gabb Lane	3
	TOTAL	170

Period	Road	Houses
2011-2020	Oaklands	13
	Deerhurst Road	4
	Severn Walk	3
	Court Drive	1
	TOTAL	21

FIGURE 3



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Settlement Boundary to 2011:  Important Open Spaces: 

Service Village Disaggregation

As part of the approach to rural sites in the Joint Core Strategy (JCS), a total of 880 new houses were allocation by means of a calculation. Most of these houses (704, which is 80% of the total) was allocated proportionally based on the number of houses (**H**) existing in each Service Village in 2011. The inputs and results of this part of the calculation are listed in the following table:

Service Village	Existing Houses H	Allocation $0.1535 \times H$
Alderton	277	42.5
Coombe Hill	39	6.0
Gotherington	463	71.1
Highnam	720	110.5
Maisemore	165	25.3
Minsterworth	174	26.7
Norton	61	9.4
Shurdington	765	117.4
Stoke Orchard	93	14.3
Toddington (incl New Town)	174	26.7
Twyning	446	68.5
Woodmancote	1210	185.7
SUB-TOTAL	(houses) 4587	(80%) 704

The next largest allocation (88, which is 10% of the total) is based on the score (**F**) given to each Service Village in the settlement audit of every settlement in the Borough of Tewkesbury, updated in 2011. With the passage of time, these scores change. For example, in 2018, most settlements would have a higher score due to the improved broadband service. The inputs and results of this part of the calculation are listed in the following table:

Service Village	Function Score F	Allocation $0.3894 \times F$
Alderton	17	6.6
Coombe Hill	12	4.7
Gotherington	22	8.6
Highnam	29	11.3
Maisemore	19	7.4
Minsterworth	17	6.6
Norton	13	5.1
Shurdington	29	11.3
Stoke Orchard	18	7.0
Toddington (incl New Town)	15	5.8
Twyning	17	6.6
Woodmancote	18	7.0
SUB-TOTAL	(score) 226	(10%) 88

There are three further allocations (totalling 88), which are the final 10% of the total. These are concerned with: the distances by car; travelling times by bicycle; and bus services; to Gloucester and Cheltenham. Each of these aspects has an equal allocation; one-third of the 10%. Based on the sum of the distance to Gloucester (D_G) and distance to Cheltenham (D_C), one-third of the 88 houses is allocated to the Service Villages; with more houses allocated to villages closer to Gloucester and Cheltenham.

The inputs and results of this part of the calculation are listed in the following table:

Service Village	Distance Sum $D_G + D_C$	Allocation $42.37 / (D_G + D_C)$
Alderton	31.4	1.3
Coombe Hill	12.0	3.5
Gotherington	26.0	1.6
Highnam	16.5	2.6
Maisemore	13.1	3.2
Minsterworth	17.9	2.4
Norton	12.0	3.5
Shurdington	10.7	4.0
Stoke Orchard	16.1	2.6
Toddington (incl New Town)	35.7	1.2
Twyning	34.6	1.2
Woodmancote	20.0	2.1
SUB-TOTAL	(miles) 246	(3.33%) 29.3

A similar calculation is based on the travelling time by bicycle to Gloucester (t_G) and the travelling time by bicycle to Cheltenham (t_C). The inputs and results of this part of the calculation are listed in the following table:

Service Village	Travel Time Sum $t_G + t_C$	Allocation $196.66 / (t_G + t_C)$
Alderton	135	1.5
Coombe Hill	61	3.2
Gotherington	91	2.2
Highnam	75	2.6
Maisemore	67	2.9
Minsterworth	90	2.2
Norton	61	3.2
Shurdington	51	3.9
Stoke Orchard	78	2.5
Toddington (incl New Town)	150	1.3
Twyning	134	1.5
Woodmancote	83	2.4
SUB-TOTAL	(minutes) 1076	(3.33%) 29.3

The final calculation MAIDeN appears to be the output from some work by the GRCC although the source cannot be found. MAIDeN is the Multi-Agency Information Database for Neighbourhoods, which is used by Gloucestershire County Council. The Inform Gloucestershire Local Profiles have replaced reports from the MAIDeN database.

In the following table, the MAIDeN score refers to the bus service from each Service Village to Gloucester and to Cheltenham.

Service Village	MAIDeN Score M	Allocation $0.00744 \times \mathbf{M}$
Alderton	191	1.4
Coombe Hill	554	4.1
Gotherington	337	2.5
Highnam	413	3.1
Maisemore	273	2.0
Minsterworth	428	3.2
Norton	343	2.6
Shurdington	592	4.4
Stoke Orchard	60	0.4
Toddington (incl New Town)	225	1.7
Twyning	60	0.4
Woodmancote	469	3.5
SUB-TOTAL	(points) 3945	(3.33%) 29.3

Based on the inputs and results in the previous five tables, the number of houses allocated to each Service Village can be found from the following equation:

$$\mathbf{Houses} = 0.1535 \times \mathbf{H} + 0.3894 \times \mathbf{F} + 42.37 / (\mathbf{D}_G + \mathbf{D}_C) + 196.66 / (\mathbf{t}_G + \mathbf{t}_C) + 0.00744 \times \mathbf{M}$$

This process could have been improved by adding rules for rounding the results at each stage of the calculation. Thus, if the tables are inspected closely, the numbers of houses may not add up to the total being shared among the Service Villages. In practice, any errors are small.

Applying the above equation (or adding the results from the five preceding tables) gives the number of houses allocated to each Service Village. The results and percentages are listed in the following table:

Service Village	Houses = Result of Equation	Percentage of Total
Alderton	53	4.8%
Coombe Hill	22	14.0%
Gotherington	86	8.5%
Highnam	130	10.5%
Maisemore	41	6.9%
Minsterworth	41	10.9%
Norton	24	8.7%
Shurdington	141	15.0%
Stoke Orchard	27	1.5%
Toddington (incl New Town)	37	5.7%
Twyning	78	1.5%
Woodmancote	201	11.9%
Rounding Error	+ 1	- 0.1%
TOTAL	880	100.0%

The sum of the houses allocated comes to 881, one more than the total being shared. The rounding error calculating the percentages allocated is - 0.1%.

If Apperley had been nominated as a Service Village, how many houses would have been allocated to it? If the number of Service Villages had been 13 instead of 12, would the total number of new houses allocated to the Service Villages have been 880, or a larger number because of the additional Service Village? In the circumstances, all that can be done is to apply the same equation to inputs for Apperley, based on the residential boundary applicable until 2011.

Inputs for Apperley	Symbol	Value	Units
Existing Houses, within 2011 boundary	H	196	houses
Function Score, from settlement audit	F	11	points
Sum of Distances by Car	D_G + D_C	18.8	miles
Sum of Travel Times by Bicycle	t_G + t_C	74	minutes
Bus Service, based on MAIDen database	M	** 90	points

** The score for the bus service is a guess and may well be lower.

To the nearest whole number, the number of new houses that would be allocated to Apperley as an added Service Village would be:

$$\mathbf{Houses = 0.1535 \times 196 + 0.3894 \times 11 + 42.37 / 18.6 + 196.66 / 74 + 0.00744 \times 90 = 40}$$

Since Apperley is NOT a Service Village but one of many "other" villages or settlements in Tewkesbury Borough, we would expect any housing allocation for Apperley to be significantly less than 40; for the period 2011-2031.

Tewkesbury Borough Plan 2011-2031

In the Tewkesbury Borough Plan, Apperley is mentioned as one of three villages that, in the Borough Plan to 2011, had a residential boundary to define “in-fill” in the planning policy for rural villages and settlements.

In the planning policy, a guideline increase of 5% is applied to Apperley and the other two villages mentioned. Based on the number of existing houses in 2011, which is 196 (**H**) from the previous analysis, the allocation of houses would be ten (10).

Expansion of Apperley at Current Rate

In 2020, nine years into the applicable period for the JCS and Borough Plan, the number of new houses already built within or adjacent to the pre-2011 settlement boundary is 21. If this rate were to continue, the number of new houses would reach 46 (rounded down).

Clearly, this estimate of 46 exceeds both the guideline in the Borough Plan (10) and the allocation based on the Service Village calculation (40). This is largely due to the building of 13 affordable homes in 2011 (Oaklands). Therefore, the current rate of expansion might instead be based on new houses without counting Oaklands. This would leave eight (8) new houses over the nine years, from 2011 to 2020.

Based on this rate, we might expect 18 new houses to have been built by 2031 but this ignores Oaklands, which must be added, giving a final total of 31 new houses for the period 2011-2031. This number is as much internally generated as it is allocated from external requirements.