Technical Annex

This annex provides more information on the data used and modelling conducted for important parts of the analysis included in this Impact Assessment.

1. Adjusting English Housing Survey self-reported ground rents data

1.1 Context

1. Analysis in this Impact Assessment (IA) utilises a four-year sample (2020-21 to 2023-24)[1] of self-reported ground rents from the English Housing Survey (EHS) that has been adjusted by MHCLG analysts[2].

2. As noted in the IA for the ground rent consultation (2023)[3], and in the latest EHS leasehold experience fact sheet[4], there are limitations to self-reported ground rent data:
   - "*Cognitive testing undertaken by the EHS team shows that some leaseholders do not know what ground rent is, or confuse it with their service charge. Leaseholders living in flats may be unaware that they pay ground rent because it is included as part of the service charge, while leaseholders living in houses may be unaware of their leasehold status if they do not pay ground rent.*" – EHS 2023 to 2024: leasehold experience fact sheet[5]

   - *"It is possible that ground rents, particularly those in the top quintile, are overestimates of the level of ground rents if survey respondents are confusing ground rents and service charges. For illustration, taking the median (rather than the mean) of the top 20% of ground rents, and removing a very small number of ground rents over £5,000, suggests a median annual ground rent of £480 for the top 20% in England compared to £852 per year using the mean (Table 6). This would mean the estimated impact of the proposed options would be lower."* - Consultation Impact Assessment – Modern leasehold: restricting ground rent for existing leases[6]

   - Some responses to the ground rent consultation, launched in 2023, which cited exceptionally high ground rents also contained answers indicating a misunderstanding or conflation of ground rent with service charge in response to other consultation questions.

   - "*Housing costs in London are undoubtedly higher than in other parts of the country, but some reporting of ground rents in excess of £5,000 per year, as for in other parts of the country, may include some estimates where respondents have conflated total costs, including service charges*" **-** Leasehold and Freehold Charges, April 2020 - Cambridge Centre for Housing & Planning Research[7]

[1] A four-year sample, 2020-21 to 2023-24, is used due to the limited size of the sample of owner-occupier leaseholders that provide ground rent responses in the English Housing Survey, and to smooth year-to-year fluctuations.
[2] Ground rent amounts for Wales are taken from the report 'The Research into the Sale and Use of Leaseholds in Wales'. For details, see Part 2 of this annex
[3] Consultation impact assessment - Modern leasehold restricting ground rents for existing leases
[4] English Housing Survey 2023 to 2024: leasehold experience - fact sheet - GOV.UK
[5] English Housing Survey 2023 to 2024: leasehold experience - fact sheet - GOV.UK, referring to the English Housing Survey methodology paper: cognitive testing of leasehold questions English Housing Survey methodology paper: cognitive testing of leasehold questions - GOV.UK
[6] Consultation impact assessment - Modern leasehold restricting ground rents for existing leases
[7] Leasehold and freehold charges: summary of research findings

3. To further develop the evidence base, MHCLG undertook analysis to verify a sample of self-reported ground rents in the EHS by manually checking against lease documents registered to the same address via HM Land Registry (HMLR). This process resulted in lower estimates of ground rent paid in England, which in turn reduced the department's estimates of the overall size of the ground rent market, the transfer value related to proposals for reform and the number of affected leasehold dwellings from any such reform. The following sections set out the approach and the effect of these adjustments in more detail.

1.2 HM Land Registry records

4. HM Land Registry (HMLR) store leases that outline ground rent terms. These records cover the vast majority of long residential leases in England and Wales, as leases must be registered with HMLR to obtain legal title. The ground rent information contained in these leases is not standardised or digitised, so manual effort is required to read a lease, identify ground rent terms and calculate a relevant annual and updated amount (for example, if escalating terms are present). While information is sometimes incomplete, the lease provides a definitive legal statement on the maximum permissible ground rent payable for a leasehold property, which we assume to be the amount paid in practice.

5. MHCLG analysts therefore requested a sample of leases from HMLR that related to properties in the EHS sample (where the respondent consented for their information to be matched to other data sources).

6. Leases were requested and assessed in tranches, initially focusing on the top end of the EHS ground rent sample (£5,000 annual ground rent or more) where it was thought misreporting was more likely. Analysts requested further samples, eventually obtaining a subset of leases that related to responses across the EHS sample. In total, more than 600 leases were reviewed.

7. Given the manual nature of reviewing leases and deriving up-to-date ground rent amounts, colleagues across MHCLG and HMLR worked to check interpretations and calculations.

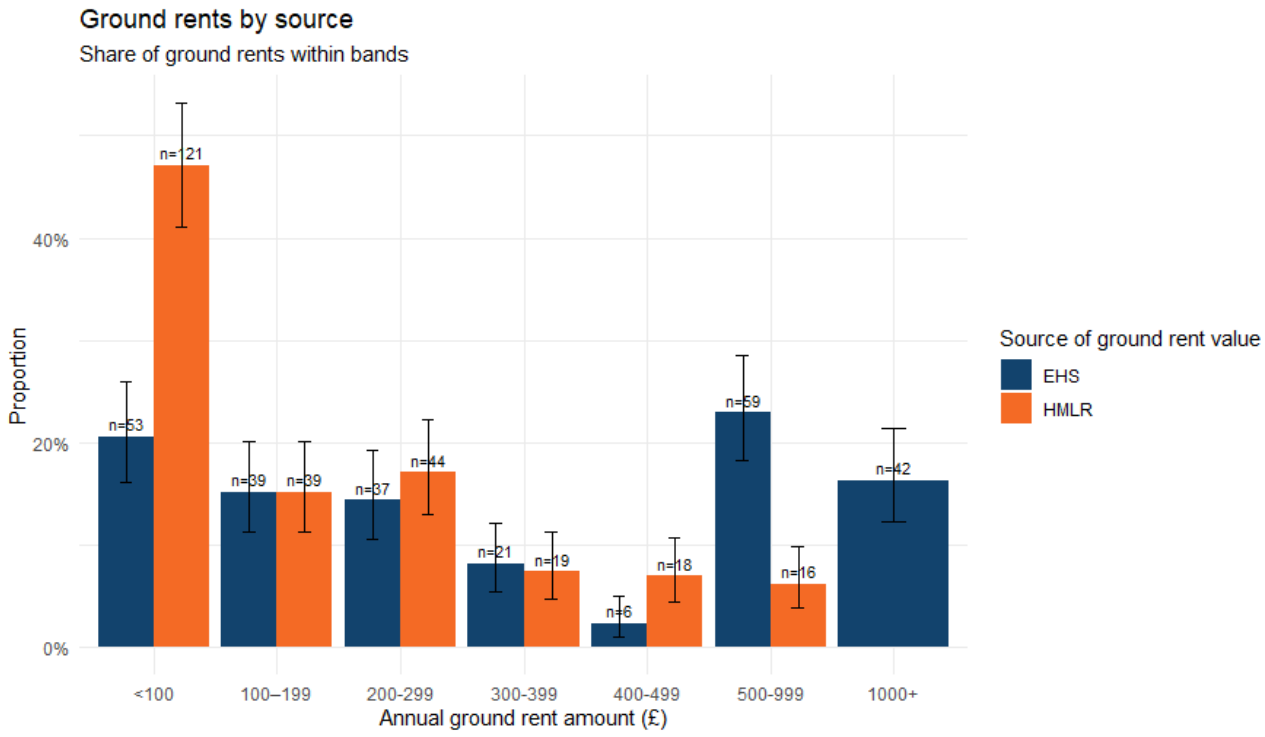
1.3 Results of HMLR matching exercise

8. Once a sample of annual ground rents - derived from HMLR records and spanning the EHS ground rents sample - had been obtained, analysts compared these to the corresponding EHS responses.

Comparing frequencies in the EHS sample and HMLR-derived sample

9. EHS and HMLR ground rent amounts were grouped into bands, and binomial confidence intervals were constructed to represent uncertainty if extrapolating from this sample to all leaseholders. For middle bands the results were similar but at the extreme ends of the distribution the frequencies were significantly different:

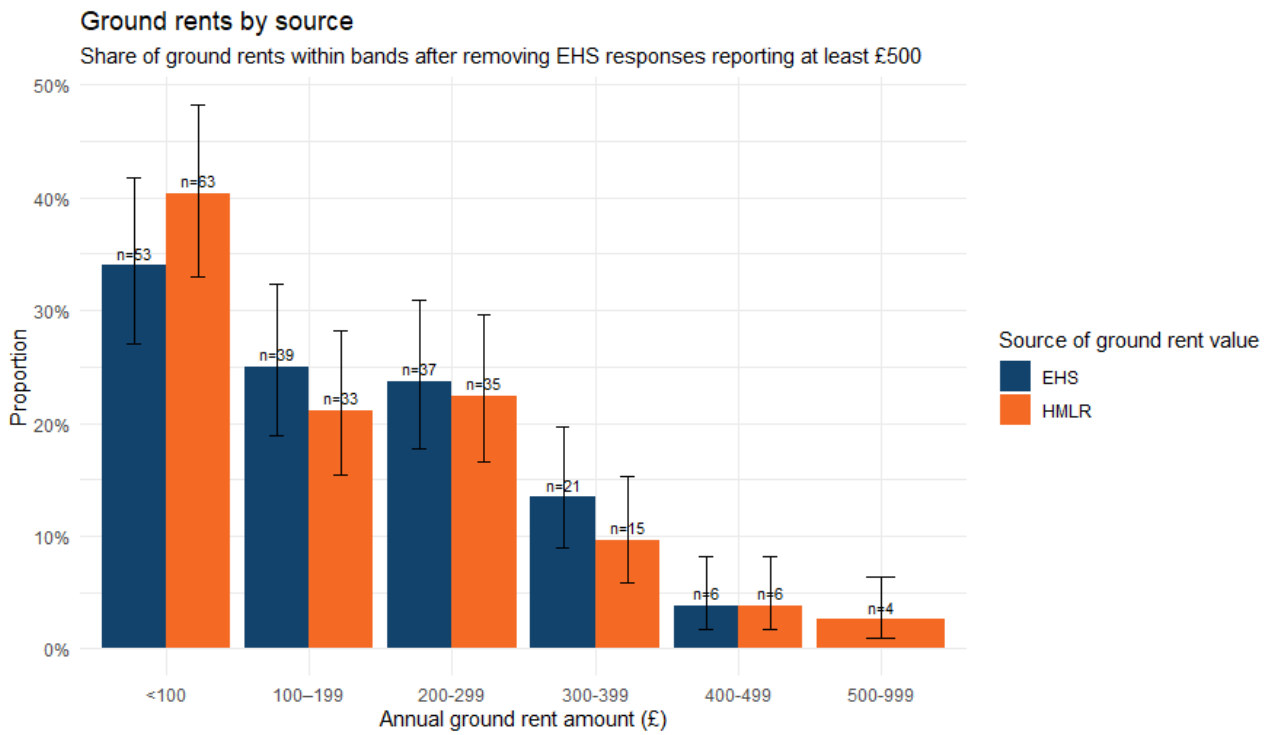
Figure 1:Proportion of ground rents within bands, by source



10. The Stuart-Maxwell test of marginal homogeneity[8] found that the difference between the two samples is statistically significant. Restricting the samples to include only records where rents reported in the EHS are less than £500 brought the two measures into closer alignment, and the difference is no longer statistically significant. This effect is demonstrated in Figure 2:

[8] A non-parametric statistical test used for paired categorical data arranged in a square contingency table (same categories measured twice)

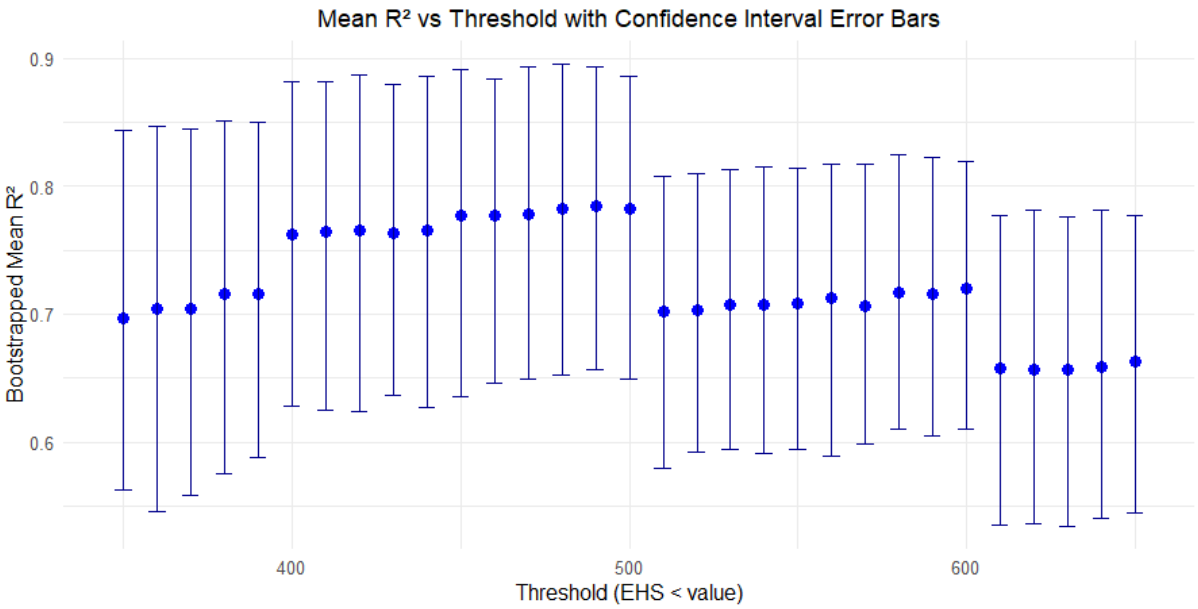
Figure 2: Share of ground rents within bands after removing EHS responses reporting at least £500, by source



Assessing the relationship between the sources below a given EHS-ground rent threshold

11. R^2 values were calculated for comparisons between the averages of the EHS and HMLR-derived ground rent figures for all values under a given threshold (i.e. comparing EHS to HMLR for all cases where EHS ground rent estimates were under £450, then £460, £470, etc.). A bootstrapping approach was used to calculate the mean R^2 values and associated 95% confidence intervals. The comparisons were calculated at £10 intervals. At each threshold the data was sampled 1,000 times with replacement. **Figure 3** shows that the mean R^2 value increases as the threshold approaches EHS ground rent values of £500 before decreasing as values over £500 are included. While it is not definitive that the correlation between EHS and HMLR is greatest when the EHS ground rent amount is less than £500 (there is overlap between the confidence intervals and data for all thresholds), the general pattern suggests a peak in agreement between EHS and HMLR values at this level.

Figure 3: Mean R^2 value where the sample is constrained to records where the EHS response is less than a given threshold



12. These results suggest misreporting is greatest when self-reported ground rent is £500 or higher; for lower amounts, EHS and HMLR amounts generally match well at both record and aggregate levels.

Data and assumptions

13. Following the HMLR matching exercise, MHCLG built a dataset based on the original four-year ground rent sample from the EHS with comparable HMLR amounts for a selection of records: where general permission for data matching had been granted by the respondent, leases were requested for all households that reported paying £500 or more.

14. Ground rent averages in the EHS are calculated following routing in the survey and subsequent data cleaning to ensure the averages are based on a sample that meets the following criteria:
    a) Records must relate to a flat or a house.
    b) The respondent must be an owner occupier recording their tenancy as being 'Leasehold' or 'Both Leasehold and Share of Freehold'.
    c) The respondent must have reported that they pay ground rent.

15. There were 1,845 records within the four-year sample that fit these criteria.

16. Based on the results of the HMLR matching, filters were applied by MHCLG analysts:

17. Comparisons to HMLR records indicated that respondents who reported being shared owners generally do not accurately report the amount of ground rent they pay – likely due to a conflation with other rent obligations.
    d) The respondent must not have reported being a shared owner.

18. Additional and routine checks against HMLR leases are conducted by the EHS team for their leasehold dwellings estimates. In some cases, respondents reported in the EHS that they are a leaseholder, while the EHS team's check against HMLR records found

them to be a freeholder. Where this was the case, the record was removed from the sample.

e) Routine checks against HMLR leases, conducted by the EHS team, did not find the respondent to be a freeholder.

19. Finally, the department's matching exercise found that 37 respondents that reported paying a ground rent of £500 or more had no ground rent obligation according to their lease. These were filtered out of the sample.

f) Where ground rent was reported to be at least £500, there must not be evidence from the HMLR matching exercise that the respondent does not have a ground rent obligation.

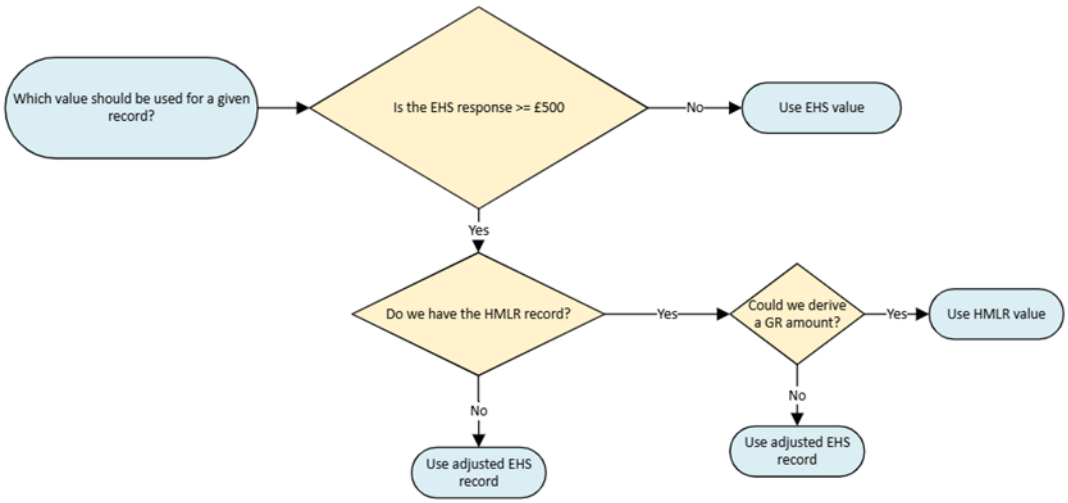
20. After applying the above criteria, the sample contains 1,598 records.

Treating responses greater than or equal to £500 per annum

21. Of the 1,598 records in the refined sample, 158 had an EHS-reported ground rent figure of at least £500. HMLR-derived ground rent amounts were available for 101 of those records (64%) but were not available for 57 (36%) – either because the respondent did not grant permission for their data to be used in further research, a lease matching the property couldn't be found in HMLR records, or because the ground rent amount could not be derived from a lease due to insufficient information.

22. Analysis showed that, below £500, the EHS sample was sufficiently reliable. Considering this, and that EHS data are fully digitised and analysis-ready, the following process was employed to determine which ground rent amount should be used for each respondent:
    1. If the EHS response is less than £500 per annum, use the EHS response. Else:
    2. Use the HMLR-derived amount **if it was available**. Else:
    3. Impute the ground rent amount by adjusting the EHS response using the observed relationship between EHS responses and HMLR-derived amounts.

Figure 4: Flow chart showing the selection process for ground rent figures



Adjustment methods

23. Methods to impute ground rent amounts for the relevant 57 records were explored. Analysis focused on developing and evaluating versions of two methods: Ratio of Means (RoM) and Mean of Ratios (MoR).

24. The methods use an adjustment factor which is applied to the EHS ground rent amount when no ground rent information could be derived from HMLR records.

25. The adjustment factors are derived using a *matched* sample, where ground rent amounts are available from both sources. The matched sample is a subset of the wider, refined ground rent sample (1,598 records) and the same assumptions are applied with two exceptions:

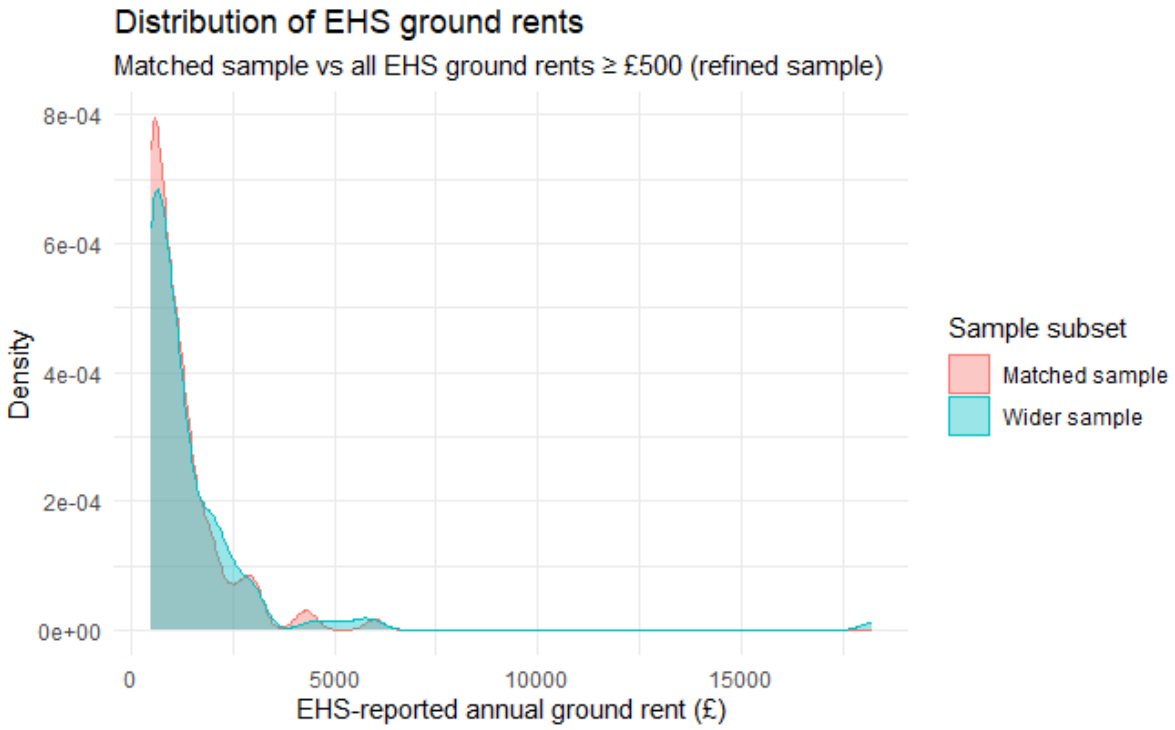
26. **Exception 1:** The ground rent amount reported in the EHS must be at least £500.

27. **Exception 2:** Contrary to the earlier assumption (f), we allow the inclusion of those respondents whose lease showed evidence of no ground rent obligation. Assuming there is no inherent difference between the 57 records for which HMLR ground rent information could not be derived and those where HMLR ground rent information could be derived, it is likely that some of the 57 records would not have a ground rent obligation (as was found for a proportion of those records where HMLR information could be derived). Retaining these cases in the latter group will allow the adjustment factors to reflect this effect

28. Applying assumptions (a) to (e) and exceptions 1 and 2 yields a ‘matched’ sample with 101 records.

29. Exploratory analysis was conducted to confirm that the EHS responses within the matched sample reflected, in distribution, the 57 EHS responses that required adjusting.

Figure 5: Density plot comparing the distribution of EHS ground rents in the matched sample against all EHS ground rents greater than or equal to £500 in the refined sample



Ratio of Means:

30. Uses the ratio of average EHS ground rent in the matched sample, and average ground rents derived from the corresponding HMLR leases:

$$\text{Adjustment Factor} = \frac{\frac{1}{n}\sum_{i=1}^{n} \text{EHS}_i}{\frac{1}{n}\sum_{i=1}^{n} \text{HMLR}_i}$$

31. Where:
    - n is the number of records within the stratum
    - EHS_i is the self-reported ground rent amount, per the EHS, for respondent i
    - $HMLR_i$ is the ground rent amount derived from the lease, per HMLR records, for respondent i

Mean of Ratios:

32. Uses the average ratio of records' ground rent according to the EHS, and ground rent derived from the corresponding HMLR lease, within the matched sample:

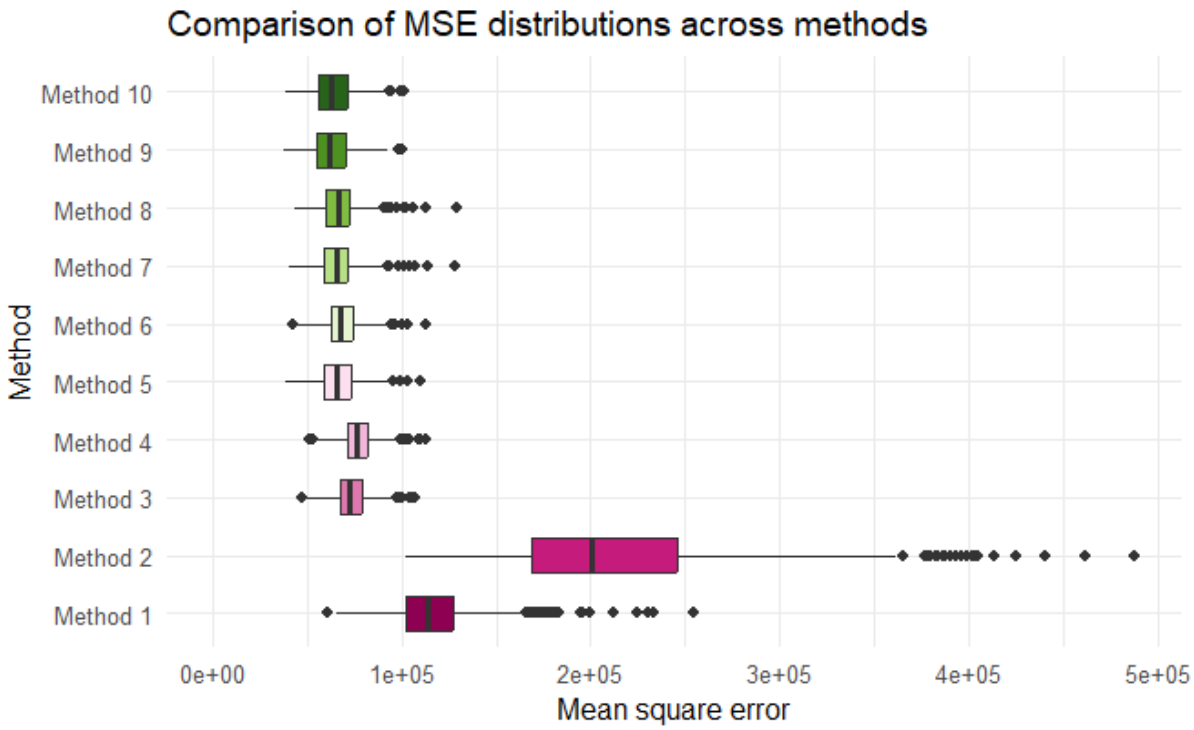
$$\text{Adjustment Factor} = \frac{1}{n}\sum_{i=1}^{n}\left(\frac{\text{EHS}_i}{\text{HMLR}_i}\right)$$

33. Adjustment factors were calculated using 1 to 5 strata for each method. Where more than one stratum was used, additional exploratory analysis was conducted to confirm that EHS responses within the matched strata aligned, in distribution, with those in the strata that were to be adjusted.

34. Mean Square Error (MSE) measures the squared difference between predicted values (adjusted EHS ground rents) and actual values (assumed to be the HMLR-derived ground rent amounts).

35. A simulation study was conducted to test the performance of each of the ten method variations using the matched sample, which was randomly split into training and test sets. Calculating the MSE after each repetition yielded comparable MSE distributions for each method.

Figure 6: Comparison of MSE distributions across methods



36. Method 9 (RoM with 5 strata) consistently showed the lowest median and quartile MSEs in the simulation study, so analysts chose it to adjust the remaining 57 records.

Selected adjustment method (Adjustment Approach 1 – AA1)

37. Starting with the four-year EHS average ground rent sample (1,845 records):
    - Apply assumptions (a) to (f) (1,598 records):

        a) Records must relate to a flat or a house
        b) The respondent must have recorded their tenancy as being ‘Leasehold’ or ‘Both Leasehold and Share of Freehold’
        c) The respondent must have reported that they pay ground rent
        d) The respondent must not have reported being a shared owner
        e) Routine checks against HMLR leases, conducted by the EHS team, did not find the respondent to be a freeholder
        f) There must not be evidence from the HMLR matching exercise that the respondent does not have a ground rent obligation

    - If EHS amount < £500, use EHS amount
    - If EHS amount >= £500, use the HMLR-derived amount if available

- Else, adjust the EHS amount:
    - If EHS ground rent in [£500, £520), multiply by 0.77181
    - If EHS ground rent in [£520, £699), multiply by 0.31751
    - If EHS ground rent in [£699, £1,099), multiply by 0.18742
    - If EHS ground rent in [£1,099, £1,680), multiply by 0.10156
    - If EHS ground rent is greater than or equal to £1,680, multiply by 0.03124

Selected adjustment method (AA2 – AA4)

38. AA1 relies on a number of assumptions, as discussed throughout this section. Further uncertainty is present due to the limited size of the adjusted four-year sample[9]. Given the impact of the adjustment on average ground rents and modelling outputs – as will be discussed later – analysts explored alternative treatments for the 57 EHS responses that were at least £500 and where no HMLR-derived amount was available. **Table 1** summarizes the options considered.

Table 1: Approaches to adjusting EHS responses of £500 more when the HMLR amount was not available

Adjustment Approach	Description	Pros	Cons
Adjustment Approach 1 (AA1)	This approach is the product of extensive statistical work to identify a suitable adjustment. A 'Ratio of Means' approach was taken using the ratio of average ground rents in the EHS to average ground rents as derived from HMLR records from the sample of records that we have been able to match.	Analytically objective	Subject to inherent uncertainty (as are AA2 – AA4)
Adjustment Approach 2 (AA2)	Retain the EHS response where there were incomplete or missing records from HMLR on the assumption there could be something different about these leases (29 records). Where analysts did not attempt to match (because they lacked respondent permission or lacked the details to find a HMLR lease), continue to adjust EHS responses as in AA1, on the assumption that this group is unlikely to be substantially different from those we did match (28 records).	Accounts for the underestimation uncertainty	The rationale behind this grouping is not substantially supported by evidence and outliers have a large impact on results
Adjustment Approach 3 (AA3)	As AA2, except assign adjustment and retainment randomly across the remaining 57 records, assuming a 50/50 split between	Random assignment is more objective and is more robust to the	While proportionate, the 50/50 split

[9] Limitations are discussed in more detail later in this annex

	the two groups. Run the process 1,000 times and take the average.	impact of outliers remaining in the sample	is an arbitrary assumption
Adjustment Approach 4 (AA4)	Keep the EHS reported value for all 57 records, assuming all these values were reported correctly.	Provides an absolute upper bound of impact based on data that it available	Given the extent of misreporting, it is likely this would be an overestimate.

39. Due to the inherent uncertainty around the data, analysts determined that a range should be presented when considering average ground rent and the impacts of different reform options. Based on the pros and cons outlined above, ranges are constructed using AA1 and AA3, as this balances the uncertainty in a way that is analytically objective and does not require unevidenced assumptions.

Impact on ground rent reform modelling

40. MHCLG relies on ground rent data when:
    1. Calculating average ground rents;
    2. Estimating the value of the transfer from freeholders to leaseholders by implementing ground rent reform; and
    3. Estimating the number of leasehold dwellings that will benefit from ground rent reform.

41. The impact on each is explored below.

Impact of adjustments on ground rent averages

42. Applying AA1 and AA3 lowers average ground rent estimates. AA4 serves as a sensitivity check, demonstrating the impact of using the EHS figure where a HMLR amount had not been obtained. Sample trim methods at £500 and £2,000 demonstrate the effect of a basic outlier treatment (average ground rent is based on EHS records that satisfy assumptions (a) to (f) and report paying less than £500 and £2,000 in ground rent, respectively). The baseline is derived from the unadjusted EHS four-year sample of ground rents after applying assumptions (a) to (f)

Table 2: Mean ground rents using different sample adjustment methods

Sample cut	Mean annual ground rent 2020-21 to 2023-24					
	Baseline (EHS, unadjusted)	AA1	AA3	AA4 (sensitivity)	Sample trim (£500) (sensitivity)	Sample trim (£2k) (sensitivity)
All sample	£299	£124	£153	£182	£116	£161
Top 20%	£1,080	£343	£437	£561	£320	£464
Bottom 80%	£82	£69	£67	£67	£64	£66

Table 3: Median ground rents using different sample adjustment methods

Sample cut	Median annual ground rent 2020-21 to 2023-24					
	Baseline (EHS, unadjusted)	AA1	AA3	AA4 (sensitivity)	Sample trim (£500) (sensitivity)	Sample trim (£2k) (sensitivity)
All sample	£100	£80	£95	£95	£75	£98
Top 20%	£500	£300	£350	£350	£300	£350
Bottom 80%	£50	£40	£35	£35	£25	£30

Impact of adjustments on transfer value estimates

43. Regionally disaggregated (North, Midlands and East, London and South) average ground rents are a key input into MHCLG's modelling of the value of the transfer from freeholders to leaseholders as a result of ground rent reform. Therefore, the estimated transfer value is affected by the choice of adjustment method. In the table below, the peppercorn policy option represents the estimated size of the ground rent market in England and Wales.

Table 4: Estimated transfer value using different sample adjustment methods

Policy option	Transfer value (2025 prices, 2028 present value)					
	Baseline (EHS, unadjusted)	AA1	AA3	AA4 (sensitivity)	Sample trim (£500) (sensitivity)	Sample trim (£2k) (sensitivity)
Peppercorn	£41.2bn	£18.3bn	£20.7bn	£24.3bn	£17.2bn	£22.1bn
Initial £250 cap, peppercorn in 40 years	£33.0bn	£10.0bn	£12.7bn	£16.5bn	£9.2bn	£14.0bn

Impact on the estimated number of leasehold dwellings affected by ground rent reform.

44. The ground rents sample is used to estimate the number of leasehold dwellings that will benefit from ground rent reform – both immediately (within this parliament) and over the lifetime of the policy. Estimates are derived by measuring records within the sample with ground rent amounts greater than the cap and applying relevant weightings and multipliers to obtain a population-level estimate.

Table 5: Estimated number of leasehold dwellings immediately affected by ground rent reform using different adjustment methods

Policy option	Leasehold dwellings impacted (day 1)					
	Baseline (EHS, unadjusted)	AA1	AA3	AA4 (sensitivity)	Sample trim (£500) (sensitivity)	Sample trim (£2k) (sensitivity)
Peppercorn	3.8m	3.8m	3.8m	3.8m	3.8m	3.8m
Initial £250 cap, peppercorn in 40 years	1.1m	770,000	900,000	910,000	760,000	930,000

Quality assurance and limitations

45. The approach set out in this section was developed and tested by analysts at MHCLG and was subject to extensive quality assurance efforts including review and sign-off from an independent senior statistician from a different part of the department.

46. While the adjusted dataset is the product of robust methodology which has been appropriately scrutinized, it is necessary to acknowledge that there remain some limitations to the approach:
    - The four-year sample of 1,598 records is small compared with the size of the population of leaseholders that pay ground rent. Therefore:
        - There is a risk of overfitting and reduced sample variability, particularly between groups, for example regions, or houses/flats.
        - It is likely that low incidence, high ground rents would not have been picked up in the sample; however, the absence of these higher rents from the sample suggests that they are likely to make up only a very small percentage of all leaseholders in the overall population and are unlikely to meaningfully influence the overall averages.
    - Similarly, while the adjustment aims to accurately impute values for the 57 records reporting more than £500 in ground rent, and where no ground rent amount could be derived from HMLR records based on the evidence available to us, there remains a possibility that these reported values are correct. If this were the case, these would have an outsized impact on the averages.
    - The method uses the ground rent amount derived from HMLR information if the EHS response was greater than or equal to £500, and if HMLR information was available. While the lease provides a definitive legal statement on the maximum permissible ground rent payable for a leasehold property, it may be the case that the leaseholder pays a different amount in practice.

47. As discussed earlier, in acknowledgment of the uncertainty around the data, averages and impacts are presented as a range (method AA1 – method AA3).

Further work

48. We welcome additional evidence through the pre-legislative scrutiny process and will continue to develop our estimates for a final impact assessment.

2. Modelling approach and key assumptions underpinning ground rent cap transfer estimate

49. This section details the methodology and assumptions underpinning the ground rent reform impacts, which makes use of the adjusted EHS ground rent data set out in the previous section.

a. Modelling approach

50. In broad terms, the modelling does the following:

- Uses adjusted average ground rents from the EHS and lease length information from HM Land Registry (HMLR) to calculate the net present value of the stream of future ground rents. This is calculated for two scenarios:

    A. **The baseline** – i.e. determine how much ground is paid by leaseholders to freeholders (discounted and deflated into consistent prices) absent of any policy intervention,

    B. **The policy** – i.e. implements the ground rent cap of interest and calculates how much ground rent would still be paid by leaseholders to freeholders over the lifetime of leases.

- The model calculates the difference between the baseline and the policy (A – B) to estimate the overall **transfer value** due to the ground rent cap. This represents the impact of the intervention (i.e. the financial transfer from freeholders to leaseholders arising from the chosen cap).

- All impacts are presented with a present value year of 2028, discounted with the Green Book standard discount rate of 3.5% declining after 30-years. Throughout the impact assessment, the transfer is presented as the change in cash flows over a 10-year appraisal period and over the lifetime of leases.

b. Key assumptions

51. This section sets out the key assumptions underpinning the monetisation of the transfer value from freeholders to leaseholders arising from the cap.

i. Total number of leasehold dwellings

52. We assume there are approximately 5.1m leasehold dwellings across England and Wales. This is based on:

- The 2023/24 Leasehold Dwellings publication from MHCLG, which estimates there are 4.83m leasehold dwellings in England (3.48m flats and 1.35m houses).[10]
- Research conducted by the Welsh government, which estimates there are approximately 235,000 leasehold properties in Wales.[11]

53. This figure is assumed to be the number of leasehold dwellings at the point of implementation in 2028.

[10] Leasehold dwellings, 2023 to 2024
[11] Research into the Sale and Use of Leaseholds in Wales, 2021

ii. Proportion of leaseholders paying ground rent

54. According to the EHS, the majority of owner-occupying leaseholders reported paying a ground rent in 2023-24 – 76.9% in England, though there is notable regional variation (see **Table 2**).[12] An equivalent figure for Wales specifically is not available, so we assume the England-level percentage (76.9%) applies. Applying these percentages to our dwellings assumptions gives an estimate of 3.8m leasehold properties with a ground rent obligation.

Table 6: Proportion of leaseholders paying ground rent, by region, 2023-24

Region	Percent
North East	76.2
North West	91.5
Yorkshire and the Humber	71.0
East Midlands	82.8
West Midlands	58.9
East of England	84.3
London	74.0
South East	67.2
South West	68.0
England	**76.9**

iii. Number of leases with variable ground rents

55. There are a wide variety of ground rent terms in the population. Some leaseholders pay a fixed ground rent that does not escalate over time. Others pay a variable ground rent that increases over time at regular intervals specified in the lease. Precise data on the composition of ground rent terms in leases across the population is limited.

56. We assume **that 50% of all leases are variable.** This is made up of:

i. **18% of all leases which are *high* in value and escalating**. This stems from an assessment of the leasehold market from the CMA, who identify 778,000 new-build leasehold properties sold between 2000 and 2020.[13] 778,000 represents 18% of the 4.3m leasehold dwelling stock at the time. The CMA identifies these new-builds as "modern long lease properties with annual ground rents typically at several hundred pounds and usually increasing over the term of the lease." As such, we assume all leases granted on new builds since 2000 have variable terms with high levels of ground rent, which equates to 18% of the stock. This assumption is consistent with the Ground Rent Consultation Impact Assessment.

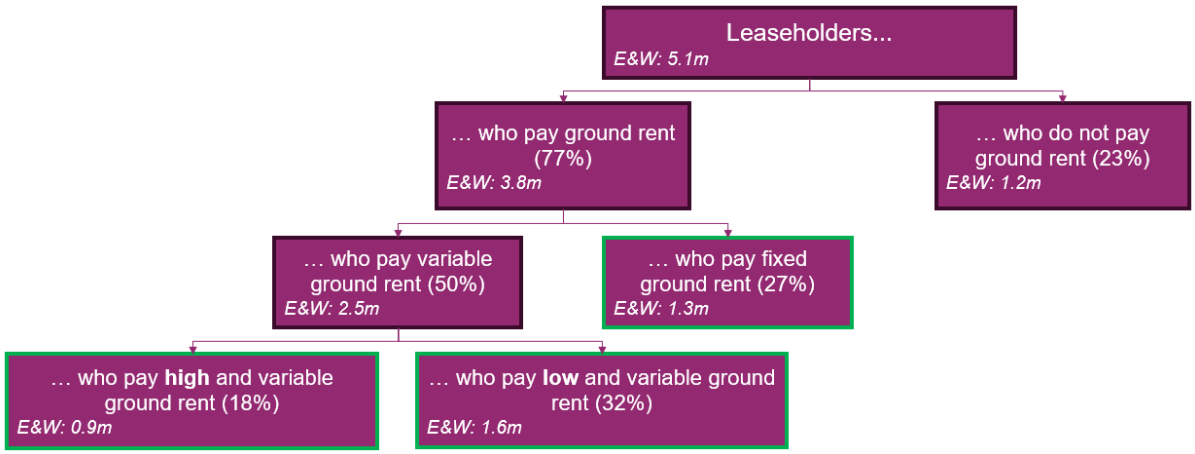
ii. **32% of all leases which are *low* in value and escalating**. The government received feedback via the Ground Rent Consultation from certain freeholders that 18% was too low, citing evidence from their own portfolios that a much higher proportion than 18% of leases were variable and that this included variable ground rents that were introduced before 2000. Based on the consultation responses we

[12] English Housing Survey 2023 to 2024: leasehold experience - fact sheet
[13] Leasehold housing, CMA (2020)

have adjusted our assumption to reflect a greater share of escalating leases in the population, which now includes 32% of all leases which are low in value but escalating over time (such that the total proportion of escalating leases in our modelling is 50%). This strikes a balance between reflecting the consultation feedback and recognising that escalating leases are likely to be overrepresented in the portfolios of large freeholders responding to the consultation.

57. Across England we assume that around 23% of all leases pay no ground rent. It follows, in combination with the assumptions above, that there are a further 27% of all leases that pay a fixed ground rent. **Figure 7** visualises this segmentation of the leasehold population. We assume these proportion splits hold for both England and Wales.

Figure 7: Assumed leaseholder population segmentation[14]



58. Given the limited leasehold data landscape, there is uncertainty around these assumptions. We vary these assumptions in our sensitivity testing section.

iv. Average ground rents

59. The analysis uses estimates of ground rents from the EHS, adjusted in line with the HMLR data verification exercise detailed above. As a result of this work our overall estimate of ground rents paid in England has reduced, although the median ground rent is less affected. The most notable reduction occurs in the top 20% of ground rents. Please see **Table 7** for a breakdown of ground rent averages (pre- and post-adjustment, mean and median) across different regional groups at different points in the distribution.

60. Due to uncertainties reflected in the different adjustment approaches, we present an upper and lower bound estimate for newly adjusted ground rent averages. Please see section one of this technical annex for full details on the adjustment exercise. Average ground rent estimates have been calculated using a four-year sample, covering the period 2020-21 to 2023-24. This four-year period smooths year to year fluctuations and increases the sample size sufficiently to calculate average ground rents for three regional areas (the North, the Midlands, and London and the South).

[14] NB: all percentages presented have the full England and Wales leasehold stock as the denominator.

61. The top 20% of ground rents in the sample has been used to estimate average ground rents in the high and escalating group. The bottom 80% of ground rents in the sample has been used to estimate average ground rents in the low and escalating and fixed groups. In our modelling, variable ground rent averages are uprated to expected 2028 values using RPI forecasts and all ground rent averages are deflated to constant 2025 prices using the GDP deflator.

Table 7: Average ground rent, 2020-21 to 2023-24

		Mean			Median		
		Unadjusted Baseline	Adjusted		Unadjusted Baseline	Adjusted	
			Lower	Upper		Lower	Upper
Full sample	North	£108	£74	£78	£22	£25	£25
	Midlands	£345	£155	£208	£156	£125	£130
	South	£446	£157	£199	£150	£120	£140
	England	£299	£124	£153	£100	£80	£95
Top 20%	North	£630	£318	£337	£425	£300	£300
	Midlands	£1,064	£350	£512	£480	£300	£325
	South	£1,201	£347	£440	£500	£330	£350
	England	£1,080	£343	£437	£500	£300	£350
Bottom 80%	North	£55	£49	£48	£15	£18	£17
	Midlands	£110	£89	£87	£100	£90	£80
	South	£100	£83	£80	£100	£67	£50
	England	£82	£69	£67	£50	£40	£35

62. Survey findings from “The Research into the Sale and Use of Leaseholds in Wales” report find the median ground rent for flats to be £150 per annum and £200 for houses.[11] We have not been able to establish an average variable and fixed ground rent for Wales, so we have assumed this median is the same for both for both the variable and fixed ground rents. In reality, the two will likely differ.

63. Please note, given we do not have access to the data underlying these estimates, we have not carried out a verification exercise on these Welsh ground rent averages. We welcome additional evidence on ground rents in Wales through the pre-legislative scrutiny process.

v. Frequency of ground rent reviews

64. For the 50% of leases we assume have escalating ground rent terms, we assume, for the purposes of the modelling, that ground rents are reviewed annually. However, some consultation responses suggested this did not reflect the actual distribution of lease review periods and evidence suggests that ground rent review periods vary widely from annual, 5 years, 10 years or more. While there is still a large amount of uncertainty as to an average period across all leases, it will be the case that a different cohort of leaseholders will experience ground rent increases in each year, as cohort-specific review periods are surpassed. Therefore, we judge this to be a proportionate modelling approach to reflecting ground rent increases across the caseload. We show the impact of this assumption in the sensitivity analysis section of **Annex 5.**

65. We assume ground rents increase according to the RPI up to 2030.[15] From 2031 onwards, RPI and the Consumer Prices Index including owner occupiers' housing costs (CPIH) will converge, hence we assume variable ground rent terms increase with CPIH from this point.[16]

vi. Lease lengths

66. Analysis of HM Land Registry data has been used to estimate the distribution of remaining time on leases across the stock, filtering out leases granted with less than 21 years.[17] These data are available for England and Wales.

67. These data are provided in buckets of varying lengths for each region. For the purposes of modelling, the midpoint of these buckets is used. For example:
    - For the 70-80 years bucket, 75 years is chosen.
    - This is used to establish the discounted and deflated sum of ground rent payments for a representative leaseholder with 75 years remaining on their lease.
    - This is done for each region. From the HMLR data we know how many leasehold dwellings are in the North West and have 70-80 years remaining on their lease. We use this information to scale up ground rent payments to a caseload total.
    - This is done for each bucket and region and summed across the entire population to ascertain overall ground rent flows.

vii. Property prices

68. The modelling uses median house prices by property type and per region, as per the Office for National Statistics, covering the year ending December 2024.[18] House prices have been uprated to their expected 2028 value in line with House Price Index forecasts from the OBR, and then deflated into constant 2025 prices using the GDP deflator.

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[15] Economic and fiscal outlook – November 2025, OBR
[16] Supplementary forecast information on Long-term economic determinants and personal independence payment policy costing, OBR, 2025
[17] For details of this approach, see the 'Land Registry Title data project outputs – detailed methodology' section of the Leasehold and Freehold Reform Bill Impact Assessment (2023). The same methodology was used here employing 2024 data.
[18] Median house prices for administrative geographies, ONS

3. Details on estimating and monetising the potential impact of the proposed ground rent reform on property transactions

Number of fall throughs due to ground rent terms

69. Annually, there are around 1.1m residential property transactions in England and Wales[19]. Leasehold transactions are estimated to account for 23% of annual transactions across England and Wales[20] - approximately 246,000. According to TPXimpact analysis for MHCLG, an estimated 33% of potential property transactions fail. Assuming there are 246,000 leasehold completions annually, and that 33% of attempts fall through, the total number of attempted transactions is around 367,000 and the number of annual fall throughs is approximately 121,000.

70. We estimate that around 770,000 to 900,000 leasehold properties in England have annual ground rent greater than £250[21] (and we assume that the number for England and Wales is not significantly different for these purposes). With an estimated 5.1m leasehold dwellings across England and Wales, this represents around 15%-18% of leasehold stock.

71. Evidence indicates that difficulties in buying or selling leasehold properties often arise when ground rents that are greater than 0.1% of the property value annually - around £250 on average, and / or where ground rents escalate. The policy statement[22] and ground rent consultation IA[23] set out the issues for this group.

72. We assume that fall throughs due to ground rent terms occur due to difficulties securing a mortgage, and that the ground rent cap removes this risk[24]. Quick Move Now[25] indicate that 33% of fall throughs in 2025 occurred due to difficulties in securing a mortgage. Applying this share to the estimated 121,000 fall throughs yields an estimate of 39,988 mortgage-related fall throughs.

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[19] Calculated in February 2026 using the 2020-21 to 2024-25 average for England and Wales, Table 1: Monthly property transactions completed in the UK with value of £40,000 or above - GOV.UK

[20] Leasehold housing in England: Statistics - House of Commons Library

[21] Addressing unregulated and unaffordable ground rent, Table 2

[22] "*According to UK Finance data set out in part 2 of lending policies, only one of the 12 major lenders did not explicitly reference either £250 or 0.1% within their mortgage lending rules. Higher ground rents also impact on the saleability of homes – we have heard cases where this can result in leaseholders being unable to move home to start a new job or delaying decisions around starting a family. A survey from the Association of Leasehold Enfranchisement Practitioners found that 81.8% of members agreed that "ground rents have a negative or undesirable effect on the sale of leasehold properties", with a majority agreeing this was driven by mortgage availability.*" Addressing unregulated and unaffordable ground rent

[23] *78% of property agents reported in a recent survey by Propertymark that properties with an escalating ground rent are struggling to sell, meaning people who want to move are currently prevented or delayed from doing so Consultation impact assessment - Modern leasehold restricting ground rents for existing leases*

[24] Similarly, among mortgage-related fall throughs where the lease has high ground rents, we assume that the high ground rents are the reason for not securing a mortgage. In some instances, buyers will fail to secure a mortgage for other reasons, even if ground rents are high.

[25] "Quick Move Now buy and sell hundreds of properties each year and the fall through statistics are calculated month-on-month, quarterly and annually." House Sale Fall through stats | 2018 - 2025

Approach 1:

73. Given that we assume fall throughs due to ground rent terms occur due to difficulties securing a mortgage, one approach to estimating their number would be to take c15%-18% of 39,988, giving 6,037-7,057.

74. However, if high ground rent terms are a reason for transactions falling through, one would expect these leases to appear more predominantly amongst transactions that have fallen through compared with the population of leases in general.

Approach 2: conditional probability:

75. To estimate the number of fall throughs that occur because of high ground rent terms, we compute the conditional probability of a mortgage-related fall through, given that the lease has an annual ground rent amount greater than £250. Among mortgage-related fall throughs, the share attributable to having high ground rent terms can be shown to be:

$$\frac{rp}{rp + (1 - p)}$$

76. Where:
    - p is the percentage of leases with annual ground rent greater than £250 – c15% or c18%.
    - r is an uplift indicating how many times more likely a mortgage-related fall through is for leases with high ground rents compared with leases without such terms. With no uplift, r = 1, the share of fall throughs, amongst those that are mortgage related, that are attributable to ground rents is p (15-18%) (this is equivalent to Approach 1, above). If high ground rent increases the risk of a mortgage-related fall through (i.e. r > 1) the conditional share rises above p. We make stylised assumptions about the value of r to estimate the number of ground-rent related fall throughs.

    - r = 1 (i.e., no uplift – the presence of high ground rents does not impact the probability of a fall through with mortgage difficulties);
    - r = 1.5 (i.e., high ground rent leases are 50% more likely to fall through with mortgage difficulties);
    - r = 2 (i.e., high ground rent leases are twice as likely to fall through with mortgage difficulties); etc.

Assumed uplift	Share of mortgage-related fall throughs attributable to high ground rents	Estimated annual number of fall throughs due to ground rents
r = 1 (equivalent to Approach 1)	15%-18%	6,037-7,057
r = 1.5	21%-24%	8,420-9,727
r = 2	26%-30%	10,491-11,996
r = 2.5	31%-35%	12,306-13,949
r = 3	35%-39%	13,911-15,647

77. There is considerable uncertainty around the value of r. For a low estimate, we use Approach 1, noting that while we expect the value of r will greater than 1 in practice, we also acknowledge that not all leaseholders with ground rents of £250 or more will necessarily face mortgage-related issues (see Annex 5 for further details). To account for uncertainty, we round to the nearest 5,000 transactions, giving a low estimate of 5,000. To obtain a central estimate, we assume that a mortgage-related fall through is 50% more likely if the lease has a ground rent of £250 or more (r = 1.5) and rounding to the nearest 5,000 transactions produces an estimate of 10,000 transactions. For the upper estimate, we assume an additional 5,000 transactions: 15,000 in total. This corresponds to an r value of around 2.5 to 3.

Costs of fall throughs

78. A 2017 BEIS call for evidence on the home buying and selling process found the mean average cost of a failed transaction in 2017 to be £720 for buyers and £660 for sellers[26]. Assuming costs rose with CPI between the estimates and now, these equate to £965 for buyers, £884 for sellers in 2025 prices. 56% of buyers and 44% of sellers who experienced fall throughs incurred wasted costs.

Total benefit

79. The benefit to households is the money they save from transactions not falling through. This can be quantified over a ten-year appraisal period by calculating the cost of would-be fall throughs throughout the period. This is calculated as the average cost to buyers and sellers per fall through (in 2025 prices) times the percentage of buyers and sellers that experience wasted cost from fall throughs (56% and 44%, respectively) times the number of fall throughs expected to occur each year – 10,000 (5,000 – 15,000). There are of course other benefits from transactions not falling through, but here we focus on and monetise only the direct financial savings.

80. Discounting is applied, per HM Treasury's Green Book. The total value of the benefit to buyers and sellers across the appraisal period is estimated to be £80m (£40m - £120m)

Proof of formula

81. Among mortgage-related fall throughs, the share with high ground rent terms is:

$$\frac{rp}{rp + (1 - p)}$$

Proof

Let H denote the event that a lease has annual ground rent greater than £250 (and H' represents the event that a lease a lease does not).

Define $p \coloneqq P(H)$

Let M denote the event that a transaction falls through due to difficulty securing a mortgage.

Assume that transactions that fall through for mortgage reasons are *r* times more likely if the lease has high ground rent, i.e.:

[26] BEIS, Research on buying and selling homes, 2017, Pg 72

(i) $P(M|H) = r \cdot P(M|H')$

We would like to derive the probability that a lease has high ground rent, given the transaction has fallen through due to mortgage reasons, i.e.:

(ii) $P(H|M)$

Using Bayes' Theorem, ii can be re-written as:

$$= \frac{P(M|H)P(H)}{P(M)}$$

$$= \frac{P(M|H) \cdot p}{P(M)}$$

Applying formula (i):

$$= \frac{r \cdot P(M|H') \cdot p}{P(M)}$$

(iii) $P(H|M) = \frac{r \cdot P(M|H') \cdot p}{P(M)}$

P(M) can be rewritten using the Law of Total Probability:

$$P(M) = P(M|H)P(H) + P(M|H')P(H')$$

$$= P(M|H) \cdot p + P(M|H') \cdot (1 - p)$$

Substituting out P(M|H) using formula i:

(iv) $P(M) = r \cdot P(M|H') \cdot p + P(M|H') \cdot (1 - p)$

Finally, substitute formula iv into formula iii:

$$P(H|M) = \frac{r \cdot P(M|H') \cdot p}{P(M)}$$

$$= \frac{r \cdot P(M|H') \cdot p}{r \cdot P(M|H') \cdot p + P(M|H') \cdot (1 - p)}$$

$P(M|H')$ cancels out, giving:

$$= \frac{rp}{rp + (1 - p)}$$