Monmouthshire

Updating the RLDP Demographic Evidence

November 2021

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Acknowledgements

Demographic statistics used in this report have been derived from data from the Office for National Statistics licensed under the Open Government Licence v.3.0.

Contents

1 Introduction

Context

1.1 Monmouthshire County Council has commenced preparation of its Replacement Local Development Plan (RLDP), covering the plan period 2018–2033. The RLDP is to be informed by the latest demographic statistics and forecasts, updating the previous evidence provided to the Council in 2019.

1.2 In August 2020, the Welsh Government (WG) published its 2018-based population and household projections, a first update since the 2014-based equivalent, and providing the *baseline* for the RLDP demographic evidence. Following the release of the WG's 2018-based projections, Edge Analytics updated the suite of trend, dwelling-led and employment-led scenarios configured in June 2019, incorporating the latest WG evidence and using mid-year population estimates (MYE) up to 2019.

1.3 Since the 2020 analysis was completed, a range of new demographic evidence has become available, including the 2020 MYE, published in June 2021, and housing completions statistics up to 2020/21.

1.4 This report provides an update to the 2020 analysis, considering the new demographic statistics, and providing updated trend, dwelling-led and employment-led scenario evidence for Monmouthshire.

Approach

1.5 Edge Analytics is a specialist in Data Science, with a particular expertise in demographic modelling and forecasting and has worked with local planning authorities across Wales in the development and presentation of evidence to support LDP formulation.

1.6 Edge Analytics has used POPGROUP technology to configure an updated range of growth scenarios for Monmouthshire, incorporating demographic statistics from both the Office for National Statistics (ONS) and WG, to produce forecasts for a 2018–2033 plan period.

1.7 Section 2 updates the Monmouthshire Area Profile with the latest demographic statistics. Section 3 presents the demographic growth scenarios, with the employment-led options detailed in Section 4. A summary of the evidence is provided in Section 5. The Appendices provide supplementary detail on the scenario outputs, alongside the methodology, data and assumptions used in the formulation of the analysis.

1.8 Note that where Monmouthshire Unitary Authority (UA) is referred to, this relates to the full geographical extent of the Authority, including the area *within* the Brecon Beacons National Park (BBNP). Where Monmouthshire Local Planning Authority (LPA) is referred to, this relates to the area *outside* the BBNP only.

2 Area Profile

Geography

2.1 Located in the South East Wales region, Monmouthshire UA borders Powys to the north, and Newport, Torfaen, and Blaenau Gwent to the west (Figure 1). Monmouthshire UA also borders England, with Herefordshire and Forest of Dean to the east, and Bristol and the surrounding authorities available via the Severn crossings. The BBNP intersects the northwest of the UA.

Figure 1: Monmouthshire UA – Geographical Context

Population Change

2.2 As of mid-year 2020, Monmouthshire UA's population was estimated to be approximately 95,000; an increase of 10,180 (12%) since 2001 (Figure 2).

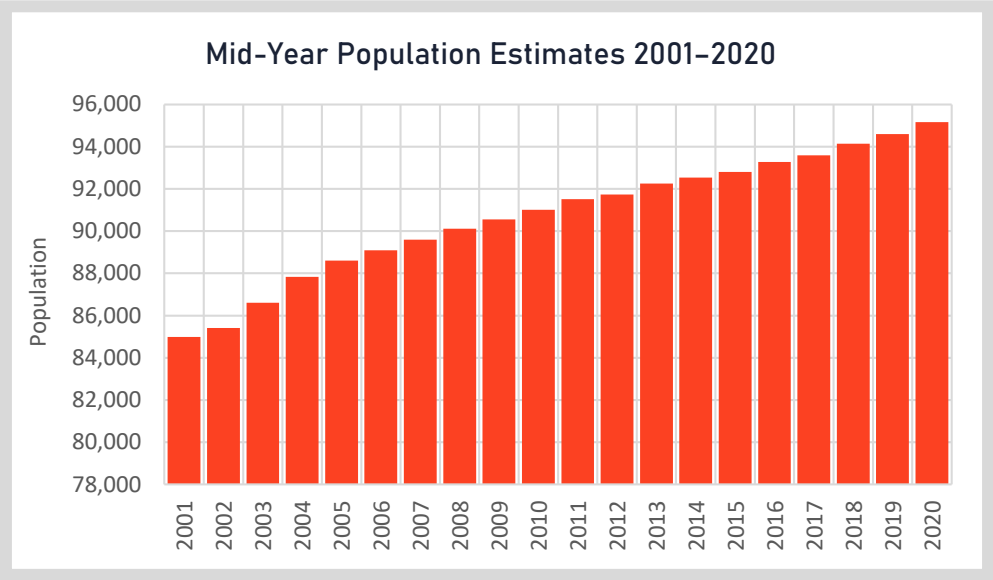


Figure 2: Monmouthshire UA - Mid-Year Population Estimates, 2001-2020 (Source: ONS)

2.3 Across Wales, population growth since 2001 has ranged from -3.3% to 19.1%, with just one unitary authority experiencing population decline (Figure 3). Monmouthshire UA's growth rate has been exceeded by Cardiff (19.1%), Bridgend (14.6%), Newport (13.7%), The Vale of Glamorgan (13.4%) and Pembrokeshire (12.1%). Ceredigion has experienced population decline since 2001, at -3.3%.

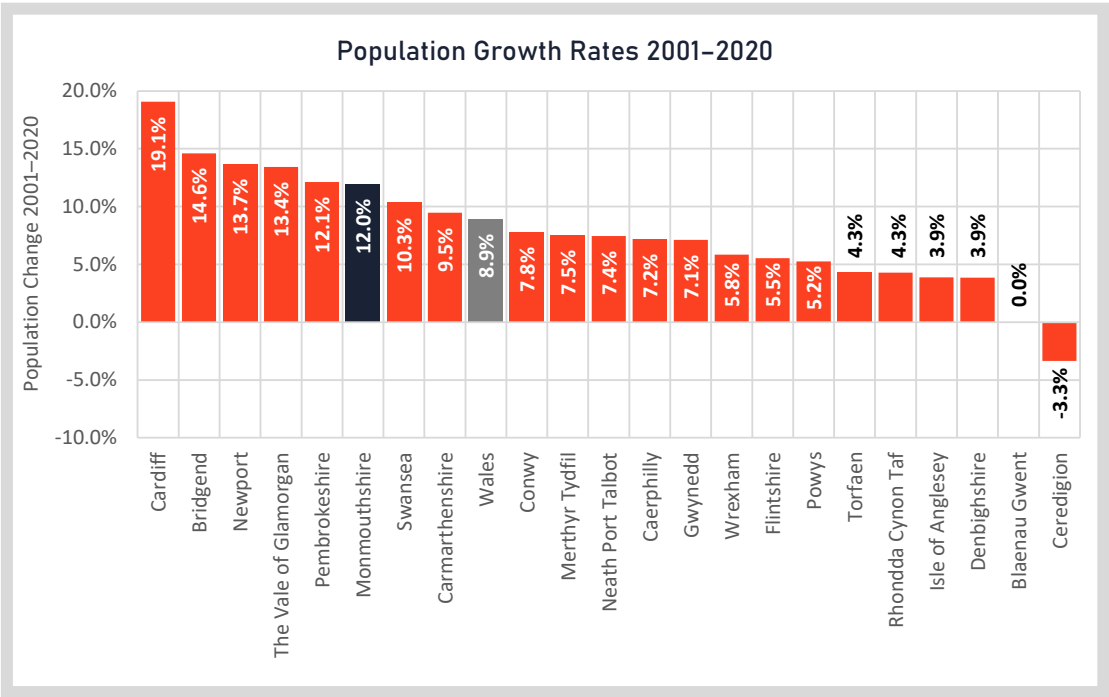


Figure 3: Monmouthshire UA - Population Growth Comparison – Wales, 2001–2020 (Source: ONS)

2.4 Monmouthshire UA's population has increased year-on-year since 2001/02, with the highest annual population growth recorded in 2002/03 and 2003/04 (Figure 4). Since 2005/06, annual population growth in Monmouthshire UA has fluctuated around +400 per year, consistently exceeding +400 per year since 2017/18.

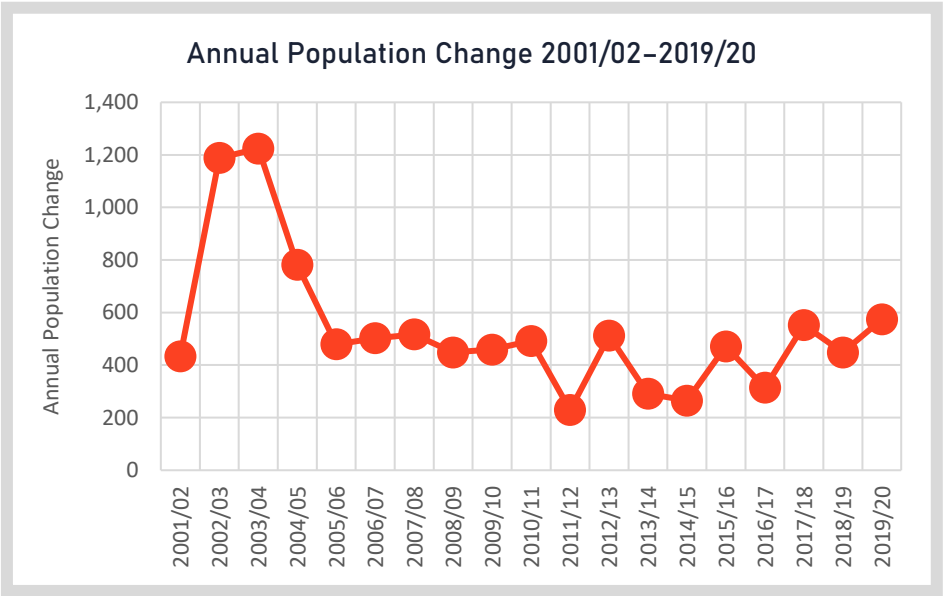


Figure 4: Monmouthshire UA - Population Change, 2001/02–2019/20 (Source: ONS)

2.5 Since 2010/11, Monmouthshire LPA's annual housing completions have averaged +297 dwellings per annum (dpa)[1], with an uplift in housing completion rates recorded in the last three years (Figure 5).

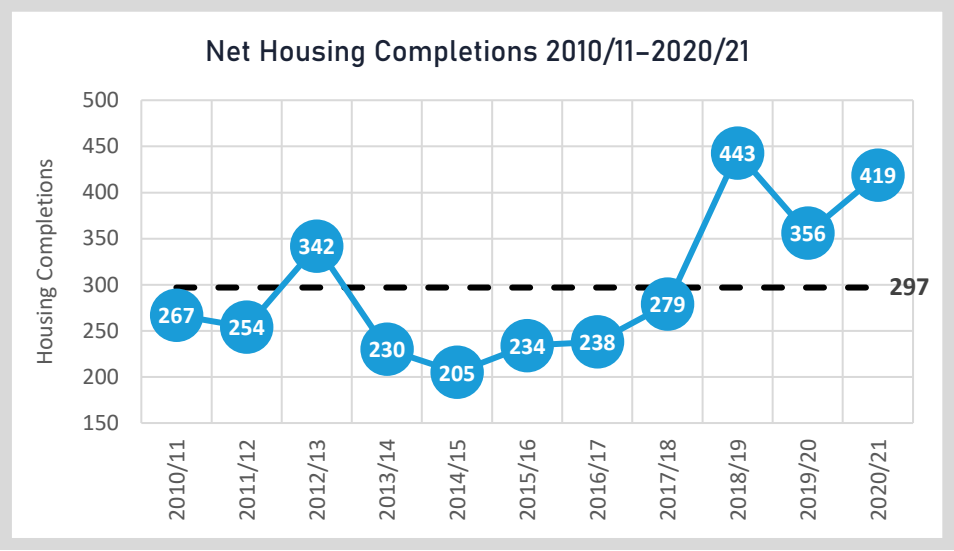


Figure 5: Monmouthshire LPA - Housing Completions, 2010/11–2020/21
(Source: Monmouthshire Joint Housing Land Availability Report, 2019 & Monmouthshire County Council)

[1] Note that the housing completion statistics, published by Monmouthshire County Council, relate to Monmouthshire LPA (i.e. the area *outside* the BBNP only).

2.6 An index of population growth for each of four broad age-groups (0–15, 16–64, 65+, 80+) reveals the important demographic changes that are taking place within Monmouthshire UA, illustrating the ageing of the population over time (Figure 6).

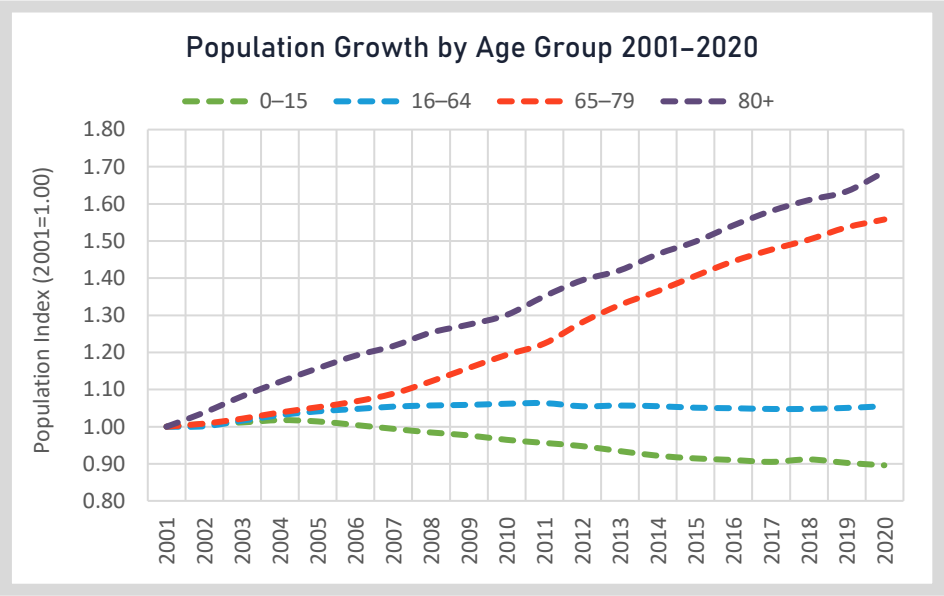


Figure 6: Monmouthshire UA - Population Age Profile Index, 2001-2020 (Source: ONS)

2.7 Since 2001, the 65–79 and 80+ age-groups have increased in size by 56% and 69% respectively. In contrast, the 0–15 age-group is 10% smaller than its 2001 total. The size of the 16–64 age-group, the student and labour force age-group, has remained relatively stable since 2006, approximately 5–6% higher than in 2001.

Births, Deaths & Migration

2.8 The 'components' of population change for Monmouthshire UA illustrate the factors that are estimated to have driven population change since 2001, including an upward adjustment (Unattributable Population Change) to its population following the 2011 Census (Figure 7).

2.9 Natural change (the difference between births and deaths) has generally had a negative impact upon population change, with a net loss since 2004/05. A net inflow from internal migration has been the main contributor to Monmouthshire UA's population growth since 2001/02, with the net inflow in 2019/20 the highest recorded since 2003/04. Net international migration impacts have been smaller but with a net inflow estimated in all years since 2011/12.

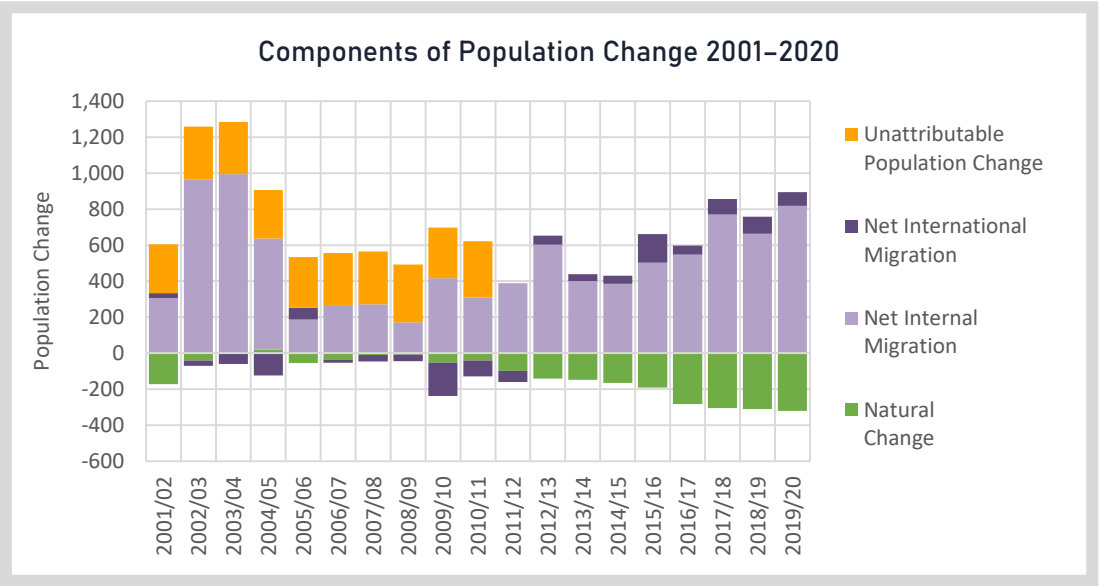


Figure 7: Monmouthshire UA - Components of Population Change, 2001/02-2019/20 (Source: ONS)

Natural Change

2.10 A closer examination of birth and death trends reveals that the number of deaths has exceeded births in all years except 2004/05 (Figure 8). A peak in birth numbers in 2003/04 to 2008/09 has been followed by a decline, with the lowest number of births over the 2001–2020 period recorded in 2018/19. With correspondingly higher death totals, the population decline resulting from natural change has increased since 2015/16.

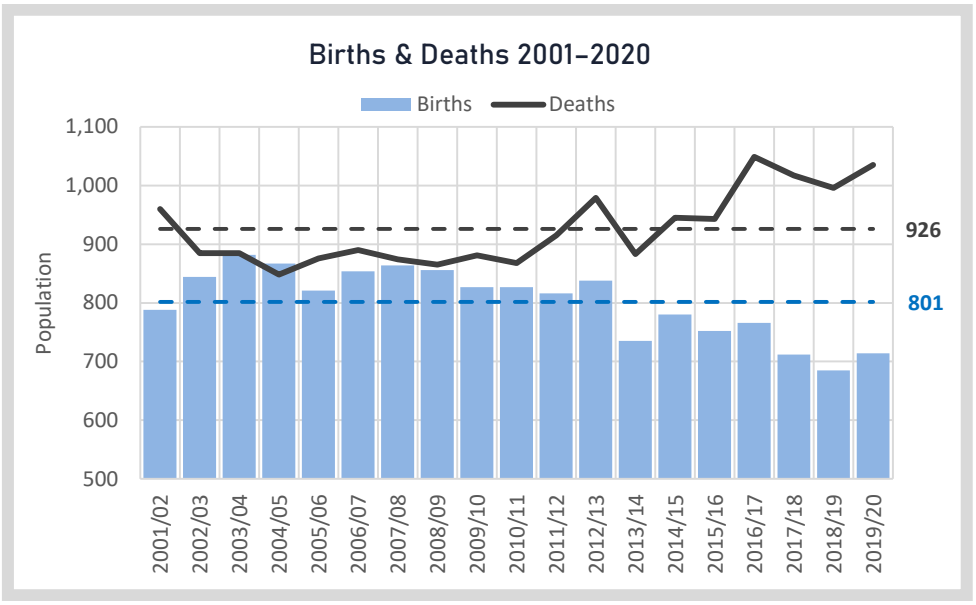


Figure 8: Monmouthshire UA - Births & Deaths, 2001/02-2019/20 (Source: ONS)

Internal Migration

2.11 A more detailed scrutiny of Monmouthshire UA's internal migration statistics reveals the annual fluctuations in both inflows and outflows. The inflow of internal migrants was at its lowest in 2008/09,

at +3,796, rising steadily thereafter to its peak of +5,097 in 2018/19. Reflective of the COVID-19 pandemic and associated restrictions in the latter half of mid-year 2020, large annual decline in both in- and out-migration was recorded in 2019/20. However, the positive net impact of internal migration was still substantial (Figure 9).

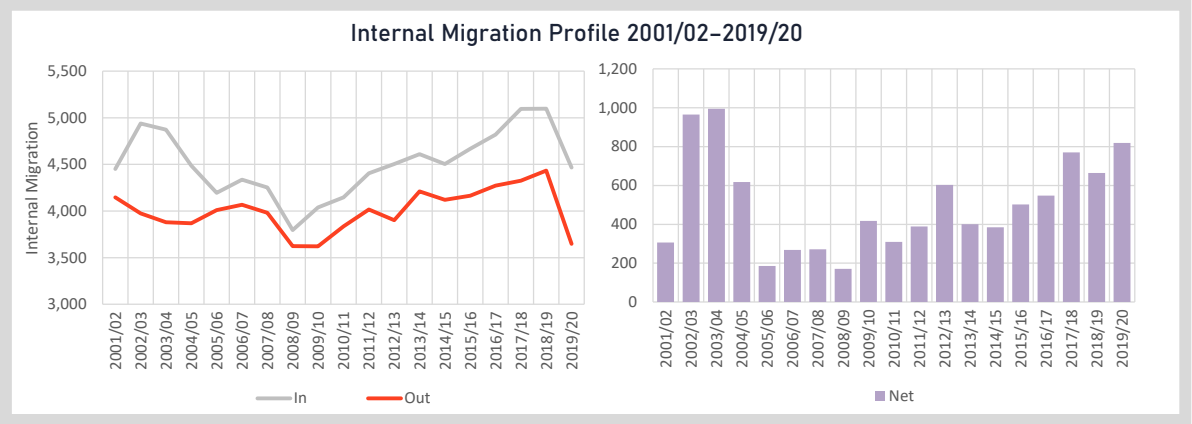


Figure 9: Monmouthshire UA - Internal Migration Profile, 2001/02 – 2019/20 (Source: ONS)

2.12 The Higher Education Leavers Methodology (HELM)[2], designed to better reflect the speed and pattern of movement of students following graduation, may have contributed to the relatively high net migration total experienced 2016/17–2018/19. The importance of the student outflow to higher education is emphasised in Monmouthshire UA's age-profile of internal migration, indicating a large net outflow in the 15–19 student age-group. All other age-groups record a net inflow through internal migration, confirming Monmouthshire UA's attractiveness as a destination for migrants across all family, labour-force and older age-groups (Figure 10).

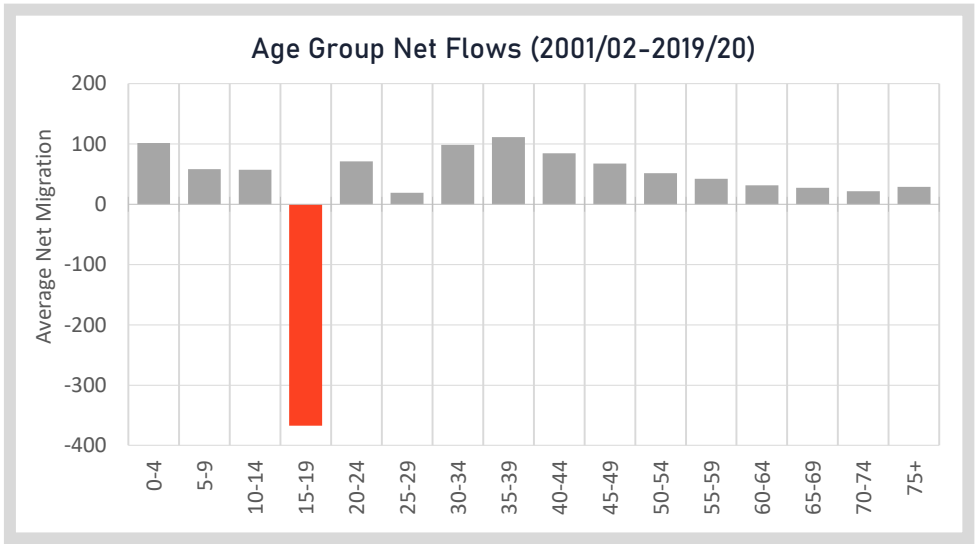


Figure 10: Monmouthshire UA - Internal Migration Age Profile, 2001/02-2019/20 (Source: ONS)

2.13 The recent rise in Monmouthshire UA's net migration inflow may be influenced to some degree by the 'return' of students aged 20–24, but in the last two years the net inflow increase has been experienced

[2] ONS 2020 Population estimates for the UK, mid-2019: methods guide

across the majority of age-groups, with the exception of 15–19 year-olds (Figure 11). This suggests an in-migration of young people and families to Monmouthshire UA, in line with the increased level of housing provision.

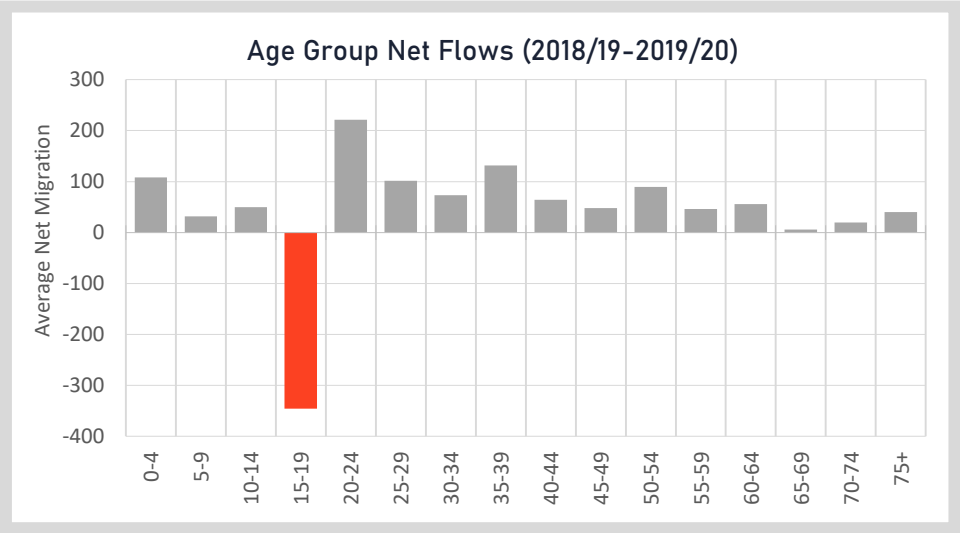


Figure 11: Monmouthshire UA - Internal Migration Age Profile, 2018/19–2019/20 (Source: ONS)

2.14 Geographically, Monmouthshire UA's most significant net migration inflow exchange (2001–2020) has been from South Gloucestershire and Bristol with an average net inflow of +92 per annum (pa) and +65 pa respectively. In contrast, its net migration outflow exchange has been greatest with Swansea and Carmarthenshire (Figure 12).

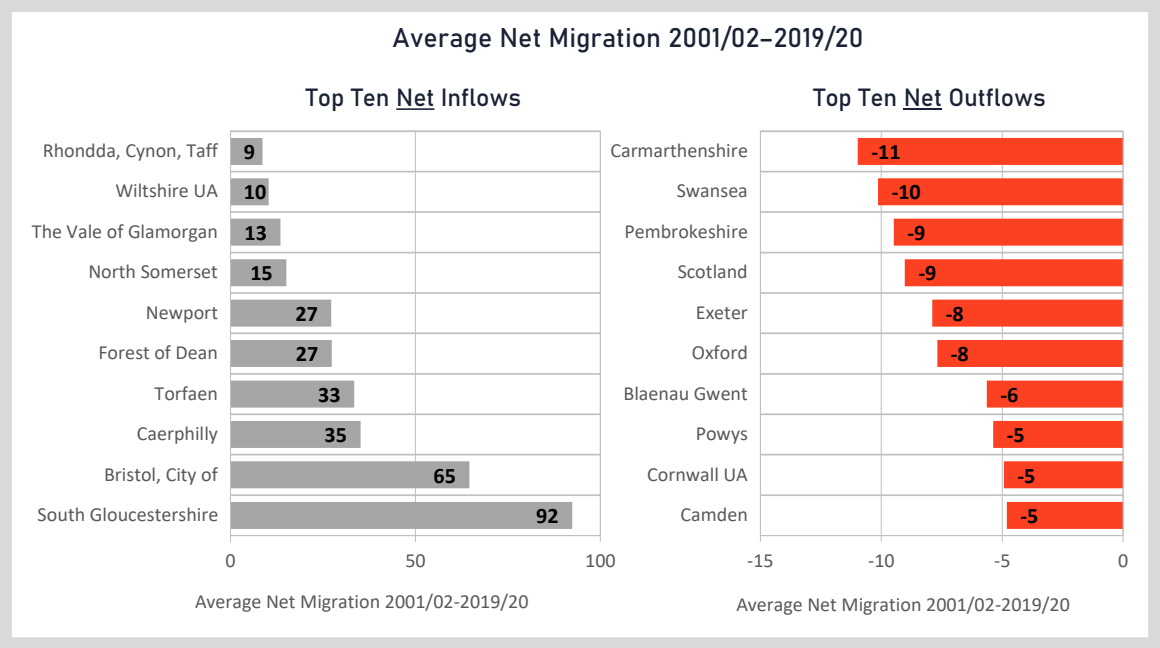


Figure 12: Monmouthshire UA - Top Ten Net Migration Inflows and Outflows, 2001/02–2019/20 (Source: ONS)

2.15 In the last two years of migration evidence, in-migration from South Gloucestershire and Bristol has risen, with additional flows from the Forest of Dean and Caerphilly (Figure 13).

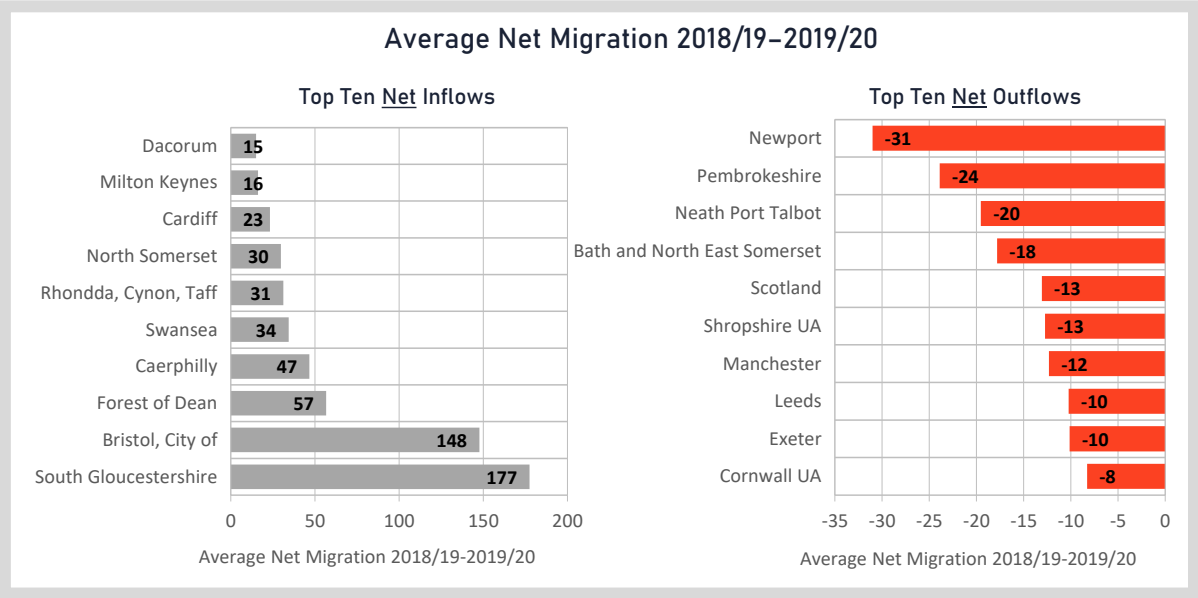


Figure 13: Monmouthshire UA - Top Ten Net Migration Inflows and Outflows, 2018/19–2019/20 (Source: ONS)

International Migration

2.16 International migration continues to be the most difficult component to estimate robustly; with ONS downgrading its output to 'experimental statistics' status, whilst improvements continue[3]. The International Passenger Survey (IPS) provides the foundation of the UK's immigration and emigration estimates but this is being discontinued, in favour of a mix of administrative datasets, including the patient register, higher education statistics and national insurance number (NINo) registrations.

2.17 International migration has had a more limited impact on Monmouthshire UA's population change but its contribution has been positive in the majority of years since 2011, peaking at +160 in 2015/16 (Figure 7). NINo statistics provide a complementary illustration of international migration inflow to Monmouthshire UA; different to ONS MYE statistics in that they refer only to work-based in-migration and include migrants whose stay may be shorter than 12 months (Figure 14).

[3] ONS 2019 Statement from the ONS on the reclassification of international migration statistics

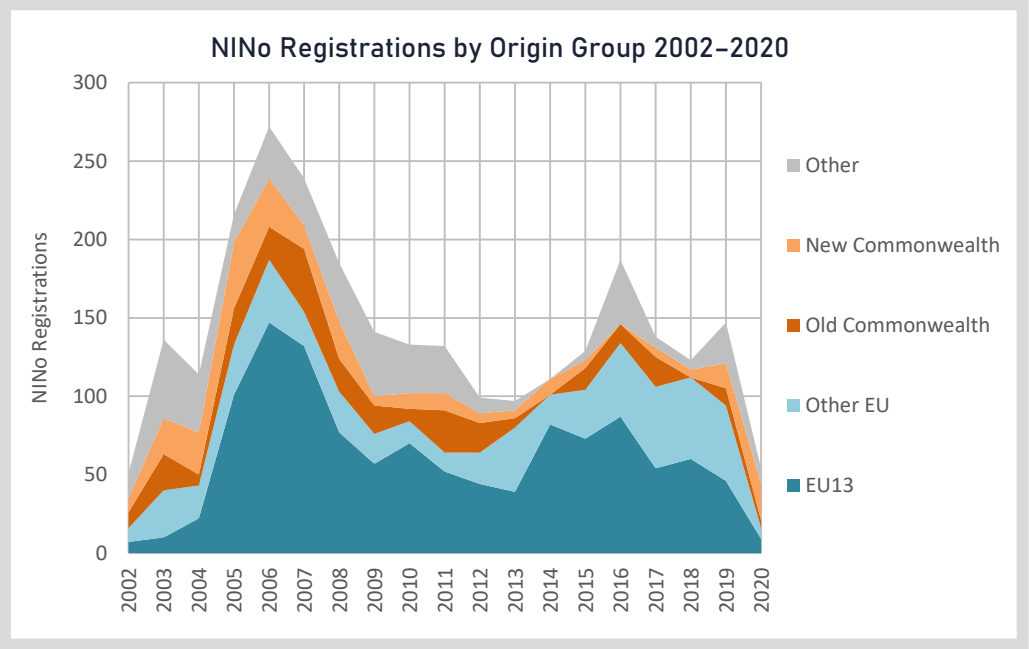


Figure 14: Monmouthshire UA - NINo registrations by country of origin, 2002-2020 (Source: DWP)

2.18 With the exception of 2016, total NINo registrations have fluctuated between 100–150 per year since the peak in 2006, with the large majority of migrants having a country of origin from within the European Union (EU). A result of the COVID-19 pandemic, 2020 has shown a sharp decline in all origin categories.

3 Demographic Scenarios

Scenario Definition

3.1 POPGROUP technology (see Appendix C) has been used to configure a suite of growth scenarios for Monmouthshire UA (summarised in Table 1). Additional detail on all scenario data inputs and assumptions is provided in Appendix E of this document.

3.2 The **WG** scenarios include the full suite of variants that make up the 2018-based WG projections.

3.3 POPGROUP (**PG**) trend scenarios consider growth outcomes based on a continuation of long-term migration histories (**PG Long Term**), incorporating a **2020** base year. Alternative **PG Long Term** scenarios are presented, evaluating the potential effects of higher net in-migration associated with the relaxation of Severn Bridge tolls (**PG Long Term Adj**).

3.4 The **Dwelling-led** scenarios, with a **2020** base year, consider how a continuation of a 5-year, 10-year, and 15-year history of housing completion rates would impact upon future population growth in Monmouthshire LPA. An alternative **dwelling-led** scenario is presented, evaluating the potential impact of +4,275 total additional dwellings in Monmouthshire LPA, over the plan period 2018–2033 (**Dwelling-led (285 dpa)**). In each **Dwelling-led** scenario, dwelling growth in the BBNP is estimated from the WG's 2018-based projections (at an average of +16 dpa).

3.5 An extended range of **Employment-led** scenarios have also been configured for Monmouthshire UA. These scenarios are presented separately in Section 4.

3.6 In each scenario, household and dwelling growth is estimated using assumptions from the WG 2018-based household projection model. An additional household membership rate return (**MR**) has been applied to all demographic scenarios, considering the impact of higher household formation in the young adult age-groups. The household membership rates for the young adult age-groups (19–24, 25–29, 30–34) have been 'returned' to their respective 2001 level over the 2018–2033 plan period.

3.7 In modelling the relationship between households and dwellings, vacancy rate of 4.5% has been applied, derived from 2011 Census statistics for Monmouthshire UA.

3.8 Under each scenario, population, household, migration, dwelling and employment growth is presented over a 2018–2033 plan period, in line with Monmouthshire's RLDP period.

3.9 All scenario outcomes are summarised in Appendix A. For population, household, net migration and dwelling growth outcomes for Monmouthshire LPA (i.e. *excluding* the BBNP), please refer to Appendix C.

Table 1: Scenario Definition

1.	WG-2018 (Principal)	Replicates the WG 2018-based *Principal* population projection, using historical population evidence for 2001-2018.
2.	WG-2018 (High)	Replicates the WG 2018-based *High* population projection, using historical population evidence for 2001-2018.
3.	WG-2018 (Low)	Replicates the WG 2018-based *Low* population projection, using historical population evidence for 2001-2018.
4.	PG Long Term	Uses an ONS 2020 MYE base year, with area-specific fertility and mortality assumptions derived from the WG 2018-based Principal projection. Migration assumptions are derived from a 19-year historical period (2001/02–2019/20).
5.	PG Long Term Adj (5yr)	Uses an ONS 2020 MYE base year, with area-specific fertility and mortality assumptions derived from the WG 2018-based Principal projection. Internal in-migration rates are adjusted to include higher in-migration from Bristol and South Gloucestershire in the period following the removal of the Severn Bridge toll (based on the last 5-years). All other migration flows are consistent with the **PG Long Term** scenario.
6.	PG Long Term Adj (2yr)	Uses an ONS 2020 MYE base year, with area-specific fertility and mortality assumptions derived from the WG 2018-based Principal projection. Internal in-migration rates are adjusted to include higher in-migration from Bristol and South Gloucestershire in the period following the removal of the Severn Bridge toll (based on the last 2-years). All other migration flows are consistent with the **PG Long Term** scenario.
7.	Net Nil	Uses an ONS 2020 MYE, with area-specific fertility and mortality assumptions derived from the WG 2018-based Principal projection. Internal and international migration flows are balanced between in- and out-flows, resulting in zero net migration.
8.	Dwelling-led (5yr)	Using an ONS 2020 MYE base year, this scenario models the population impact of future dwelling growth. In Monmouthshire LPA, historical completions are applied up to 2020/21 and average annual dwelling growth of +347 dpa applied thereafter, based on a 5-year history of housing completions. Inside the BBNP, average annual dwelling growth of +16 dpa is applied, based on the WG's 2018-based projection.
9.	Dwelling-led (10yr)	Using an ONS 2020 MYE base year, this scenario models the population impact of future dwelling growth. In Monmouthshire LPA, historical completions are applied up to 2020/21 and average annual dwelling growth of +300 dpa applied thereafter, based on a 10-year history of housing completions. Inside the BBNP, average annual dwelling growth of +16 dpa is applied, based on the WG's 2018-based projection.

10.	Dwelling-led (15yr)	Using an ONS 2020 MYE base year, this scenario models the population impact of future dwelling growth. In Monmouthshire LPA, historical completions are applied up to 2020/21 and average annual dwelling growth of +279 dpa applied thereafter, based on a 15-year history of housing completions. Inside the BBNP, average annual dwelling growth of +16 dpa is applied, based on the WG's 2018-based projection.
11.	Dwelling-led (285 dpa)	Using an ONS 2020 MYE base year, this scenario models the population impact of future dwelling growth. In Monmouthshire LPA, historical completions are applied up to 2020/21 and average annual dwelling growth of +255 dpa applied thereafter, ensuring total dwelling growth of +4,275 over the plan period[4] (averaging +285 dpa). Inside the BBNP, average annual dwelling growth of +16 dpa is applied, based on the WG's 2018-based projection.

Scenario Summary

3.10 The 2001–2033 population growth trajectories for all demographic scenarios are presented in Figure 15. In Table 2, each of the demographic scenarios is summarised in terms of population and household growth for the 2018–2033 RLDP period, alongside the average annual net migration and dwelling growth outcomes.

3.11 Population change for the 2018–2033 period ranges from -5.4% under the **Net Nil** scenario to 12.1% under the **Dwelling-led (5yr)** scenario. Over the plan period, this range of population growth equates to an estimated dwelling growth requirement of -80 to +374 dpa.

[4] For the **Dwelling-led (285 dpa)** scenario, dwelling growth targets have been defined by Monmouthshire County Council.

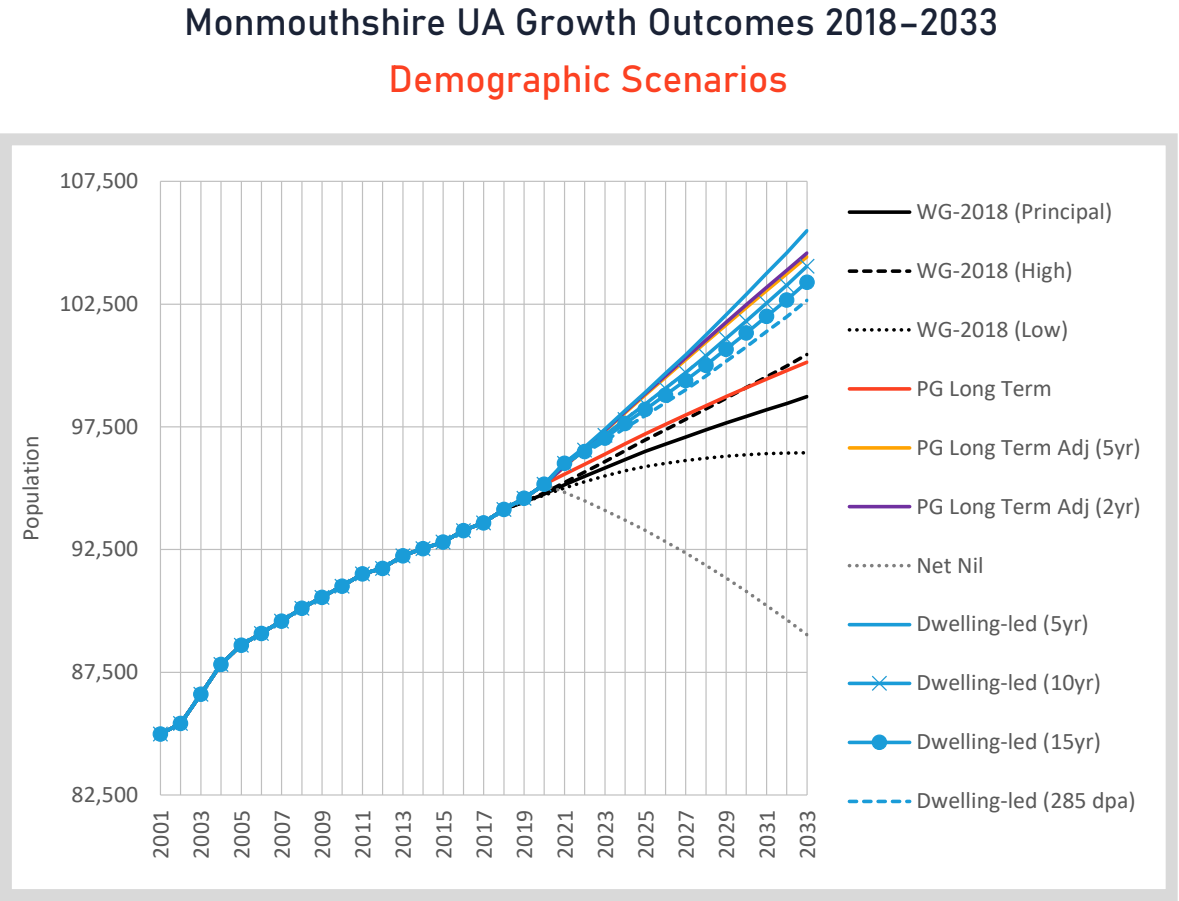


Figure 15: Monmouthshire UA - Population Growth Scenarios, 2001-2033 (Source: POPGROUP modelling)

Table 2: Monmouthshire UA - Demographic Scenario Growth Outcomes, 2018–2033
(Source: POPGROUP modelling)

Scenario	Change 2018–2033				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Employment
Dwelling-led (5yr)	11,350	12.1%	5,175	12.9%	1,123	374	389
PG Long Term Adj (2yr)	10,440	11.1%	4,846	12.1%	1,077	338	355
PG Long Term Adj (5yr)	10,285	10.9%	4,788	11.9%	1,068	334	350
Dwelling-led (10yr)	9,903	10.5%	4,636	11.6%	1,034	336	336
Dwelling-led (15yr)	9,257	9.8%	4,395	11.0%	994	319	313
Dwelling-led (285 dpa)	8,510	9.0%	4,117	10.3%	948	300	286
WG-2018 (High)	6,309	6.7%	3,381	8.4%	774	236	190
PG Long Term	5,988	6.4%	3,189	8.0%	805	223	205
WG-2018 (Principal)	4,584	4.9%	2,732	6.8%	726	191	160
WG-2018 (Low)	2,306	2.4%	1,941	4.8%	677	136	129
Net Nil	-5,114	-5.4%	-1,139	-2.8%	110	-80	-171

Note: All scenario outcomes are presented for Monmouthshire UA as a whole. Trend and **Dwelling-led** scenario outcomes include the 2019 and 2020 mid-year population estimates. The **Dwelling-led** scenario outcomes include historical completions up to 2020/21, where available.

3.12 The **WG-2018 (Principal)** scenario results in a higher growth outcome (4.9%) compared to the previous WG 2014-based projection (0.8%), despite the introduction of dampened assumptions on fertility and mortality in the latest WG projections. Monmouthshire UA's recent history of higher net in-migration to the UA is the key drive of the higher growth outcome (Figure 16).

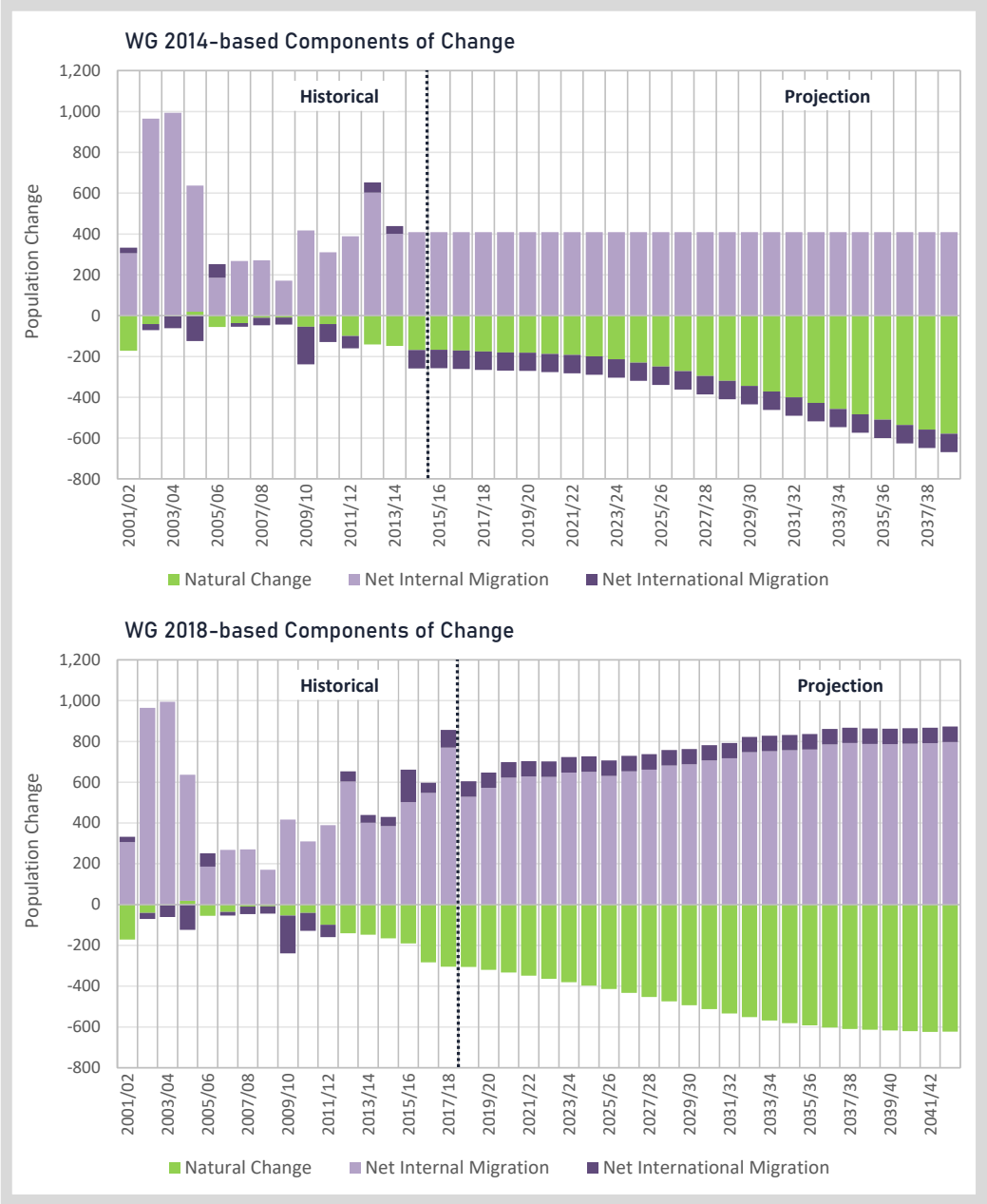


Figure 16: Monmouthshire UA - WG Principal Projections - Components of Population Change, 2001/02–2042/43 (Source: WG)

3.13 The **WG-2018 (Low)** and **WG-2018 (High)** scenarios provide alternative outcomes to the *Principal* projection, incorporating *Low* and *High* fertility, mortality and migration assumptions for Monmouthshire UA. The **WG-2018 (Low)** and **WG-2018 (High)** scenarios estimate population growth of 2.4% and 6.7% respectively, with an accompanying dwelling requirement of +136 and +236 dpa.

3.14 The **PG Long Term** scenario, drawing its migration assumptions from a 2001–2020 history, projects population growth of 6.4% and a dwelling requirement of +223 dpa. With the adjustment of internal in-migration rates to reflect higher in-migration from Bristol and South Gloucestershire (based on a 5-year or 2-year history), the **PG Long Term Adj (5yr)** and **PG Long Term Adj (2yr)** scenarios estimate higher population growth of 10.9% and 11.1% respectively and a dwelling requirement of +334 dpa and +338 dpa.

3.15 The **Net Nil** scenario, which assumes *balanced* net migration over the plan period, estimates population decline of -5.4% over the plan period. As a result, this scenario estimates a surplus in current dwelling stock.

3.16 The **Dwelling-led (15yr)**, **Dwelling-led (10yr)**, and **Dwelling-led (5yr)** scenarios, which continue the average rate of historical completions in Monmouthshire LPA and assume trend-based dwelling growth inside BBNP, estimate population growth of 9.8%, 10.5% and 12.1% respectively, with average net migration of +994, +1,034 and +1,123.

3.17 The **Dwelling-led (285 dpa)** scenario, assuming total dwelling growth of +4,275 in Monmouthshire LPA (2018–2033) and trend-based dwelling growth inside the BBNP, estimates population growth of 9.0%, with average net migration of +948.

Membership Rate Sensitivity

3.18 Although the latest evidence continues to suggest that the level of household formation has fallen from historical levels, many LDPs are responding to national policy initiatives aimed at reversing this trend. It is likely that it is the younger age-groups that have seen the most significant change in household formation, due to a combination of housing undersupply and affordability issues, which in some areas may have led to 'supressed' rates of household formation.

3.19 An alternative set of household membership rates (**MR**) has therefore been generated for Monmouthshire UA, in which the WG 2018-based rates for the young adult age-groups (19–24, 25–29, 30–34) have been adjusted to 'return' to their 2001 values between 2018–2033. This sensitivity analysis estimates how a return to higher household formation rates could manifest itself in higher dwelling growth outcomes for each scenario (Table 3).

3.20 For the **Dwelling-led** scenarios, the application of WG 2018-based 'return' household membership rates (**MR**) results in *lower* population growth outcomes over the plan period. In a **Dwelling-led** scenario, net migration is used to balance dwelling growth and population growth. With higher rates of household formation in Monmouthshire UA under the membership rate sensitivity (**MR**) scenario, a greater proportion of the additional dwellings are occupied by the resident population, resulting in a lower level of net migration, and therefore *lower* overall population growth.

Table 3: Monmouthshire UA - Population & Dwelling Growth under alternative Household Membership Rates, 2018–2033 (Source: POPGROUP modelling)

Scenario	Change 2018–2033		Average Annual Dwelling Growth	
	Population Change	Population Change %	2018-based	MR
Dwelling-led (5yr)	11,350	12.1%	374	
Dwelling-led (10yr)	9,903	10.5%	336	
Dwelling-led (15yr)	9,257	9.8%	319	
Dwelling-led (285 dpa)	8,510	9.0%	300	
Dwelling-led (5yr) (**MR**)	9,469	10.1%		374
Dwelling-led (10yr) (**MR**)	8,094	8.6%		336
Dwelling-led (15yr) (**MR**)	7,480	7.9%		319
Dwelling-led (285 dpa) (**MR**)	6,771	7.2%		300
PG Long Term Adj (2yr)	10,440	11.1%	338	392
PG Long Term Adj (5yr)	10,285	10.9%	334	387
WG-2018 (High)	6,309	6.7%	236	288
PG Long Term	5,988	6.4%	223	274
WG-2018 (Principal)	4,584	4.9%	191	242
WG-2018 (Low)	2,306	2.4%	136	186
Net Nil	-5,114	-5.4%	-80	-40

Age Profiles

3.21 The changing age profile associated with Monmouthshire UA's future population growth is an important consideration in planning for housing and in the development of the resident labour force. The updated suite of demographic projections has incorporated both revised fertility and mortality assumptions from the WG 2018-based projections and updated mid-year population estimates. These factors have had an effect upon the resulting age-structure associated with Monmouthshire UA's projected population growth to 2033.

3.22 To illustrate, the lower growth **WG-2018 (Principal)** scenario is compared to the higher growth **Dwelling-led (5yr)** scenario (Figure 17). The age profiles for all other scenarios are presented in Appendix B.

3.23 Under both of these scenarios, the 60+ age-groups reveal a similar growth profile, a reflection of the fact is the ageing of the population is unavoidable, whichever scenario is being considered. The **Dwelling-led (5yr)** scenario estimates higher levels of growth (or smaller decline) in each of the school-age and younger adult age-groups, particularly 30–44 year-olds. The higher growth in these age-groups is particularly important when considering the link between Monmouthshire UA's population change and the size and profile of the resident labour force.

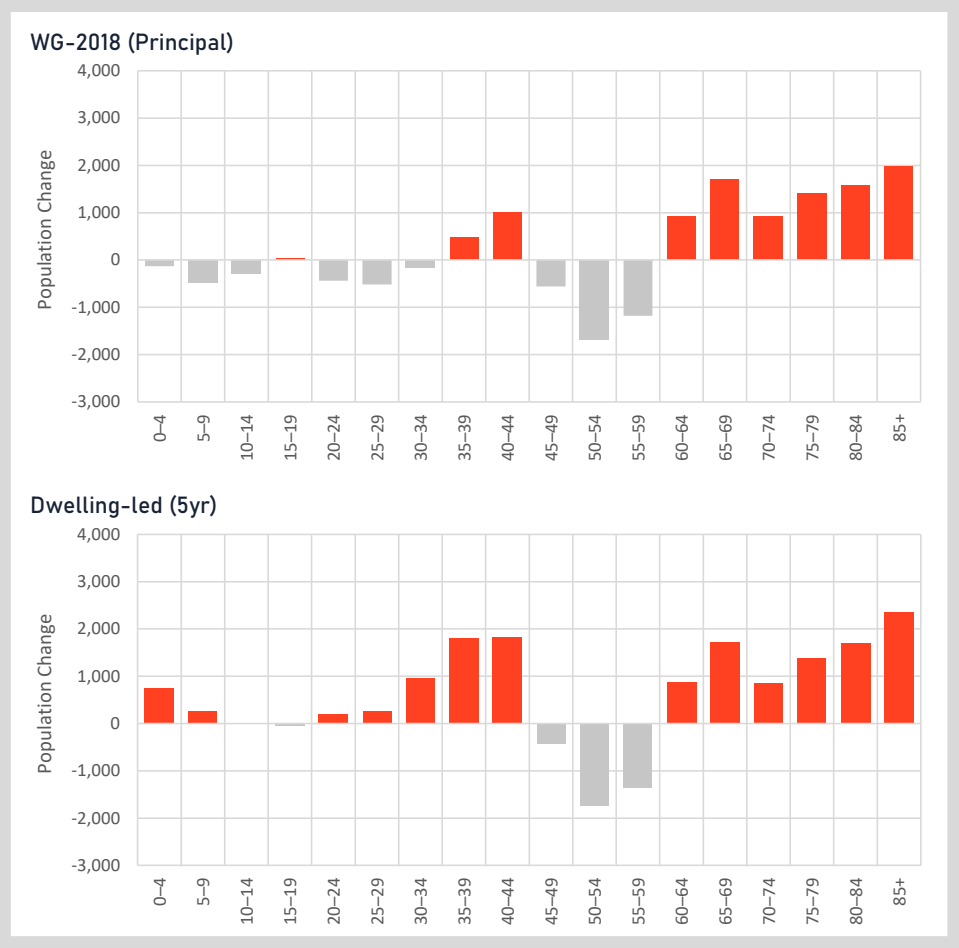


Figure 17: Monmouthshire UA - Population Change by Age-Group, 2018–2033 (Source: POPGROUP modelling)

Linking Population and Employment

3.24 The estimated impact of each demographic scenario upon employment growth in Monmouthshire UA, is presented for the plan period 2018–2033. In each scenario, average annual employment growth has been estimated using 2011 Census economic activity rates adjusted in line with the latest Office for Budget Responsibility's (OBR) analysis of labour market trends in its 2018 Fiscal Sustainability Report[5]. A fixed 2011 Census commuting ratio has been applied (**CR_F**), plus a 2020 unemployment rate, also fixed throughout the plan period.

3.25 A commuting ratio sensitivity has also been applied to all scenarios (**CR_R**), evaluating the employment growth impact of a reduction in the net out-commute. Under this sensitivity, the commuting ratio reduces from its 2011 Census value (1.12) to 1.10 by the end of the plan period.

3.26 Over the 2018–2033 plan period, application of a fixed commuting ratio (**CR_F**) to each scenario results in a range of employment growth outcomes that varies from a decline of -171 per year under the **Net**

[5] OBR 2018 Fiscal Sustainability Report – July 2018

Nil scenario to average annual employment growth of +389 per year under the **Dwelling-led (5yr)** scenario (Figure 18).

3.27 When a reduction in the net out-commute is assumed (an increase in the level of employment available, relative to the number of resident workers), a *higher* level of average annual employment change is estimated under each scenario, as more of the resident population are assumed to live and be employed in Monmouthshire UA.

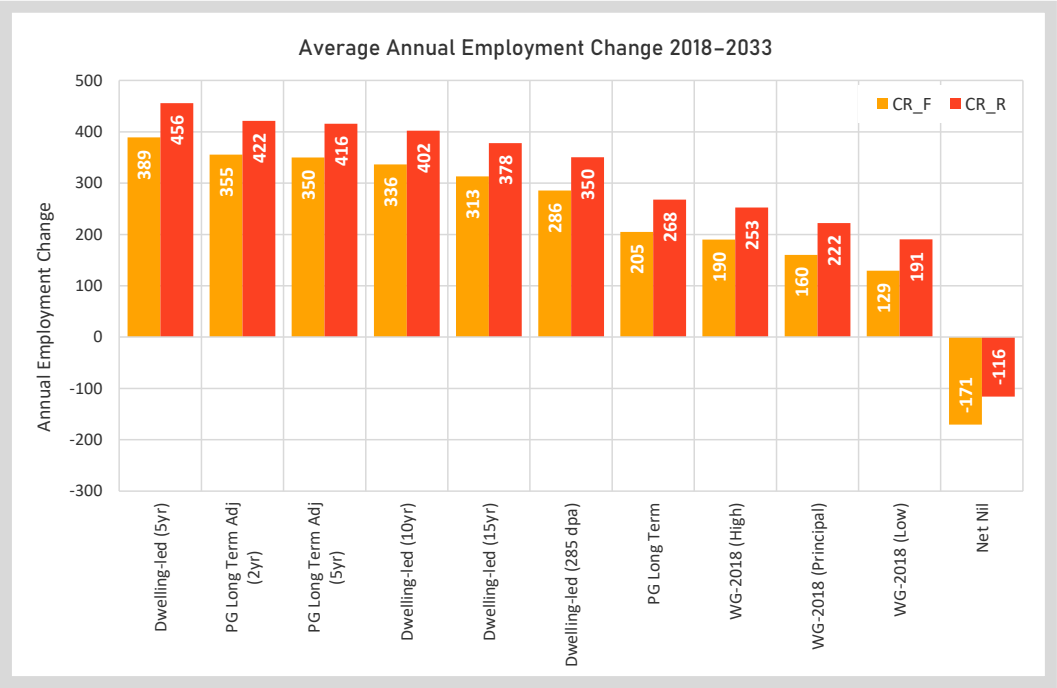


Figure 18: Monmouthshire UA - Average Annual Employment Change, 2018-2033
(Source: POPGROUP modelling)

3.28 The age-structure differences between the lower and higher growth scenarios result in a more positive impact upon labour force projections, with higher growth evident in the younger adult age-groups over the RLDP plan period.

3.29 The following section presents a range of **Employment-led** scenarios, for comparison to the demographic scenarios and their population, dwelling and employment outcomes.

4 Employment-led Scenarios

Scenario Definition

4.1 The previous demographic analysis informing Monmouthshire's RLDP formulation (June 2019 and November 2020) considered employment growth forecasts published by BE Group, Hatch and perConsulting as part of the 'Economies of the Future' report[6].

4.2 The analysis considered the potential impact of alternative employment growth scenarios: a 'Baseline' scenario underpinned by an Oxford Economics 2018 forecast; plus, accelerated growth scenarios referred to as 'UK Growth Rate' and 'Radical Structural Change'.

4.3 Whilst the employment growth forecasts have not been updated since the 2018 analysis, the 'Baseline', 'UK Growth Rate' and 'Radical Structural Change' employment growth forecasts have been used here to configure a range of updated **Employment-led** scenarios for Monmouthshire UA.

4.4 The updated **Employment-led** scenarios use a **2020** base year and incorporate the latest fertility and mortality assumptions from the WG 2018-based '*Principal*' projection. The scenarios model the population, household, and dwelling growth outcomes of the employment growth forecasts, and consider a reduction in the net out-commute (Table 4).

4.5 For all scenarios, household and dwelling growth is estimated using assumptions from the WG 2018-based household projection model. In modelling the relationship between households and dwellings, vacancy rate of 4.5% has been applied, derived from 2011 Census statistics for Monmouthshire UA.

4.6 Under each **Employment-led** scenario, population, household, migration, dwelling and employment growth is presented over a 2018–2033 plan period, in line with Monmouthshire's RLDP period.

4.7 All scenario outcomes are summarised in Appendix A. For population, household, net migration and dwelling growth outcomes for Monmouthshire LPA (i.e. *excluding* the BBNP), please refer to Appendix C.

[6] BE Group, Hatch, perConsulting 2018 Future Monmouthshire: Economies of the Future

Table 4: Employment-led Scenario Definition

11.	Employment-led Baseline (CR_R)	Average annual employment growth of +68 is applied from 2020/21 onward, based on the 2018 Oxford Economics 'Baseline' forecast. Commuting ratio reduces from 2011 Census value (1.12) to 2001 Census value (1.10) over the plan period.
12.	Employment-led UK Growth Rate (CR_R)	Average annual employment growth of +148 is applied from 2020/21 onward, incorporating uplifts in identified underperforming sectors to match UK growth levels. Commuting ratio reduces from 2011 Census value (1.12) to 2001 Census value (1.10) over the plan period.
13.	Employment-led Radical Structural Change (Lower) (CR_R)	Average annual employment growth of +251 is applied from 2020/21, to consider the potential impact of substantial economic changes in Monmouthshire UA's economy. Commuting ratio reduces from 2011 Census value (1.12) to 2001 Census value (1.10) over the plan period.
14.	Employment-led Radical Structural Change (Higher) (CR_R)	Average annual employment growth of +538 is applied from 2020/21, to consider the potential impact of substantial economic changes in Monmouthshire UA's economy. Commuting ratio reduces from 2011 Census value (1.12) to 2001 Census value (1.10) over the plan period.

Scenario Summary

4.14 The 2001–2033 population growth trajectories for all scenarios are presented in Figure 19. In Table 5, each of the **Employment-led** scenarios is summarised in terms of population and household growth for the 2018–2033 RLDP period, alongside the average annual net migration and dwelling growth outcomes.

4.15 Assuming a reduction in the net-out commute (to 1.10) over the plan period, it is estimated that a population growth range of 2.4% to 15.1% would be required to support the employment growth range of +68 to +538 per year outlined in the **Employment-led Baseline (CR_R)** and **Employment-led Radical Structural Change (Higher) (CR_R)** scenarios. Over the plan period, this would result in an average dwelling growth requirement of +120 to +451 dpa.

4.16 The **Employment-led UK Growth Rate (CR_R)** scenario, assuming average annual employment growth of +148, estimates population growth of 4.5%, with average annual dwelling growth of +175 dpa.

4.17 The **Employment-led Radical Structural (Lower) (CR_R)** scenario, assuming average annual employment growth of +251, projects population growth of 7.3% over the plan period. This level of population growth would result in an average dwelling growth requirement of +249 dpa.

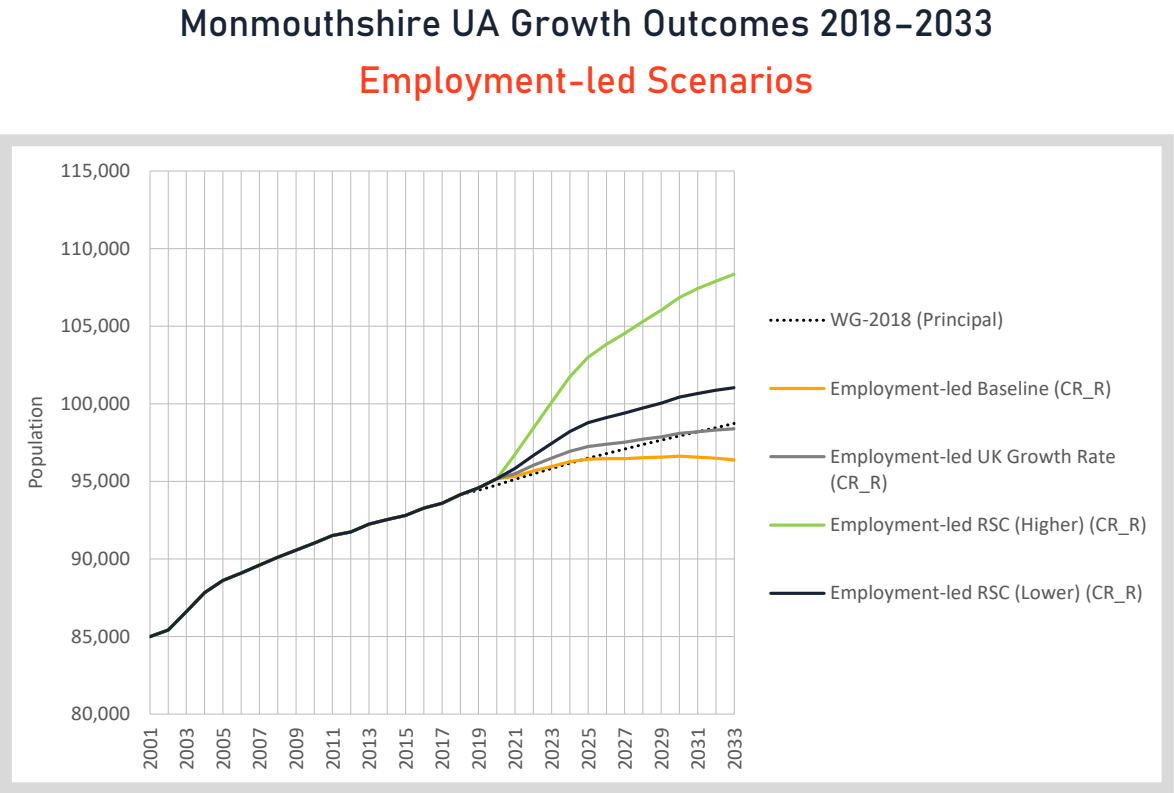


Figure 19: Monmouthshire UA - Employment-led Population Growth Scenarios, 2001–2033
(Source: POPGROUP modelling)

Table 5: Monmouthshire UA - Employment-led Scenario Growth Outcomes, 2018–2033
(Source: POPGROUP modelling)

Scenario	Change 2018–2033				Average per year	
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings
WG-2018 (Principal)	**4,584**	**4.9%**	**2,732**	**6.8%**	**726**	**191**
Employment-led RSC (Higher) (CR_R)	14,216	15.1%	6,465	16.1%	1,315	451
Employment-led RSC (Lower) (CR_R)	6,901	7.3%	3,564	8.9%	858	249
Employment-led UK Growth Rate (CR_R)	4,247	4.5%	2,509	6.3%	692	175
Employment-led Baseline (CR_R)	2,236	2.4%	1,714	4.3%	564	120

Note: All scenario outcomes are presented for Monmouthshire UA as a whole. **Employment-led** scenario outcomes include the 2019 and 2020 mid-year population estimates.

5 Summary

Growth Outcomes

5.1 Monmouthshire County Council is in the process of updating its RLDP. As part of this process, the Council has sought to collate the latest demographic evidence to inform its housing growth options. Monmouthshire UA's recent profile of population growth has been characterised by higher net in-migration, particularly from Bristol and South Gloucestershire, reflecting the recent uplift in housing completion rates. Even with the introduction of dampened assumptions on fertility and mortality in the latest round of WG projections and uncertainty surrounding international migration, its growth outlook is positive relative to the WG 2014-based evidence.

5.2 POPGROUP technology has been used to configure a suite of updated trend, **Dwelling-led** and **Employment-led** scenarios for Monmouthshire UA. Under each scenario, population, household, migration, dwelling and employment growth is presented over a 2018–2033 plan period.

5.3 Under the trend and **Dwelling-led** scenarios, household growth has been estimated using household membership rate assumptions from the WG's 2018-based household projection model, with the implications of a household membership rate sensitivity (**MR**) also evaluated. Under the **Employment-led** scenarios, household growth has been estimated using household membership rate assumptions from the WG's 2018-based household projection model. Associated dwelling growth has been estimated using a dwelling vacancy rate of 4.5% for Monmouthshire UA.

5.4 Estimates of the changing size of Monmouthshire UA's labour force and the employment growth that results from the variant population growth outcomes have been calculated using a combination of economic activity rates, an unemployment rate and a commuting ratio for the UA.

5.5 Over the 2018–2033 plan period, population change of -5.4% to 15.1% is estimated under the range of scenarios, with a corresponding household growth of -2.8% to 16.1%. The associated average annual dwelling growth ranges from -80 to +451 dpa (Figure 20).

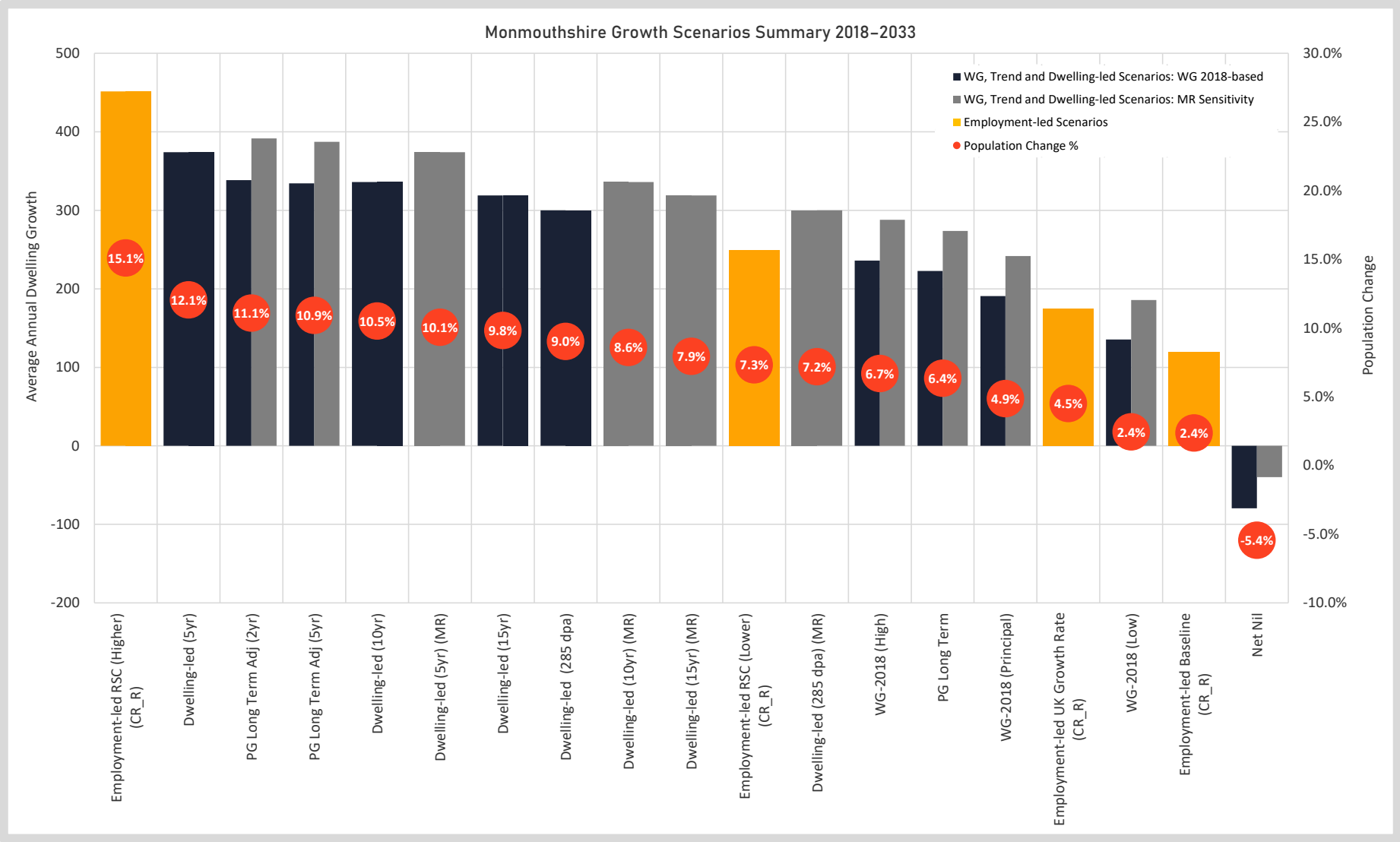


Figure 20: Monmouthshire UA - Growth Scenarios Summary, 2018-2033 (Source: POPGROUP modelling)

LDP Development and COVID-19

5.6 Following the political turbulence of Brexit, the global COVID-19 pandemic has resulted in an unprecedented interruption to the daily lives of all UK citizens. The updated growth scenarios, presented as evidence to inform the RLDP for Monmouthshire UA, have been formulated at a time of extraordinary social and economic upheaval. However, sustained economic and social recovery now appears to be a realistic outcome for 2022.

5.7 The latest round of WG projections have introduced a dampened outlook for fertility and mortality, with the recovery from COVID-19 likely to confirm this in the short-term. At the same, the future of international migration is highly uncertain due to both the continued COVID-19 restrictions and the introduction of the UK's new points-based system for immigration control. Nonetheless, Monmouthshire UA's recent profile of higher net internal in-migration, underpinned by an uplift in its housing completions, provide a positive growth outlook for the UA.

5.8 The COVID-19 pandemic resulted in the UK economy suffering its largest ever economic decline, with output falling almost 10% in 2020[7]. Whilst the pandemic has affected the daily lives of all communities, employment and earnings impacts have varied considerably across households, with some experiencing sharp falls in income and rising indebtedness whilst others, less affected by restrictions have been able to save considerable amounts.

5.9 Planning for the future development of housing at such a moment, presents a real challenge. However, there are now increasingly positive signs for the UK economic and society. The rapid rollout of effective vaccines has enabled the planned relaxation of COVID-19 restrictions, resulting in a faster-than-expected economic rebound in recent months[8]. The latest compilation of economic forecasts for the UK economy estimates GDP growth of +7% in 2021, and a further +5% in 2022[9]. The housing industry will be a critical component of the economic recovery and a key driver of the future growth and distribution of population.

5.10 Future Wales: The National Plan[10] has set the agenda for recovery in Wales to 2040, providing a strategy that addresses key national priorities, underpinned by an effective national planning system. Investment in infrastructure and services across Wales remains at the centre of the Plan, ensuring that future development and use of land contributes towards improving the economic, social, environmental and cultural well-bring of Wales. Conformity between national, regional and local development plans is imperative in achieving these aims.

5.11 Whilst the assessment of the long-term impact of COVID-19 upon demographic trends remains challenging, the latest scenario evidence provides a timely and robust suite of outcomes from which Monmouthshire County Council can consider its RLDP options.

[7] ONS 2021 GDP Monthly Estimate, UK: December 2020
[8] OBR 2021 Economic and Fiscal Outlook: October 2021
[9] HM Treasury 2021 Forecasts for the UK economic: October 2021
[10] WG 2021 Future Wales: The National Plan 2040

Appendix A Scenario Summary

Table 6: Monmouthshire UA - All Scenario Outcomes, 2018–2033 (Source: POPGROUP modelling)

Scenario	Change 2018–2033				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Employ-ment
Employment-led RSC (Higher) (CR_R)	14,216	15.1%	6,465	16.1%	1,315	451	538
Dwelling-led (5yr) (CR_R)	11,350	12.1%	5,175	12.9%	1,123	374	456
Dwelling-led (5yr)	11,350	12.1%	5,175	12.9%	1,123	374	389
PG Long Term Adj (2yr) (MR, CR_R)	10,440	11.1%	5,608	14.0%	1,077	392	422
PG Long Term Adj (2yr)	10,440	11.1%	4,846	12.1%	1,077	338	355
PG Long Term Adj (5yr) (MR, CR_R)	10,285	10.9%	5,548	13.8%	1,068	387	416
PG Long Term Adj (5yr)	10,285	10.9%	4,788	11.9%	1,068	334	350
Dwelling-led (10yr) (CR_R)	9,903	10.5%	4,636	11.6%	1,034	336	402
Dwelling-led (10yr)	9,903	10.5%	4,636	11.6%	1,034	336	336
Dwelling-led (5yr) (MR, CR_R)	9,469	10.1%	5,297	13.2%	1,007	374	387
Dwelling-led (5yr) (MR)	9,469	10.1%	5,297	13.2%	1,007	374	321
Dwelling-led (15yr) (CR_R)	9,257	9.8%	4,395	11.0%	994	319	378
Dwelling-led (15yr)	9,257	9.8%	4,395	11.0%	994	319	313
Dwelling-led (285 dpa) (CR_R)	8,510	9.0%	4,117	10.3%	948	300	350
Dwelling-led (285 dpa)	8,510	9.0%	4,117	10.3%	948	300	286
Dwelling-led (10yr) (MR, CR_R)	8,094	8.6%	4,758	11.9%	922	336	336
Dwelling-led (10yr) (MR)	8,094	8.6%	4,758	11.9%	922	336	271
Dwelling-led (15yr) (MR, CR_R)	7,480	7.9%	4,517	11.3%	884	319	313
Dwelling-led (15yr) (MR)	7,480	7.9%	4,517	11.3%	884	319	249
Employment-led RSC (Lower) (CR_R)	6,901	7.3%	3,564	8.9%	858	249	251
Dwelling-led (285 dpa) (MR, CR_R)	6,771	7.2%	4,239	10.6%	840	300	287
Dwelling-led (285 dpa) (MR)	6,771	7.2%	4,239	10.6%	840	300	223
WG-2018 (High) (MR, CR_R)	6,309	6.7%	4,123	10.3%	774	288	253
WG-2018 (High)	6,309	6.7%	3,381	8.4%	774	236	190
PG Long Term (MR, CR_R)	5,988	6.4%	3,919	9.8%	805	274	268
PG Long Term	5,988	6.4%	3,189	8.0%	805	223	205
WG-2018 (Principal) (MR, CR_R)	4,584	4.9%	3,462	8.6%	726	242	222
WG-2018 (Principal)	4,584	4.9%	2,732	6.8%	726	191	160
Employment-led UK Growth Rate (CR_R)	4,247	4.5%	2,509	6.3%	692	175	148
WG-2018 (Low) (MR, CR_R)	2,306	2.4%	2,660	6.6%	677	186	191
WG-2018 (Low)	2,306	2.4%	1,941	4.8%	677	136	129
Employment-led Baseline (CR_R)	2,236	2.4%	1,714	4.3%	564	120	68
Net Nil (MR, CR_R)	-5,114	-5.4%	-571	-1.4%	110	-40	-116
Net Nil	-5,114	-5.4%	-1,139	-2.8%	110	-80	-171

Appendix B Age Profiles

B.1 The age profiles for all demographic scenarios are presented (Figure 21), indicating the estimated population change by age-group over the plan period 2018–2033.

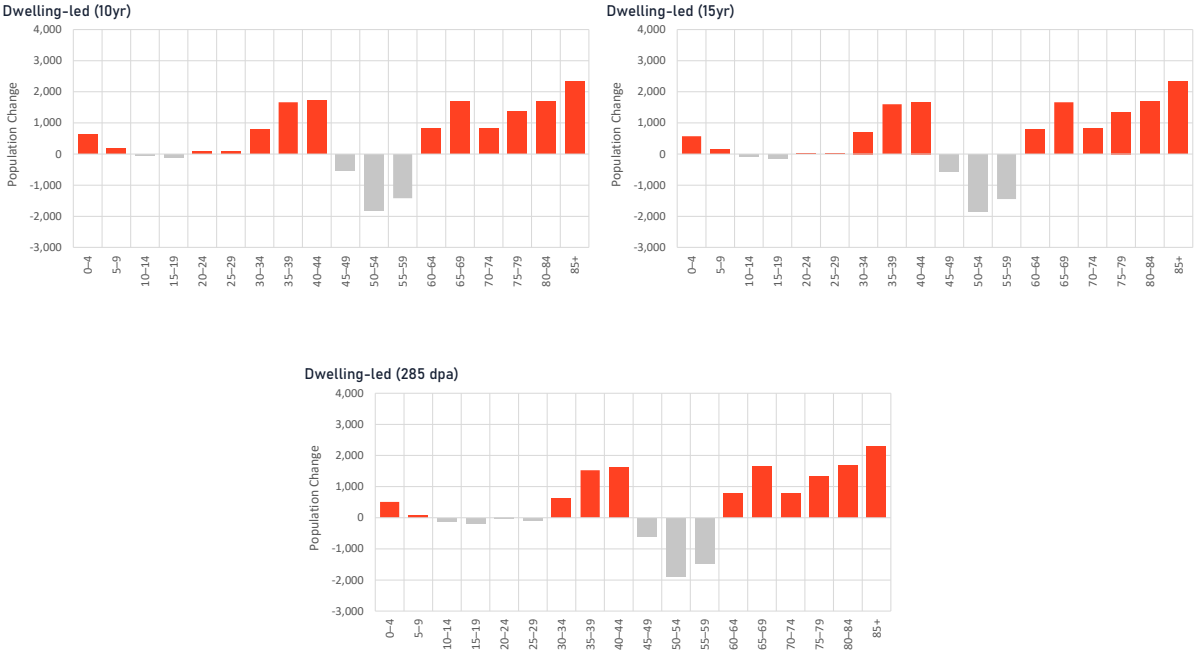


Figure 21: Monmouthshire UA - Age Profile for all Demographic Scenarios: Population Change, 2018–2033 (Source: POPGROUP modelling)

Appendix C Monmouthshire LPA

Scenario Outcomes

C.1 For Monmouthshire LPA (i.e. *outside* the BBNP), the population growth outcomes under each of the Council's chosen scenarios, plus all Dwelling-led scenarios, are presented in Figure 22 and Table 7.

C.2 Population growth for the 2018–2033 period ranges from -4.9% under the **Net Nil (MR, CR_R)** scenario to 15.0% under the **Employment-led RSC (Higher) (CR_R)** scenario. Over the plan period, this range of population growth has an associated dwelling growth requirement of -20 to 414 dpa.

C.3 The **WG-2018 (Principal)** scenario estimates population growth of 4.8%, with average annual dwelling growth of +177 dpa. Under the **WG-2018 (Principal) (MR, CR_R)** scenario, which incorporates the membership rate sensitivity (**MR**), a higher level of average annual dwelling growth is estimated, at +224 dpa.

C.4 The **PG Long Term Adj (5yr) (MR, CR_R)** scenario, assuming higher in-migration rates from Bristol and South Gloucestershire (based on a 5-year history), estimates population growth of 10.9% over the plan period. This scenario also incorporates the membership rate sensitivity (**MR**), resulting in average annual dwelling growth of +360 dpa.

C.5 Under the Dwelling-led scenarios (**Dwelling-led (5yr)**, **Dwelling-led (10yr)**, **Dwelling-led (15yr)**, and **Dwelling-led (285 dpa)**) population growth ranges from 9.3% under the **Dwelling-led (285 dpa)** scenario to 12.6% under the **Dwelling-led (5yr)** scenario. For the Dwelling-led scenarios, the application of the membership rate sensitivity (**MR**), results in *lower* population growth outcomes, ranging from 7.4% under the **Dwelling-led (285 dpa) (MR)** scenario to 10.5% under the **Dwelling-led (5yr dpa) (MR)** scenario.

Monmouthshire LPA Growth Outcomes 2018–2033

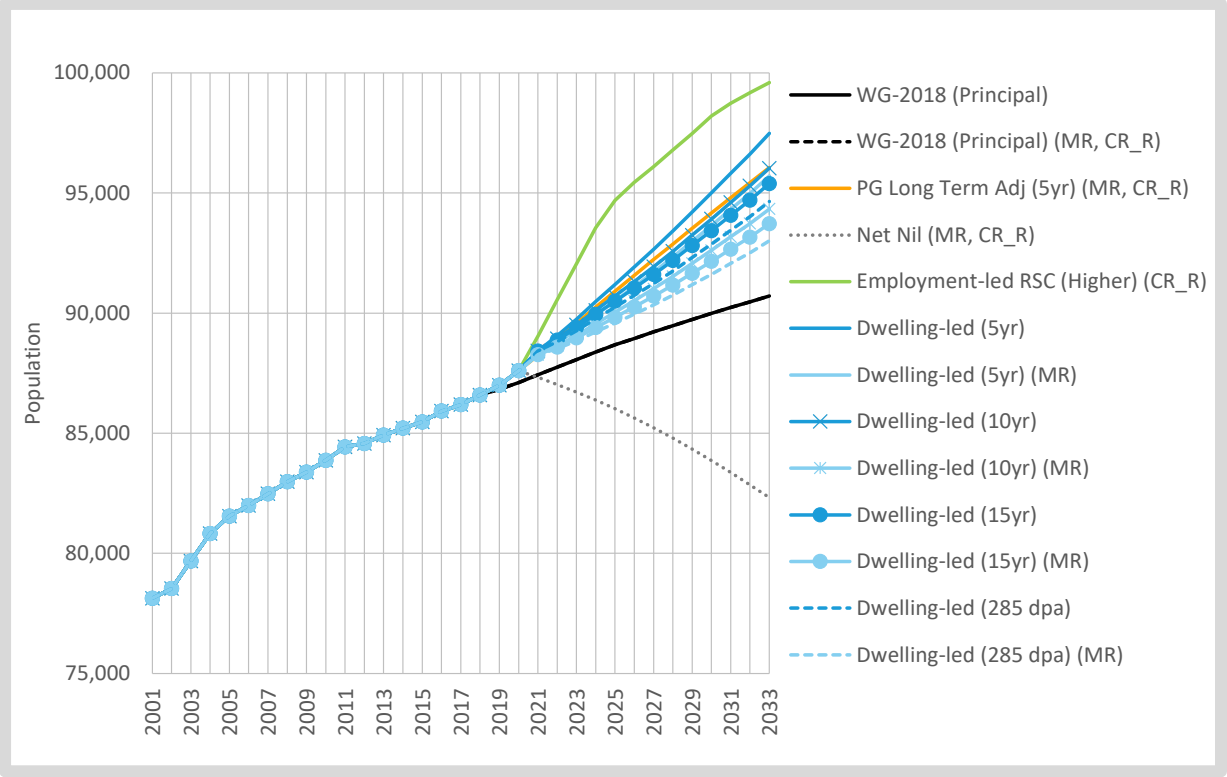


Figure 22: Monmouthshire LPA - Scenario Outcomes, 2001–2033 (Source: POPGROUP modelling)

Table 7: Monmouthshire LPA - Scenario Outcomes, 2018–2033 (Source: POPGROUP modelling)

Scenario	Change 2018–2033				Average per year	
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings
Employment-led RSC (Higher) (CR_R)	13,008	15.0%	5,944	16.2%	1,145	414
Dwelling-led (5yr)	10,894	12.6%	4,964	13.5%	1,003	359
PG Long Term Adj (5yr) (MR, CR_R)	9,475	10.9%	5,160	14.0%	932	360
Dwelling-led (10yr)	9,447	10.9%	4,425	12.0%	914	321
Dwelling-led (5yr) (MR)	9,121	10.5%	5,078	13.8%	895	359
Dwelling-led (15yr)	8,800	10.2%	4,185	11.4%	875	304
Dwelling-led (285 dpa)	8,054	9.3%	3,907	10.6%	829	285
Dwelling-led (10yr) (MR)	7,746	8.9%	4,540	12.3%	811	321
Dwelling-led (15yr) (MR)	7,132	8.2%	4,299	11.7%	773	304
Dwelling-led (285 dpa) (MR)	6,423	7.4%	4,021	10.9%	729	285
WG-2018 (Principal) (MR, CR_R)	4,131	4.8%	3,213	8.7%	610	224
WG-2018 (Principal)	4,131	4.8%	2,532	6.9%	610	177
Net Nil (MR, CR_R)	-4,273	-4.9%	-287	-0.8%	86	-20

Appendix D POPGROUP Methodology

D.1 Demographic forecasts have been developed using the POPGROUP suite of products. POPGROUP is a family of demographic models that enables forecasts to be derived for population, households and the labour force, for areas and social groups. The main POPGROUP model (Figure 23) is a cohort component model, which enables the development of population forecasts based on births, deaths and migration inputs and assumptions.

D.2 The Derived Forecast (DF) model sits alongside the population model (Figure 24) providing an associated model for both household and labour-force projections and the basis for the dwelling-led and employment-led scenario options.

D.3 For further information on POPGROUP, please refer to the Edge Analytics website: www.edgeanalytics.co.uk.

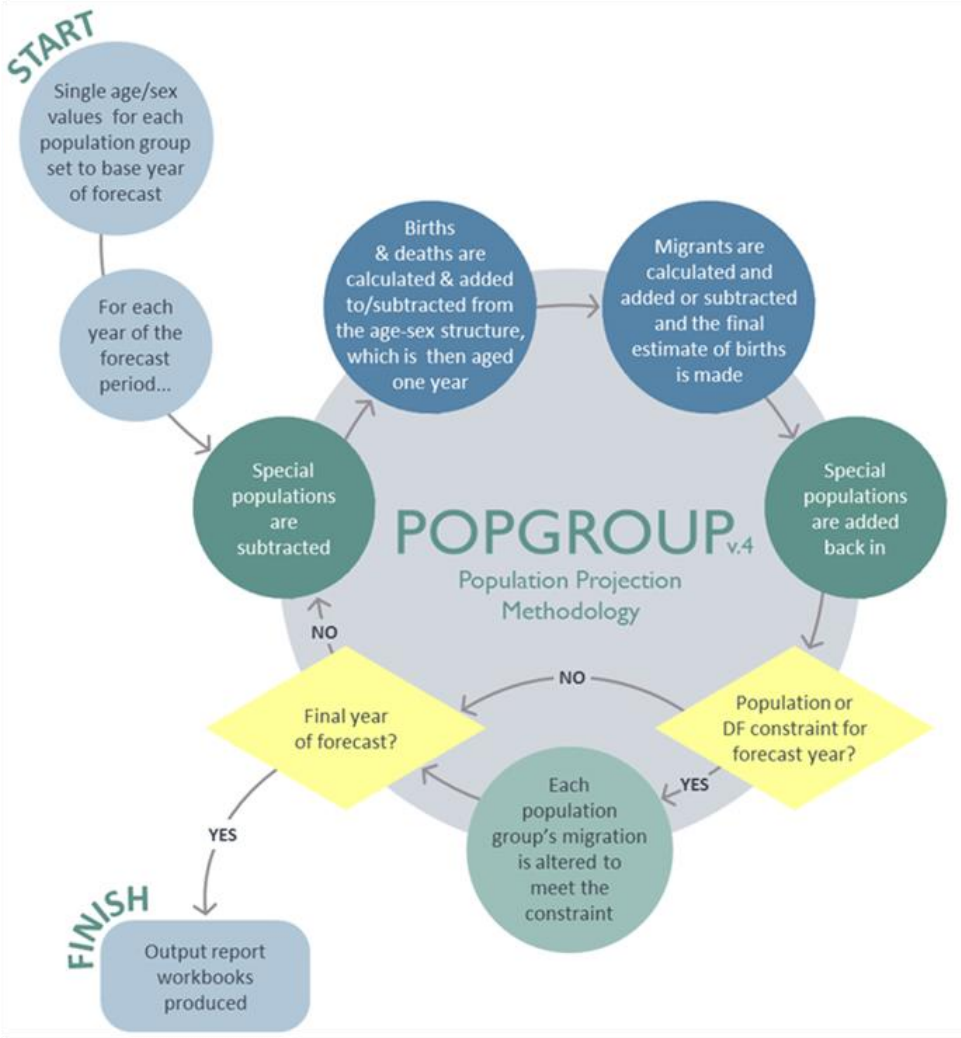
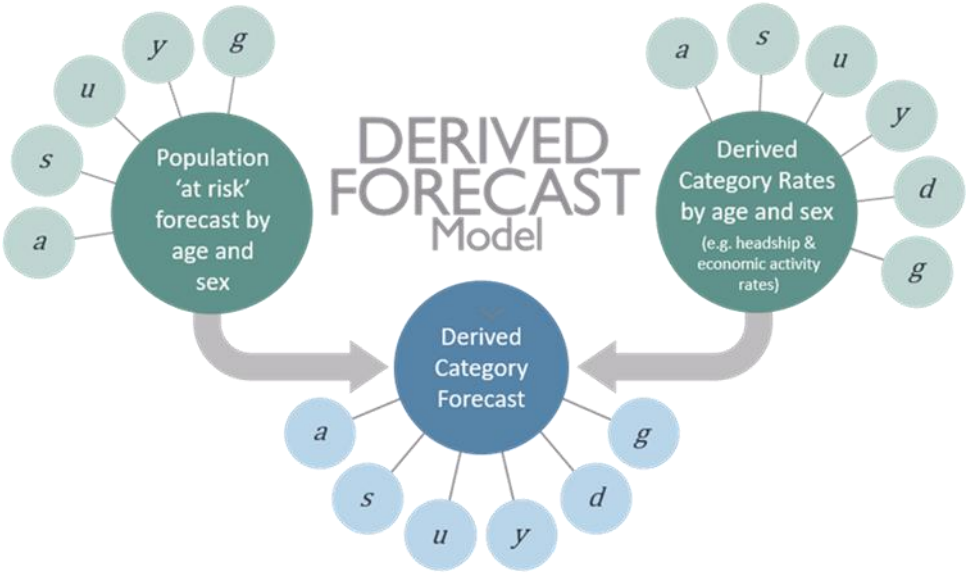


Figure 23: POPGROUP Population Projection Methodology (Source: Edge Analytics)



$$D_{a,s,u,y,d,g} = \frac{P_{a,s,u,y,g}\ R_{a,s,u,y,d,g}}{100}$$

D	Derived Category Forecast	y	Year
P	Population 'at risk' Forecast	d	Derived category
R	Derived Category Rates	g	Group (usually an area, but can be an ethnic group or social group)
a	Age-group		
s	Sex		
u	Sub-population		

Figure 24: Derived Forecast (DF) methodology (Source: Edge Analytics)

Appendix E Data Inputs & Assumptions

Population

E.1 In each scenario, historical population statistics are provided by ONS mid-year population estimates (MYE), with all data disaggregated by single year of age and sex. The **WG** scenarios use MYE populations up to the 2018 base year. Each of the trend, **Dwelling-led** and **Employment-led** scenarios uses an ONS 2020 MYE as its base year.

Births & Fertility

E.2 In each scenario, historical mid-year to mid-year counts of births by sex have been sourced from the ONS MYEs. Under the **WG** scenarios, historical births counts have been used up to 2018.

E.3 For the trend, **Dwelling-led** and **Employment-led** scenarios, birth counts are used from 2001/02 to 2019/20. From 2020/21, an area-specific and age-specific fertility rate (ASFR) schedule is derived from the WG 2018-based National Population Projections (NPP).

E.4 In combination with the 'population-at-risk' (i.e. all women between the ages of 15-49), these ASFR assumptions provide the basis for the calculation of births in each year of the forecast period.

E.5 In each of the **WG** scenarios, the future *counts* of births are specified from 2018 onwards to ensure consistency with the respective population growth outcomes.

Deaths & Mortality

E.6 In each scenario, historical mid-year to mid-year counts of deaths by sex and 5-year age group have been sourced from the ONS MYEs. Under the **WG** scenarios, historical deaths counts have been used up to 2018.

E.7 For the trend, **Dwelling-led** and **Employment-led** scenarios, death totals are used from 2001/02 to 2019/20. From 2020/21, an area-specific and age-specific mortality rate (ASMR) schedule is derived from the latest WG 2018-based NPP.

E.8 In each of the **WG** scenarios, the future counts of deaths are specified from 2018 onwards to ensure consistency with the respective population growth outcomes.

Internal Migration

E.9 In each scenario, historical mid-year to mid-year estimates of internal in- and out-migration by five-year age group and sex have been sourced from the 'components of change' data that underpin the ONS MYE statistics.

E.10 In the **WG** scenarios, these historical estimates are used up to 2018, with future counts of migrants specified to remain consistent with the corresponding projection.

E.11 For the trend, **Dwelling-led** and **Employment-led** scenarios, historical estimates are used up to 2020.

E.12 Under the **PG Long Term** and **PG Long Term Adj** scenarios, an area and age-specific migration rate (ASMigR) schedule is derived from the full 19-year history of internal migration data (2001/02–2019/20), which then determines the future number of internal in- and out-migrants for the remainder of the plan period.

E.13 Included in the **PG Long Term Adj** scenarios is an uplift to the internal *in-migration* schedule of rates, based on the last 2-years (**PG Long Term Adj (2yr)**) or the last 5-years (**PG Long Term Adj (5yr)**) of migration flows from Bristol and South Gloucestershire to Monmouthshire UA. The following steps summarise the method:

- **Step 1:** Calculate the historical 2-year (2018/19–2019/20) or historical 5-year (2015/16–2019/20) average migration flow from the combined Bristol & South Gloucestershire area to Monmouthshire UA.
- **Step 2:** Calculate the schedule of migration rates by single-year of age and sex based on a long-term migration history (2001/02–2019/20) but including the 'uplift' estimated in Step 1. This results in a higher migration schedule for Monmouthshire UA.
- **Step 3:** Apply the 'adjusted' schedule of migration rates to the respective **PG Long Term Adj** scenario to calculate future internal in-migration flows to Monmouthshire UA. Out-migration counts are consistent with the **PG Long Term** scenario.

E.14 In the **Net Nil** scenario, future internal migration counts are balanced to ensure that net internal migration is zero.

E.15 Under the **Dwelling-led** and **Employment-led** scenarios, future internal migration assumptions have been derived from the full 19-year historical period (**PG Long Term**), with migration altered to meet annual dwelling or employment growth requirements.

International Migration

E.16 Historical mid-year to mid-year counts of immigration and emigration by five-year age groups and sex have been sourced from the 'components of population change' data that underpin the ONS MYEs.

E.17 In the **WG** scenarios, these historical estimates are used up to 2018, with future counts of migrants specified directly from the projection statistics.

E.18 For the trend, **Dwelling-led** and **Employment-led** scenarios, historical estimates are used up to 2020.

E.19 In the **PG Long Term** and **PG Long Term Adj** scenarios, historical counts of immigration are used from 2001/02 to 2019/20. From 2020/21 onwards, an ASMigR schedule of rates is derived from a 19-year international migration history respectively and used to distribute future counts by single year of age and sex.

E.20 In the **Net Nil** scenario, future international migration counts are balanced to ensure that net international migration is zero.

E.21 For the **Dwelling-led** and **Employment-led** scenarios, future international migration assumptions are derived from the full 19-year historical period (**PG Long Term**).

Households & Dwellings

E.22 A household is defined as, "*one person living alone, or a group of people (not necessarily related) living at the same address who share cooking facilities and share a living room or sitting room or dining area*". A dwelling is defined as a unit of accommodation which can either be occupied by one household or vacant.

E.23 Apart from the **Dwelling-led** scenarios, the household and dwelling implications of each population growth trajectory have been estimated through the application of household membership rates, communal population statistics and a dwelling vacancy rate. These assumptions have been sourced from the 2011 Census and the WG's 2018-based household projection model.

E.24 In the **Dwelling-led** scenarios, these assumptions are used to determine the level of population growth required by the defined dwelling growth trajectory.

Membership Rates

E.25 The membership rates are used to calculate the proportion of the household population in each household category by age group and sex (Table 8), taken from the WG household model. The household population is converted into households using average household size assumptions, taken from the household model.

Table 8: WG Household Categories (Source: WG)

Household Category
1 person
2 person (No children)
2 person (1 adult, 1 child)
3 person (No children)
3 person (2 adults, 1 child)
3 person (1 adult, 2 children)
4 person (No children)
4 person (2+ adults, 1+ children)
4 person (1 adult, 3 children)
5+ person (No children)
5+ person (2+ adults, 1+ children)
5+ person (1 adult, 4+ children)

E.26 For each trend and **Dwelling-led** scenario, a membership rate sensitivity has been applied. Under the membership rate sensitivity (**MR**), an adjustment is applied to the household membership rates of the young adult age-groups (19–24, 25–29, 30–34). For these age-groups, the household membership rates 'return' to their 2001 values between 2018–2033.

Communal Population Statistics

E.27 Household projections in POPGROUP exclude the population 'not-in-households' (i.e. the communal/institutional population). These data are drawn from the WG household projection. Examples of communal establishments include prisons, residential care homes and student halls of residence.

E.28 For ages 0-74, the number of people in each age group 'not-in-households' is fixed throughout the forecast period. For ages 75-85+, the population not-in-households varies across the forecast period depending on the size of the population.

Vacancy Rate

E.29 The relationship between households and dwellings is modelled using a 'vacancy rate', derived from the 2011 Census using statistics on households (occupied household spaces) and dwellings (shared and unshared). A vacancy rate of 4.5% for Monmouthshire UA has been applied and fixed throughout the forecast period. Using the vacancy rate, the 'dwelling requirement' of each household growth trajectory has been evaluated.

Dwelling-led Scenarios

5.12 The **Dwelling-led** scenarios model the demographic impact of a pre-defined level of annual dwelling growth, configured using a sub-geography POPGROUP model, accounting for dwelling growth associated with Monmouthshire LPA and dwelling growth within BBNP. Under each **Dwelling-led** scenario, historical mid-year population estimates are used up to 2019/20 with the annual dwelling growth applied from 2020/21 onward.

5.13 For Monmouthshire LPA, the annual dwelling growth applied is presented in Figure 25, incorporating historical completions for 2020/21, followed by average annual dwelling growth thereafter.

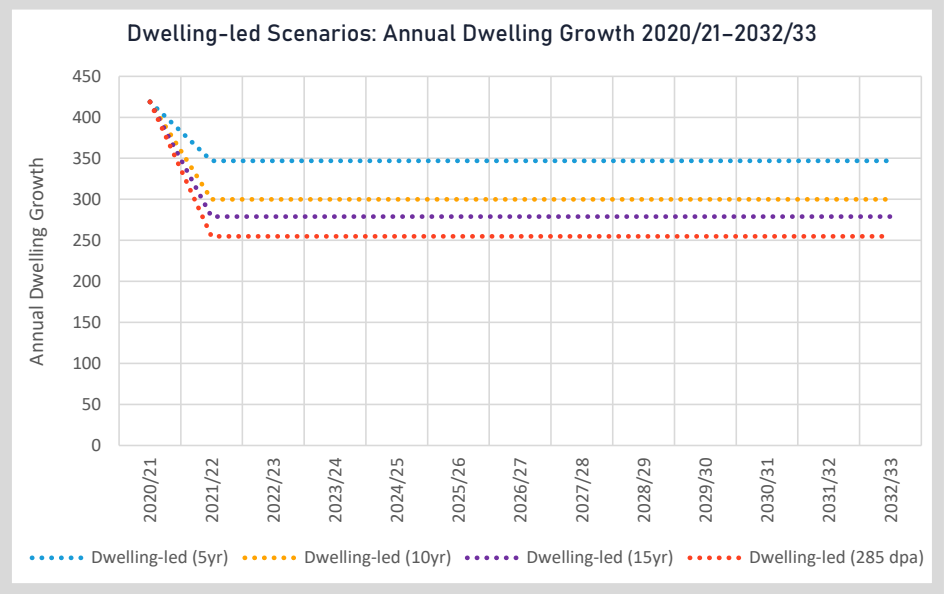


Figure 25: Monmouthshire LPA - Annual Dwelling Growth, 2020/21–2032/33 (Source: MCC)

5.14 For the area within the BBNP, average annual dwelling growth of +16 dpa is applied, based on the WG's 2018-based projections.

5.15 In running the **Dwelling-led** scenarios, household membership rates and vacancy rate assumptions are consistent with the WG, trend, and **Employment-led** scenarios. The household membership rate sensitivity (**MR**) has also been applied to all **Dwelling-led** scenarios.

Labour Force & Jobs

E.30 The labour force and jobs implications of each population growth trajectory have been estimated through the application of three key economic assumptions: economic activity rates, commuting ratio and an unemployment rate.

Economic Activity Rates

E.31 Economic activity rates are the proportion of the population that are actively involved in the labour force, either employed or unemployed and looking for work. Economic activity rates by five-year age group (ages 16-89) and sex for Monmouthshire UA have been derived from Census statistics, with adjustments made in line with the Office for Budget Responsibility's (OBR) analysis of labour market trends in its 2018 Fiscal Sustainability Report[11] (Figure 26).

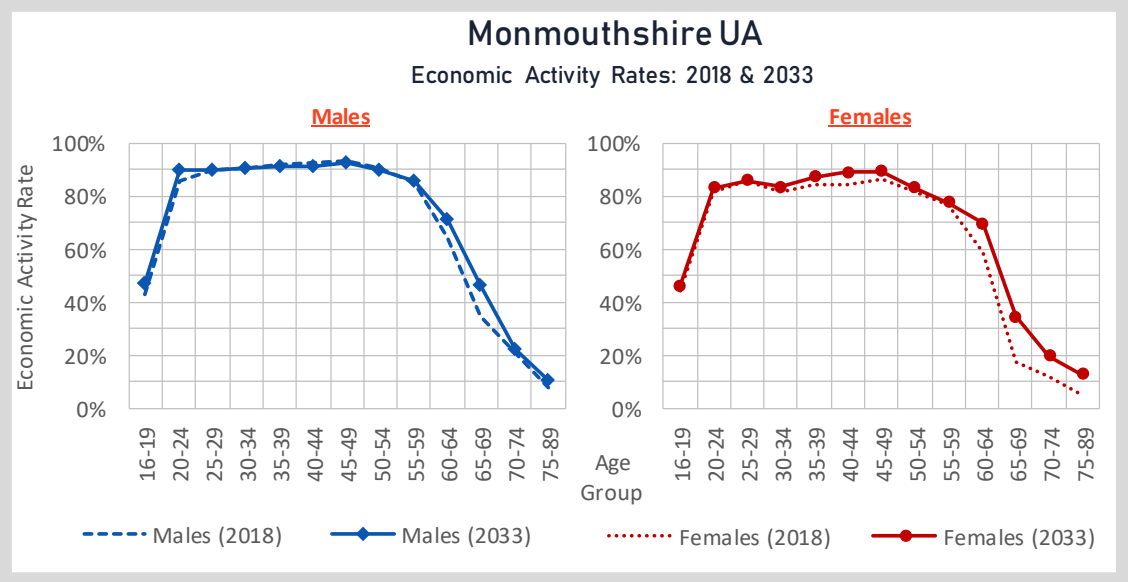


Figure 26: Monmouthshire UA - Economic Activity Rates, 2018-2033 (Source: 2011 Census, OBR)

Commuting Ratio

E.32 The commuting ratio indicates the balance between the level of employment and the number of resident workers. A commuting ratio greater than 1.00 indicates that the size of the resident workforce exceeds the level of employment available in the area, resulting in a net out-commute. A commuting ratio less than 1.00 indicates that employment in the area exceeds the size of the labour force, resulting in a net in-commute. The 2011 Census recorded 43,210 resident workers and 38,458

[11] OBR 2018 Fiscal Sustainability Report

jobs in Monmouthshire UA. This results in a commuting ratio of 1.12, which is applied in the WG, trend and **Dwelling-led** scenarios, fixed throughout the forecast period.

E.33 A commuting ratio sensitivity has also been applied to the WG, trend, **Dwelling-led** and **Employment-led** scenarios (**CR_R**). Under each scenario, the commuting ratio reduces from its 2011 Census value (1.12) to 1.10 by the end of the plan period.

Unemployment

E.34 The unemployment rate is the proportion of unemployed people within the total economically active population. Historical unemployment rates are sourced from ONS model-based estimates. For Monmouthshire UA, the 2020 rate of 2.6% has been applied in all scenarios, fixed throughout the forecast period.

Employment-led Scenarios

5.16 The **Employment-led** scenarios model the demographic impact of a pre-determined level of annual employment growth, measured as work-place based employment. Workplace-based employment is a 'people-based' measure, rather than a jobs measure of economic activity. The two measures are directly related, but the jobs-based measure is typically reported in employment forecasts, including both full-time and part-time positions. The workplace-based employment figure measures the number of people employed, linking directly to people-based measures of unemployment, commuting and economic activity.

E.35 The **Employment-led** scenarios (**Employment-led Baseline**, **Employment-led UK Growth Rate**, **Employment-led RSC (Higher)**, and **Employment-led RSC (Lower)**) model the demographic impact of the annual workplace-based employment growth outlined in the respective employment forecasts. Under each of the **Employment-led** scenarios, historical mid-year population estimates are used up to 2019/20 with the annual change in employment applied from 2020/21 onward, as illustrated in Figure 27.

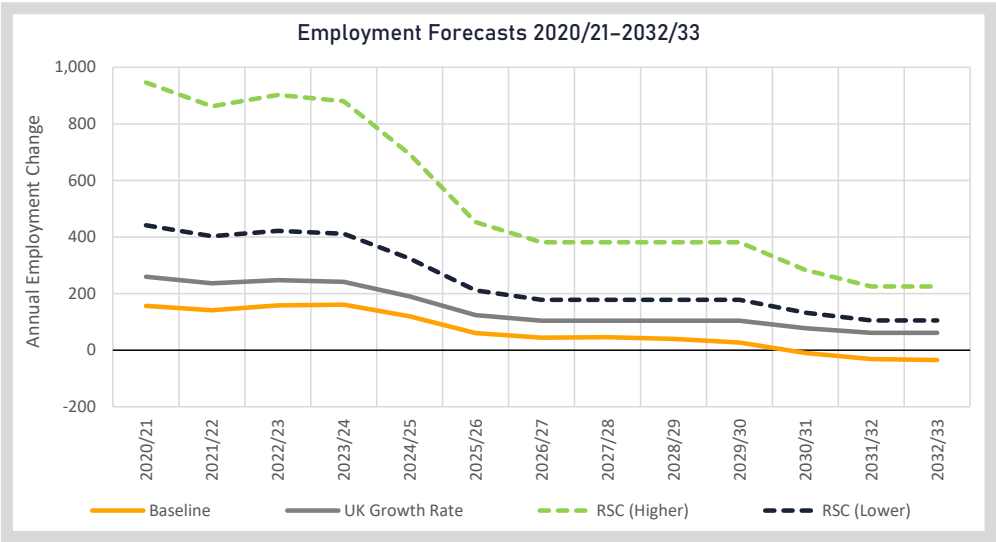
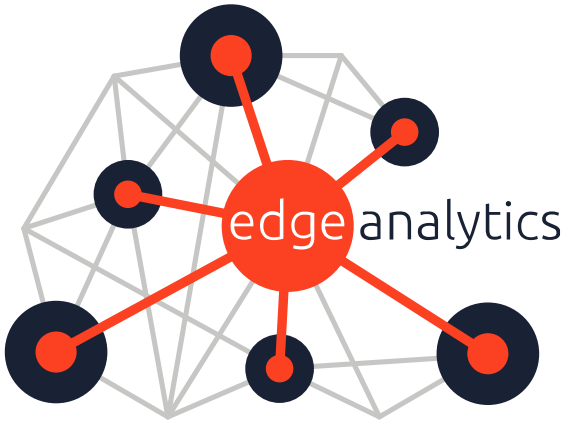


Figure 27: Monmouthshire UA - Annual Change in Employment, 2020/21–2032/33
(Source: Oxford Economics, 2018. Economies of the Future Report, 2018)

In running the **Employment-led** scenarios, economic activity rates and unemployment assumptions are consistent with the WG, trend and **Dwelling-led** scenarios. A commuting ratio adjustment has been applied to all **Employment-led** scenarios, reducing from its 2011 Census value (1.12) to the 2001 Census value (1.10) over the plan period.



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