



Reviewing the evidence on population growth resulting from provision of new homes in Middlesbrough

November 2022

Note that this report was updated and reissued in March 2023

The analysis and recommendations remain the same as originally published, but additional information has been incorporated from guidance and relevant case law

SUMMARY OF KEY POINTS

Natural England has taken an assumption that each new home will result in an extra 2.4 persons resident in the local area

Middlesbrough Council commissioned ORS to consider the weight to be placed on that assumption and prepare an evidence-based review of the relationship between population growth and provision of new homes

The review first considered the relationship nationally, and then considered relevant details about the local circumstances in Middlesbrough

Based on the evidence, ORS concluded that the annual change in dwelling stock has very limited influence on annual population nationally – building either more or less homes across England is unlikely to result in higher or lower population growth

There is a clear correlation between the change in population and dwelling stock by local area: larger increases in stock tended to result in larger increases in population, lower increases in stock resulted in lower population increases

Four fifths of all local areas had an average that was lower than the Natural England assumption of 2.4 persons

The resident population living in Middlesbrough increased by 5,400 persons over the intercensal period 2011 to 2021 and the stock increased by 4,400 dwellings, equivalent to an average gain of 1.25 persons per dwelling across the whole area

Further analysis of the population data demonstrated that a baseline of new housing provision was needed to accommodate changes to the local population, with further provision enabling migrant population to move to the area

As a consequence, the relationship between population growth and the provision of new homes is non-linear, and when considering the evidence for Middlesbrough the average number of persons per dwelling is sensitive to the overall rate of delivery

The provision of 4,400 dwellings resulted in a gain of 1,000 extra residents living in dwellings in Middlesbrough: an average of 0.23 persons per dwelling – however, this figure depends on the overall number of new homes that are provided

*On balance, the highest 5-year average of dwelling delivery over 30 years provides a reasonable upper-end estimate, with yields an average of **0.6 persons per dwelling***

This provides an appropriate evidence-based local figure for Middlesbrough

Setting the Context

1. Middlesbrough Council has commissioned Opinion Research Services (ORS) to undertake an evidence-based review of the relationship between population growth and the provision of new homes. More specifically, the Council want to understand the weight that can be placed on the assumption taken by Natural England that each new home will result in an extra 2.4 persons resident in the area.
2. Given that context, the review first establishes the relationship nationally, and then considers the local circumstances.

Assessing Nutrient Neutrality

3. Natural England has issued advice to help ensure that new developments do not harm internationally protected Habitats Sites. This advice comes with tools and guidance to help demonstrate “Nutrient Neutrality”.¹
4. The Nutrient Neutrality advice requires LPAs in affected areas to assess the additional burden of nutrients arising as a consequence of new development. This relates to all types of development that result in a net increase in population served by a wastewater system, including new homes and other accommodation.
5. As part of their advice, Natural England published a “*Nutrient Neutrality Generic Methodology*” which provides guidance to LPAs that are required to prepare assessments (page 6):

This practical methodology sets out an approach to calculating how nutrient neutrality can be achieved. This methodology is based on best available scientific knowledge and will be subject to revision as further evidence becomes available. It is our advice to local planning authorities to take a precautionary approach in line with existing legislation and case law when addressing uncertainty and calculating nutrient budgets.

6. The methodology includes a “Nutrient Budget Calculator” and it is recommended that this is used to generate nutrient budgets for each development (page 8):

The nutrient neutrality calculation includes key inputs and assumptions that are based on the best available scientific evidence and research. It has been developed as a pragmatic tool. However, for each input there is a degree of uncertainty. For example, there is uncertainty associated with predicting occupancy levels and water use for each household in perpetuity.

7. The nutrient budget calculation is set out in four stages, and step 1 of the first stage calculates the increase in population due to the development. The aim is to identify the total additional population (number of people) that will result from the development, based on the following calculation (page 10):

No. of new dwellings/units x residents per dwelling value (number of people)

¹ <http://publications.naturalengland.org.uk/file/4929269741649920>

8. Further details on this step of the calculation are set out on pages 13-17 of the guidance, which identifies that that (page 13):

The increase in population is calculated using a residents per dwelling/unit value that is multiplied by the number of dwellings within the development

The residents per dwelling value can be derived from national data providing it reflects local conditions

When using national occupancy data, the Office of National Statistics (ONS) national average value for the number of residents per dwelling of 2.4 is recommended

If national data does not yield a residents per dwelling/unit value that reflects local occupancy levels then locally relevant data should be used instead

Appropriate Assessments [should] specifically include justification for why the competent authority has decided upon the occupancy rate that has been used.

9. The guidance provides further specific advice with regard to locally relevant occupancy data (page 14):

If a Local Planning Authority decides to use a locally relevant value, that value needs to be supported by robust and sufficient evidence

A local / regional average occupancy rate can be used provided that it is from a robust source which can show trends over a protracted period of time

Figures derived from data collected over short periods of time will not be acceptable as short-term data is unlikely to provide the required degree of certainty

A local / regional average occupancy rate would therefore need to be based on figures over at least a 5-year period

The figure of 5 years has been chosen as the minimum period of time over which occupancy rates can be calculated from as local plans and WRMPs are reviewed every 5 years, so represents a long enough period of time to capture any trends or changes.

10. However, there is an apparent disconnect between the “residents per dwelling/unit value” and the overarching objective. The detailed calculation that is proposed provides a robust basis for determining the **overall** population that is likely to be resident in the new development, whereas the guidance sets out at the outset that “this input determines the **additional** population that will result from a new residential development” (page 13, emphasis added).
11. Whilst the overall population could, in some circumstances, be the same as the additional population, this would depend on all of the new residents having migrated to the area. If any residents were already living in the area, then they would not form **additional** population despite being counted in the **overall** population.

12. This difference has been considered by the High Court,² and subsequently the Court of Appeal.³ Both Judgments are detailed and address a number of different issues. However, the appeal was dismissed, and the original Judgment can still be relied upon.
13. The appeal Judgement summarises the judge's conclusions on the "appropriate assessment" grounds (emphasis added):

37. Jay J. was **critical of the approach to occupancy rates in Natural England's technical guidance note**, and of the council's use of an occupancy rate of 2.4 persons per dwelling in this case. But adopting the degree of deference he thought right in the circumstances, and approaching the matter on a Wednesbury basis, he concluded that the use of the 2.4 occupancy rate was sufficiently precautionary. He concentrated, in particular, on two "precautionary elements" of the appropriate assessment that could "legitimately be brought into account": first, that "the relationship [between occupancy rates and water usage] is not one of direct proportionality", and second, that **"the algorithm assumes 100% migration to the area"** (paragraph 84 of his judgment). He was "satisfied that there was an adequate precautionary leeway afforded by [these] two key factors" (paragraph 86). He added, however, that the technical guidance note would need to be reviewed in the light of his judgment (paragraph 87).

14. This conclusion had been based on the following point as summarised in the original Judgement (emphasis added):

68. Seventhly, the 2.4 figure is additionally protective because **it assumes that all occupants of each new dwelling are moving into the affected catchments, which does not reflect the real world.**

15. In the context of this specific case, the consequence of these conclusions was that the assumed occupancy rate of 2.4 persons was likely to be higher than the total additional population (number of people) that would result from the development, and it was therefore not necessary to assume an even higher figure (as was being argued).
16. Although Mr Justice Jay accepted the use of the 2.4 person assumption on the basis that it was sufficiently precautionary (and dismissed the need for a higher figure) the fact that he rightly acknowledged that "the algorithm assumes 100% migration to the area" (and that this evidently does not reflect the real world) is clearly an important consideration when establishing locally relevant data that is robust and provides the required degree of certainty.
17. Given this context, it is appropriate to note that the appeal Judgement confirmed that in relation to the 2.4 person assumption (emphasis added):

125. I would make two observations on what is said in these paragraphs. First, Natural England's recommendation is that **this occupancy rate should be "considered"** by competent authorities, **not that its use is in any way mandatory.** It is described as no

² [Wyatt v Fareham and Natural England \[2021\] EWHC 1434 \(Admin\)](#)

³ [Wyatt v Fareham Borough Council \[2022\] EWCA Civ 983](#)

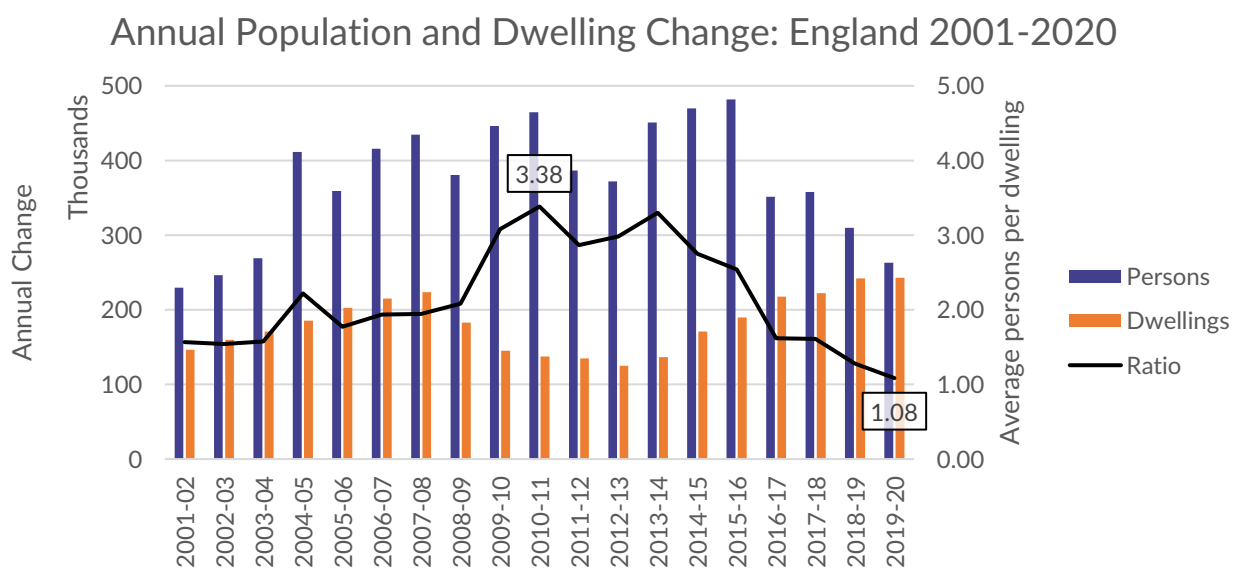
more than **“a starting point”**. Second, the Advice states that competent authorities “may” choose to adopt a different rate, tailored to a particular area or particular scheme, but that where they do so, **the occupancy rate adopted must be evidence-based, clearly explained and consistent with other calculations used** in relation to the proposed development.

18. On this basis, the following review considers the national occupancy rate in the context of local circumstances. It then establishes the most appropriate local value to use at step 1 of the first stage of the calculation, supported by robust and sufficient evidence, in order to determine “the **additional** population that will result from a new residential development” in this area.

New Homes and Population Growth in England

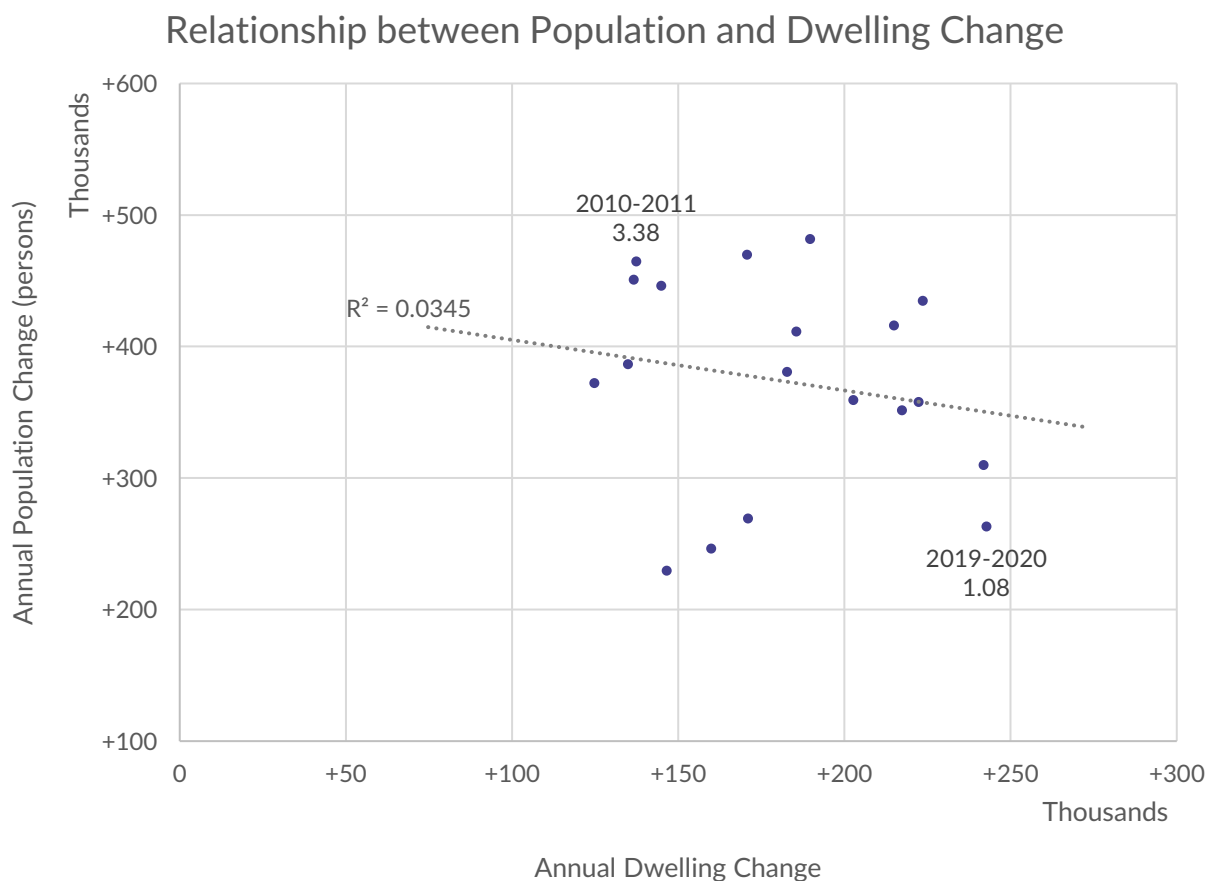
19. Data from the Census shows that the population for England increased from 53.0 million to 56.5 million persons over the 10-year period 2011-2021, with a growth of 3.48 million persons over the period. Over the same period, Government data confirms that the dwelling stock increased from 23.0 million to 24.9 million homes, with an additional 1.90 million dwellings provided over the period. Given this context, we can conclude that there was an average of 1.83 persons for each additional dwelling provided at a national level across England.
20. The rate of population growth over the decade 2011-2021 was lower than the previous intercensal period 2001-2011 (3.48 cf. 3.87 million) whilst the number of new homes provided was higher (1.90 cf. 1.77 million). As a consequence, there was an average of 2.19 persons for each additional dwelling provided nationally over the period 2001-2011.
21. Whilst the Census is considered to provide the most robust estimate of population growth, the Office for National Statistics (ONS) publish estimates of population growth each year. The following charts show the annual changes each year over the period 2001 to 2020.

Fig 1 Annual Population and Dwelling Change for England 2001 to 2020 (Source: Mid-year Population Estimates, ONS; Net additional dwellings by local authority district, Live Table 122)



22. The data shows that there was a notable increase in population growth from 2004-2005 which was the year in which the A10 accession countries joined the European Union. This higher rate of growth was broadly sustained until 2015-2016, but there have been lower rates of growth since the Brexit referendum in 2016 and more recently as a result of the Covid pandemic.
23. Dwelling delivery increased over the decade from 2001, but progressively reduced following the financial crisis in 2008. Since the introduction of the National Planning Policy Framework in 2012, the number of new homes delivered annually has increased year-on-year.
24. Considering the data on an annual basis, the number of persons for each additional dwelling peaked at an average of 3.38 persons in 2010-2011, but the latest data shows a notably lower average of 1.08 persons for 2019-2020. On the basis of data, we can therefore conclude that the relationship between housing delivery and population growth varies over time, even at a national level.
25. The following chart plots the relationship between annual population and dwelling change. The R^2 value identifies the strength of correlation between the figures. An R^2 value of 1.0 means that they are perfectly correlated, whereas an R^2 value of 0.0 means that there is no correlation. The relationship between annual population and dwelling change for England for the 19 years 2001-2002 to 2019-2020 has an R^2 value of 0.03 which means that there is extremely limited correlation between the figures.

Fig 2 Relationship between Annual Population and Dwelling Change for England 2001 to 2020 (Source: Mid-year Population Estimates, ONS; Net additional dwellings by local authority district, Live Table 122)

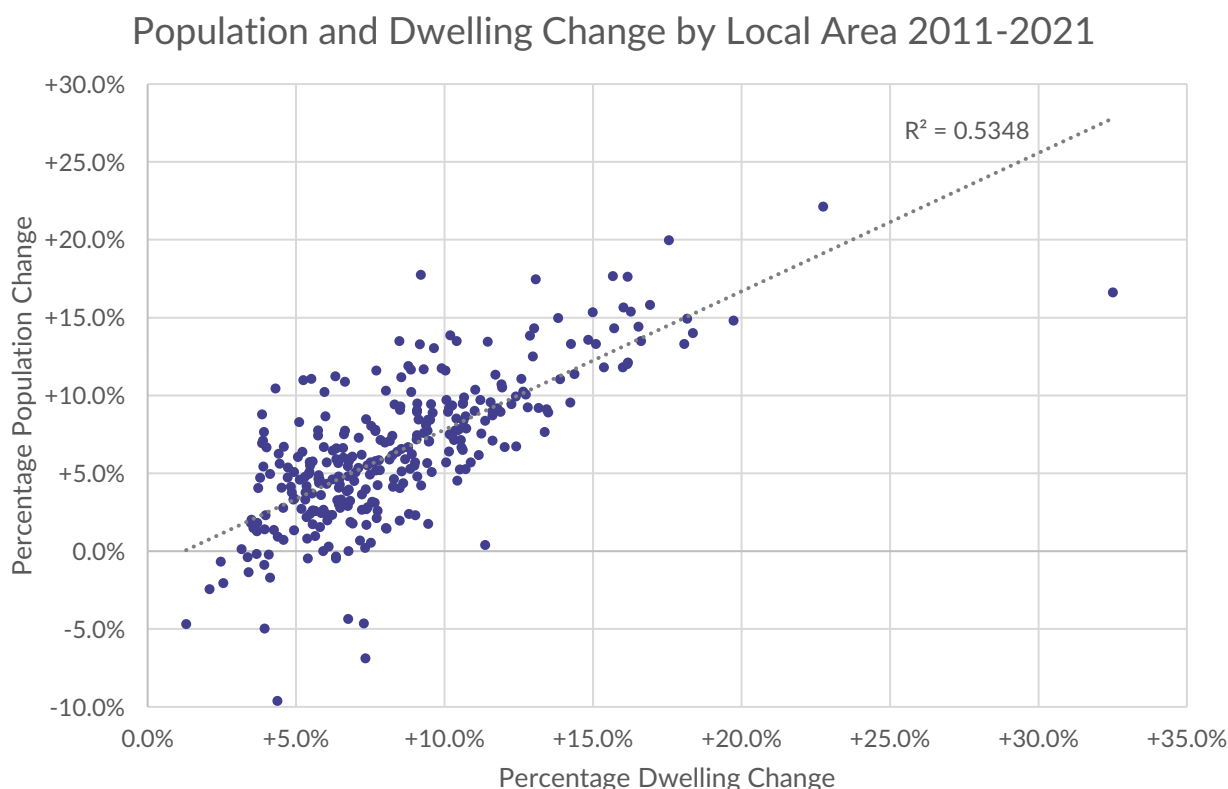


26. Given this context, we can conclude that the annual change in dwelling stock has very limited influence on annual change in population at a national level – in other words, building more new homes is unlikely to result in higher population growth nationally across England, and building fewer new homes is unlikely to result in lower population growth nationally.
27. However, the evidence demonstrates that the average number of persons for each additional dwelling provided nationally has ranged from a minimum of 1.08 persons to a maximum of 3.38 persons each year over the period 2001-2020, with a median (mid-point) of 1.94 persons. Therefore, even if it was possible to assume that population growth was dependent on the number of new homes provided, the evidence does not support the Natural England assumption that each new home will result in an extra 2.4 persons resident.
28. Census data identifies an average of 1.83 additional persons for each additional dwelling provided over the last decade at a national level across England, whereas the median annual figure identifies an average of 1.94 persons for each additional dwelling. The Natural England assumption of 2.4 persons on average is between 24% and 31% higher than the data for England.

New Homes and Population Growth by Local Area

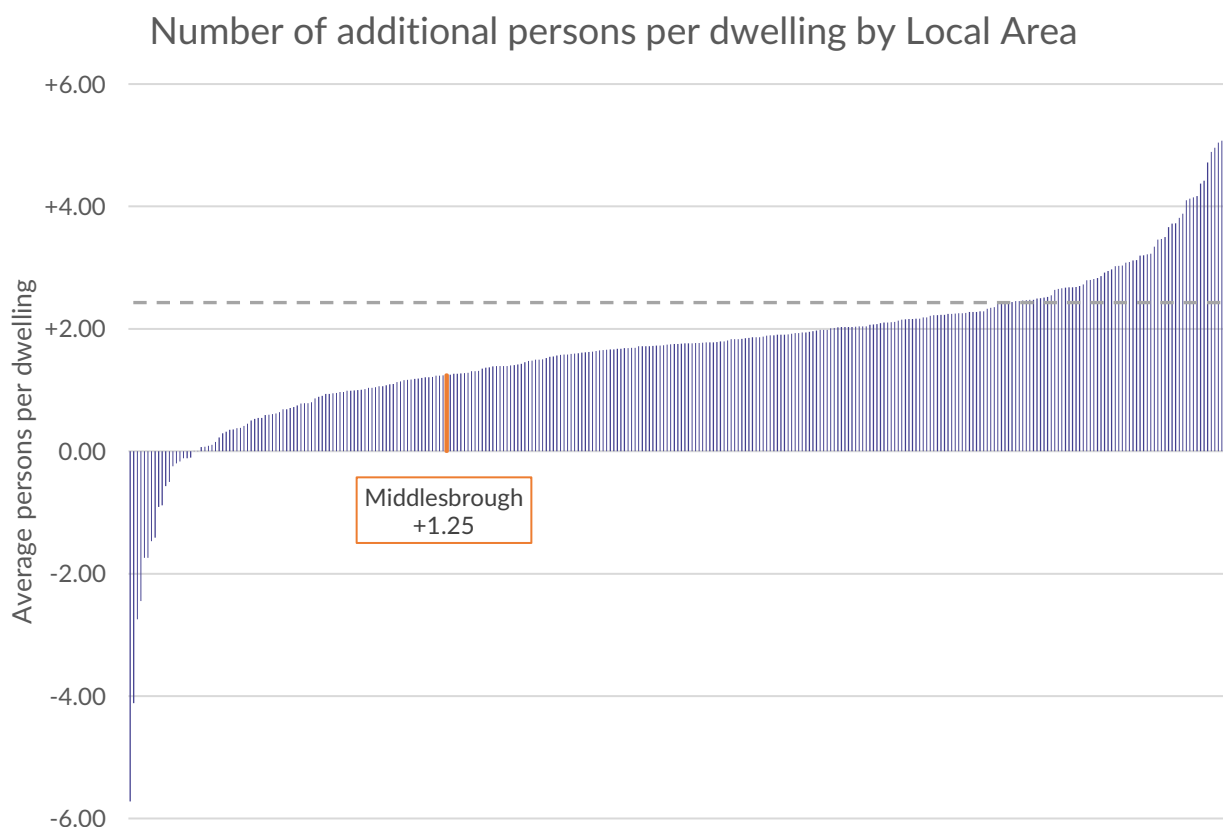
29. Whilst the number of new homes has a very limited influence on the population growth from year-to-year at a national level, it may still influence the geographic distribution of where the population are usually resident. It is therefore appropriate to consider the data for local areas.

Fig 3 Relationship between percentage Population and Dwelling Change for Local Areas in England 2011-21
(Source: Total population, Census; Net additional dwellings by local authority district, Live Table 122)



30. The relationship between the percentage population change and the percentage dwelling stock change for each local authority area over the 10-year period 2011 to 2021 has an R^2 value of 0.53 which means that there is correlation between these two figures. Local areas that had a larger proportionate increase in dwellings stock tended also had a larger proportionate increase in resident population, whilst those with a smaller proportionate increase in dwellings had a smaller proportionate increase in resident population.
31. When considering the number of additional persons for each additional dwelling provided over the last decade for each local authority area, the average ranges from a gain of 5.80 persons per additional dwelling to a loss of 5.72 persons per dwelling – albeit that relatively few areas (18 out of 309) recorded a loss of population, and none recorded a loss of dwelling stock. The figure for the median area shows an average gain of 1.74 persons for each additional dwelling. Just over a fifth of all local areas (65 out of 309) had an average gain of 2.4 persons or more (i.e. the gain assumed by Natural England for all additional dwellings) whereas almost four fifths of all local areas (244 out of 309) had an average gain below this number of persons.

Fig 4 Relationship between Annual Population and Dwelling Change for England 2001 to 2020 (Source: Mid-year Population Estimates, ONS; Net additional dwellings by local authority district, Live Table 122)



32. Data from the Census shows that the population for Middlesbrough increased from 138.4 thousand to 143.9 thousand persons over the 10-year period 2011-2021, an increase of 5,400 persons over the decade. Over the same period, the dwelling stock increased from 60.0 thousand to 64.4 thousand homes, with an additional 4,400 dwellings provided. We can therefore conclude that there was an average of 1.25 persons for each additional dwelling provided over the decade in the Middlesbrough local authority area.

Components of Population Change

33. Reviewing the more detailed ONS population estimates for Middlesbrough over the 10-year period 2011-2021 the data shows that there was a total of 19,100 births and 14,700 deaths recorded in the area. This suggests that natural population change (i.e. births minus deaths) led to an increase of 4,400 persons over the period.
34. As overall population growth totalled 5,400 persons and natural population change led to 4,400 additional residents, we can conclude that there was a net gain of around 1,000 persons moving from elsewhere to dwellings in the area.
35. We can therefore conclude that over the decade 2011-2021, the **provision of 4,400 dwellings** resulted in a total gain of **1,000 additional residents** in Middlesbrough: which represents an average gain of **0.230 persons per dwelling**.
36. Evidently, this is well below the Natural England assumption that each new home will result in an extra 2.4 persons resident in the area. Nevertheless, it is important to recognise that this is not the number of residents occupying new homes. Instead, it is the number of extra persons that will live in the area as a result of new homes being provided.

Changes to the Local Population

37. Many of the people occupying new homes would have already been residents living within the local area. In choosing to move to a new home, they would not have added to the number of people living in the area. The provision of new dwellings simply allowed the same residents to live in a different home. Had these new homes not been provided, it is unlikely that this would have had any material impact on the natural population change – there would still have been broadly the same number of births and deaths recorded over the decade, and therefore the same number of residents. However, those residents would have lived in larger households.
38. Without any new dwelling provision, the increase in the resident population resulting from natural growth would have led to the average number of persons per dwelling increasing from 2.309 persons (based on the 2011 Census) to an average of 2.381 persons by 2021 – but the provision of new homes led to the average reducing to 2.236 persons over the 10-year period.
39. This reduction in the average is consistent with long-term national and local trends, largely due to population ageing. Many older persons tend to live as couples or single person households, and this increase in one- and two-person households results in a fall to the average size overall. The death of elderly household members over the decade would have led to many existing households getting smaller, but additional homes were still needed for new households to form. Without those additional homes, the number of concealed households would have increased resulting in more larger households, including some that would have been overcrowded.
40. To accommodate the natural change in population and allow the ratio of persons to dwellings to reduce required around 3,950 homes to be provided without any extra residents living in the area. This is almost 90% of all new homes delivered over the decade.

Residents of New Homes

41. Information about the initial occupiers of new homes on a number of development sites confirms that most households were already living in the local area.
42. Data provided to the Council by individual developers and agents about the previous postcodes of residents on three separate sites identified that more than 90% of dwellings were occupied by people moving within the Tees catchment area.

Fig 5 Previous addresses of movers to recent new developments (Source: Information provided by individual developers and agents)

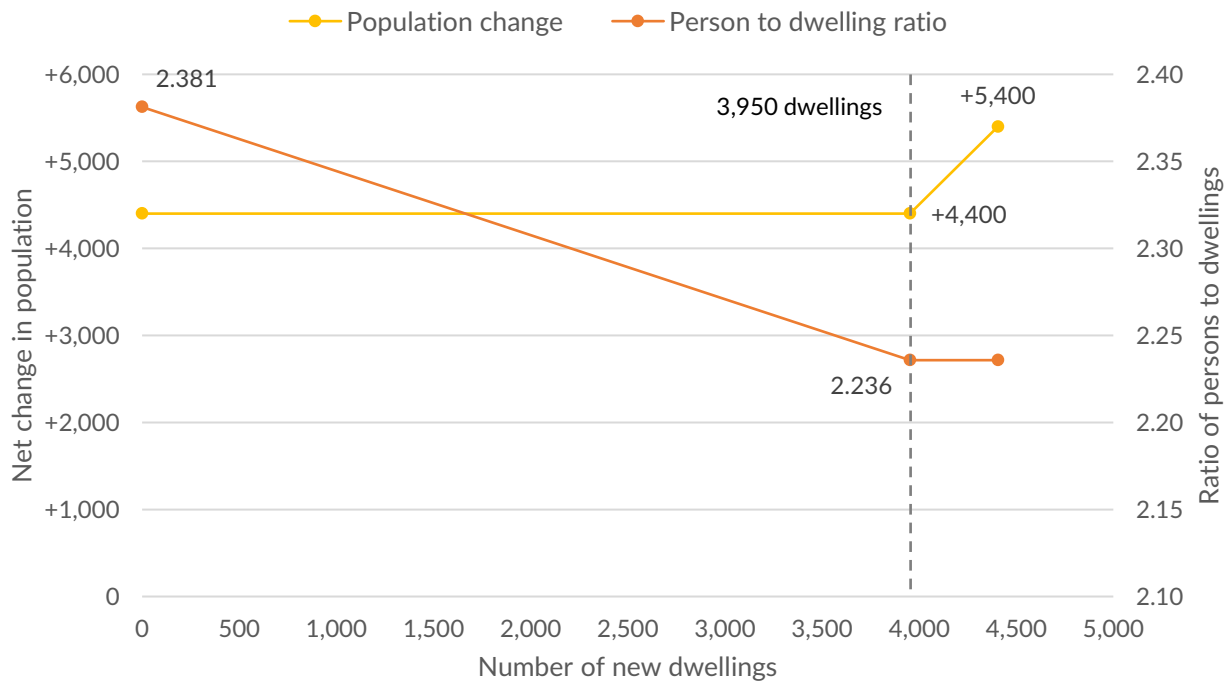
		Development A	Development B	Development C
Total dwellings on site		160	77	-
Number where previous postcode known		141	40	245
Postcodes within Tees catchment	Number	130	37	223
	Percentage	92%	93%	91%

43. On this basis, it is evident that only around one-in-twelve of the homes across each of these three sites were occupied by residents new to the area.
44. Of course, any households that were already established would have vacated their previous home at the time that they moved to the new home. Some of those existing properties could subsequently have been occupied by residents moving to the area from elsewhere – but data from the Survey of English Housing confirms that households migrating between areas typically represent a higher proportion of moves to new homes than moves to existing properties.
45. Therefore, when considering moves to the existing stock, fewer than one-in-twelve households are likely to have moved from outside the area.
46. Based on both the evidence from the demographic analysis and the information from developers, we can therefore conclude that the substantial majority of moves are likely to be local households moving within the area – so many new homes will not result in any extra residents living in the area.

Impact of New Homes on the Population

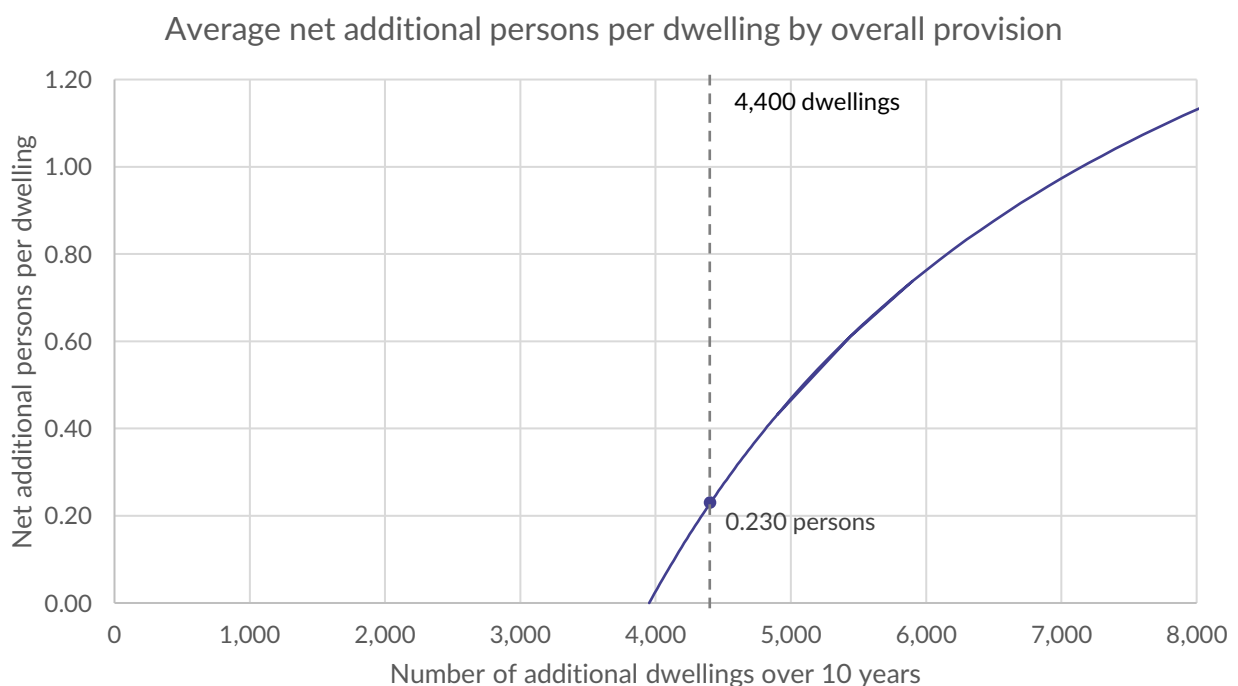
47. The relationship between the provision of new homes and the number of extra residents in the area will fundamentally depend on population change resulting from net migration; but there is a non-linear relationship between population growth and the provision of new homes.
48. We have previously identified that 4,400 dwellings were provided over the decade 2011-2021, and of these around 3,950 were needed to accommodate the local population, thereby reducing the ratio of persons to dwellings. It is reasonable to conclude that the remaining 450 dwellings would have enabled migrant population to move to the area, thereby increasing the net change in population and resulting in extra persons resident in the area (Fig 6).

Fig 6 Relationship between population change and ratio of average persons to dwellings, to dwelling provision for Middlesbrough based on trends from 2011 to 2021



49. The consequence of the non-linearity of the relationship is that the number of additional persons per dwelling will vary dependent on the total number of dwellings that are provided. This relationship is illustrated in the following chart, which demonstrates that the higher the number of dwellings provided, the higher the gain in terms of the average number of additional persons per dwelling (Fig 7).

Fig 7 Average net additional persons per dwelling by overall dwelling provision over a 10-year period for Middlesbrough based on trends from 2011 to 2021



Conclusions

50. When considering population gain for the purposes of assessing Nutrient Neutrality, the most appropriate assumption will depend on the individual circumstances of each local area.
51. Natural England has provided a “starting point” which recommends using the national average value for the number of residents per dwelling of 2.4 persons, providing that this reflects local conditions. However, following a High Court challenge, the Judgement from Mr Justice Jay was critical of this approach due to the algorithm assuming 100% migration to the area.
52. Although the detailed calculation proposed by Natural England provides a robust basis for determining the **overall** population that is likely to be resident, it is the **additional** population that has to be assessed when seeking to establish the additional burden of nutrients arising as a consequence of each new development.
53. It is important to consider the intrinsic assumption that all occupants of each new dwelling will be moving into the affected catchment area in the context of the local area. The analysis has identified that over the 10-year period 2011-2021 the dwelling stock in Middlesbrough increased by 4,400 dwellings (paragraph 32).
54. Based on the Natural England assumption that each new dwelling would yield 2.4 persons, the area’s population would have increased by over ten thousand persons over the same period; however, Census data shows that the actual increase was just over five thousand persons and, of these, only one thousand had migrated to the area. The “starting point” assumption is clearly not appropriate in this local area, due to many new homes being occupied by people who were already resident in the area.
55. The analysis has also identified that the ratio of household population to dwellings was around 2.2 persons per dwelling at the time of the 2021 Census (paragraph 38). This figure is broadly equivalent to the national average of 2.4 persons per dwelling at the time of the 2011 Census. However, whilst this is based on local circumstances and reflects the most up-to-date estimate, it makes no allowance for migration.
56. In seeking to identify “the **additional** population that will result from a new residential development” which is the input that is required at step 1 of the first stage of the nutrient budget calculation, the analysis has considered the most robust data that is available, and take account of trends over a protracted period of time – the 10-year intercensal period being double the 5-year minimum as identified by the guidance.
57. Whilst the precise number of additional persons is likely to vary to some extent based on the number of dwellings provided, the primary conclusion is that over the decade 2011 to 2021, the **overall provision of 4,400 dwellings** resulted in a total gain of **1,000 additional residents** in Middlesbrough: an average gain of **0.230 persons per dwelling**. However, assuming that current rates of housing delivery will continue unchanged could underestimate the number of extra persons resident in the area (depending on future rates of housing provision) and it is necessary to take a sufficiently precautionary approach to the value that is assumed.

58. In terms of the variance, we can infer that had the number of net additional dwellings been 10% lower than were actually delivered (an average of around 400 dwellings per annum) then the gain would have averaged 0.007 persons per dwelling (equivalent to a reduction of 97%) whereas had the number of net additions been 10% higher than delivered in practice (an average of around 485 dwellings per annum) then the gain would have averaged 0.412 persons per dwelling (equivalent to an increase of 79%). On this basis, we can conclude that the average number of persons is relatively sensitive to the overall rate of housing delivery.
59. Over the period from 1991-92 to 2021-22, net dwelling additions have ranged from an annual loss of 251 dwellings to an annual gain of 678 dwellings. When considering periods of sustained dwelling delivery, the highest 10-year average over the period was 490 dpa and the highest 5-year average was 544 dpa, which yield gains of 0.43 persons per dwelling and 0.61 persons per dwelling respectively.
60. Evidently, both fall well below the Natural England assumption that each new home will result in an extra 2.4 persons resident in the area, but they also clearly illustrate that assuming a rate of 0.23 persons per dwelling could underestimate the number of extra persons resident in the area depending on future rates of housing provision. Given this context, the extent of any precautionary adjustment needs to be considered in the context of these sensitivity tests.
61. It is therefore necessary to take a judgement about the realistic future rate of delivery when determining the most appropriate assumption to use for the number of extra persons resident in the area following the provision of new homes. On balance, we would consider the highest 5-year average of dwelling delivery based on past trends for over 30 years to provide a reasonable upper-end estimate, with results in an average of 0.6 persons per dwelling.
62. **On this basis, we would recommend that it is assumed that each new home provided in Middlesbrough will result in up to an extra 0.6 persons resident in the area.**
63. Although this rate is considerably lower than the 2.4 persons assumed by Natural England, it is based on detailed analysis of the evidence currently available for the local area. Nevertheless, it will be important to continue monitoring relevant population data to ensure that the assumptions taken remain appropriate.