# Powys County Council

## EVIDENCE TO INFORM THE POWYS RLDP

May 2024

**EDGE**ANALYTICS

# ACKNOWLEDGEMENTS

*The authors of this report do not accept liability for any costs or consequential loss involved following the use of the data and analysis referred to here; this is entirely the responsibility of the users of the information presented in this report.*

EDGEANALYTICS

# CONTENTS

EDGEANALYTICS

# **1**  INTRODUCTION

## Context

1.1  The Local Development Plan (LDP) for Powys was adopted in 2018, setting out Powys County Council's ('the Council') policies for the development and use of land in Powys. The LDP referred to Powys Local Planning Authority (LPA), the area of Powys Unitary Authority (UA) that is outside the Bannau Brycheiniog National Park (Brecon Beacons National Park, BBNP), and covered the period 2011–2026.

1.2  In line with the Welsh Government's (WG) Development Plans Manual, LPAs are required to review their LDP at least every four years from the date of adoption to ensure that LDPs support effective and consistent planning decisions, reflecting the latest available evidence.[1] Hence, Powys County Council is currently preparing a Replacement Local Development Plan (RLDP), which will set out development proposals for the period of 2022–2037.

1.3  To inform the development of its RLDP, the Council has commissioned Edge Analytics to provide a demographic evidence report for Powys, including a demographic profile of the area together with future projections of population, household, and employment growth. The demographic evidence should incorporate the 2018-based population and household projections from the WG (published in August 2020), plus the latest available evidence from the Office for National Statistics (ONS), including population and household results from the 2021 Census, the revised time-series of mid-year population estimates (MYEs) for the period 2012–2021[2], and the 2022 MYE.

1.4  The Council has requested that a suite of demographic scenarios is presented, including the WG 2018-based Principal and variant projections, alternative trend scenarios, dwelling-led scenarios and an employment-led scenario.

## Approach

1.5  Edge Analytics is a Data Science specialist, applying a combination of research, data, technology and analytical models to generate insight that better informs business planning and decision making.

1.6  Edge Analytics has a particular expertise in demographic modelling and forecasting, using its POPGROUP technology to formulate Local Plan evidence for Councils across England and Wales. This has included Local Plan studies for Newport City Council, Ceredigion County Council, Cardiff County Council, Pembrokeshire County Council, Monmouthshire County Council, Torfaen County Borough Council, Blaenau Gwent Borough Council, Carmarthenshire County Council and Bridgend County Borough Council.

1.7  Edge Analytics has used POPGROUP demographic forecasting technology and the latest demographic statistics to develop a range of scenarios for Powys, including the 2018-based Principal

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[1] WG March 2020 Development Plans Manual (Edition 3)
[2] ONS November 2023 Rebasing of mid-year population estimates following Census 2021, England and Wales

EDGE ANALYTICS

and variant projections from the WG, alternative trend, dwelling-led, and employment-led scenarios.[3] In line with the RLDP, evidence is presented for the 2022–2037 plan period.

## This Document

1.8     Section 2 of this report presents an area profile of Powys, describing historical and current demographic trends. This includes statistics from the 2021 Census, the ONS' 'rebased' MYEs and the 2022 MYE. Due to data availability, please note that the demographic statistics presented in this section relate to Powys UA, with the exception of the housing completions data, provided by the Council for Powys LPA.

1.9     Section 3 outlines the demographic scenarios developed for Powys using POPGROUP technology, with a summary of the key scenario outputs. The scenario outcomes in this section are presented firstly for Powys UA, followed by Powys LPA.

1.10    The Appendix includes detail on the POPGROUP forecasting methodology, as well as describing the scenario inputs and assumptions used by Edge Analytics.

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[3] Please note that the **Dwelling-led** and **Employment-led** scenarios have been configured for Powys LPA only, in line with the annual dwelling and employment growth targets available to the Council.

EDGE ANALYTICS

# 2    DEMOGRAPHIC PROFILE

## Geography

2.1    Powys UA is located in Mid Wales, bordering Gwynedd, Denbighshire, Wrexham to the north; the English counties of Shropshire and Herefordshire to the east; Monmouthshire, Blaenau Gwent, Merthyr Tydfil, Rhondda Cynon Taf and Neath Port Talbot to the south; and Carmarthenshire and Ceredigion to the west (Figure 1).



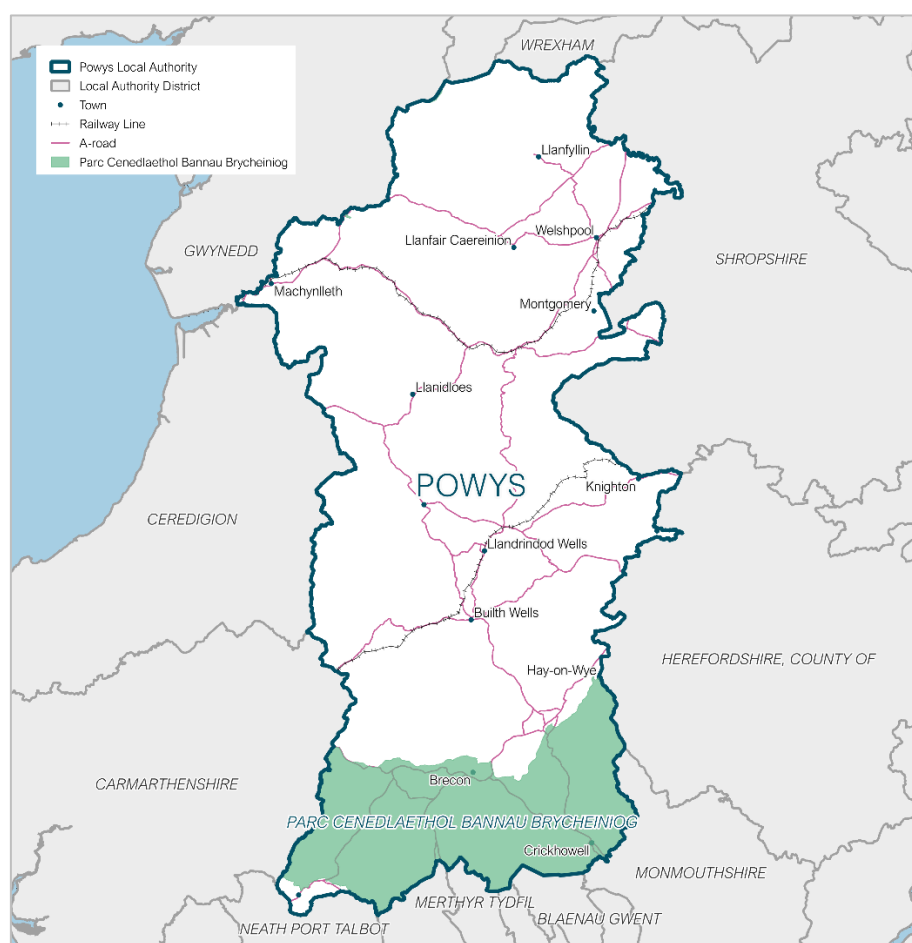Figure 1: Powys UA and the surrounding geographical area
Contains Ordnance Survey Data © Crown Copyright and database rights 2024

## Population

### 2021 Census Headlines

2.2    The initial population and household figures from the 2021 Census were released in June 2022. Since then, ONS have published more detailed population, migration and housing data, with some information still to be released.

2.3   At the 2021 Census, the population of Powys UA was 133,174, a 0.1% increase from the 2011 Census, equivalent to an additional 198 people (Figure 2). For Powys UA, intercensal population change between the 2011 and 2021 Censuses was greater than the regional average (-2.0%), but lower than the national average (1.4%).

2.4   Whilst the population of Powys UA has increased between each Census since 1971, the level of growth between each Census has continually declined, with the highest level of growth observed between the 1971 and 1981 Censuses, at 12.3%.
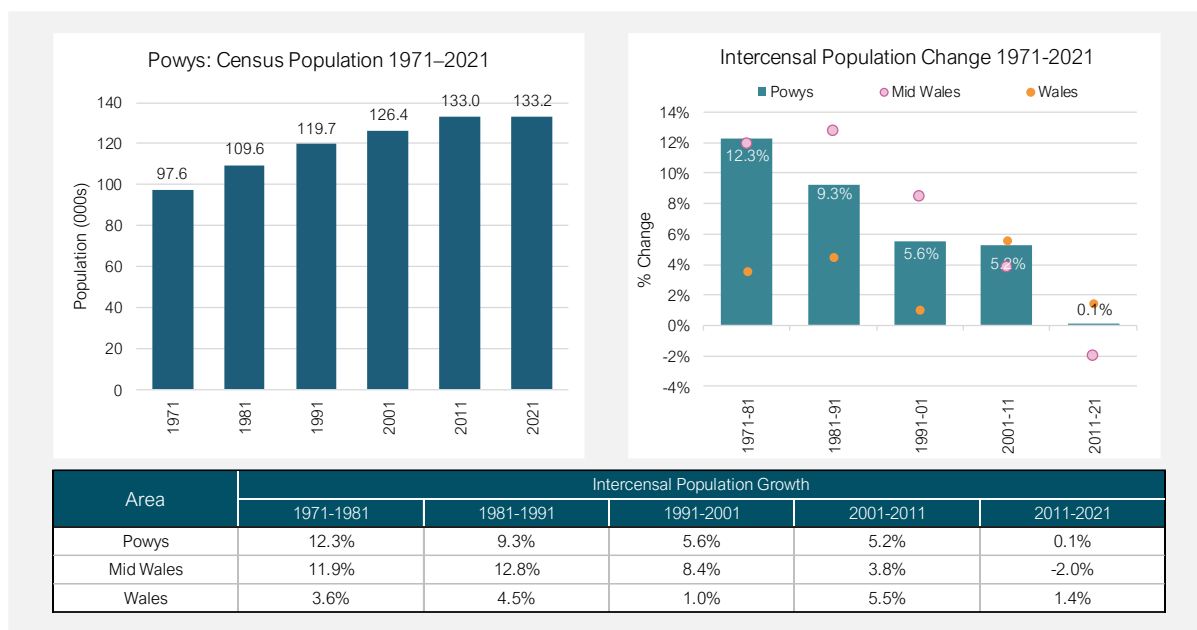


| Area | Intercensal Population Growth | | | | |
|---|---|---|---|---|---|
| | 1971-1981 | 1981-1991 | 1991-2001 | 2001-2011 | 2011-2021 |
| Powys | 12.3% | 9.3% | 5.6% | 5.2% | 0.1% |
| Mid Wales | 11.9% | 12.8% | 8.4% | 3.8% | -2.0% |
| Wales | 3.6% | 4.5% | 1.0% | 5.5% | 1.4% |

Figure 2: Powys Census population growth (1971–2021)
Source: ONS

## 2021 Census & MYE Data Releases

2.5   The 2021 Census provides an important update to our understanding of population characteristics at a local, regional and national level. It is, however, a snapshot in time; between successive Censuses, population estimation is necessary. The size and structure of the UK population is estimated by the ONS each year in its MYEs, derived by applying the 'components of population change' to the previous year's population. The components are natural change (the balance between births and deaths), net internal (domestic) migration, and net international (overseas) migration.

2.6   Starting with a Census estimate, the population is 'rolled-on' to mid-year (as the Census is typically taken in March), by adding the births, subtracting the deaths, and estimating the levels of in- and out-migration. In the following years, the same process is applied to produce each MYE, until another Census is carried out.

2.7   Following the 2021 Census, the ONS reviewed previous intercensal MYEs (i.e., MYEs between the 2011 and 2021 Censuses), and completed a reconciliation and rebasing process to better align the 2021 Census estimate with the 2011 Census. Where necessary, the intercensal MYEs, along with the

components of population change, were adjusted ('rebased') to ensure that the Census estimates were adequately aligned.[4]

2.8    The rebased MYE time series (2012–2021) was released by ONS in November 2023, replacing the 'previous' MYEs. At the same time, the 2022 MYE was also released. In this section, the ONS' rebased MYE time series and the 2022 MYE are presented.

## MYEs & Components of Change

### *Population*

2.9    The latest MYE for Powys UA (2022) estimates a population of 133,891, an increase of 0.3% from 2021 (Figure 3), equivalent to an additional 370 people. Powys UA's historical MYE profile is marked by two distinct periods of growth (Figure 4), from 2001 to 2008 and 2019 to 2022, with average annual growth of 924 (0.7%) and 778 (0.6%) respectively. Between 2009 and 2019, population change in Powys UA was characterised by comparatively low growth and, in some instances, population decline, with average annual population change of -119 (-0.1%).



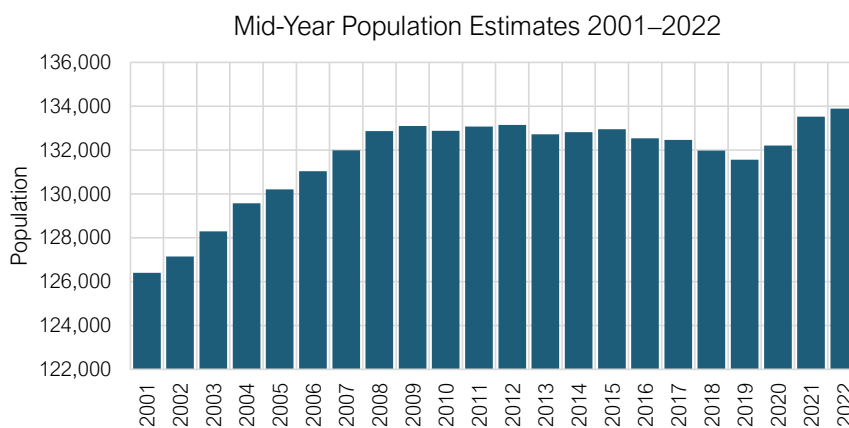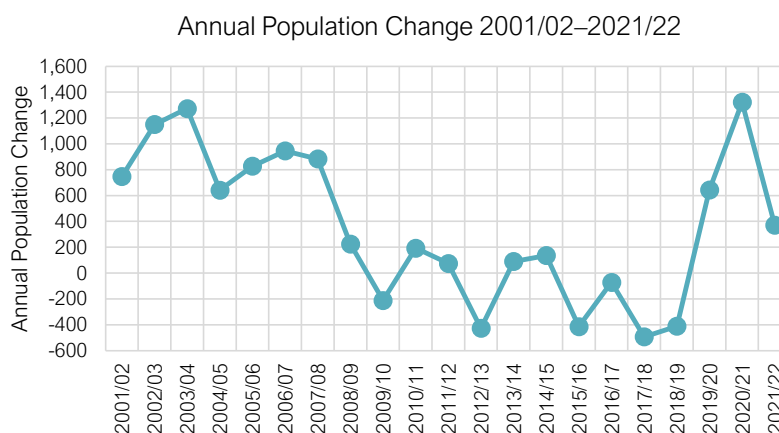Figure 3: Powys UA MYEs (2001–2022)
Source: ONS



Figure 4: Powys UA annual population change (2001/02–2021/22)
Source: ONS

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[4] ONS November 2023 Rebasing of mid-year population estimates following Census 2021, England and Wales

EDGEANALYTICS

2.10 Across Wales, population growth has occurred in most UAs between 2001 and 2022, with population decline occurring in just two of the 22 authorities (Figure 5), Ceredigion and Blaenau Gwent (-0.23% and -0.19%, respectively). At 0.27% per year, Powys UA experienced population growth slightly below the average for Wales (0.35%). Population growth has been highest in the urban areas of Cardiff and Newport, at 0.91% and 0.79%, respectively.
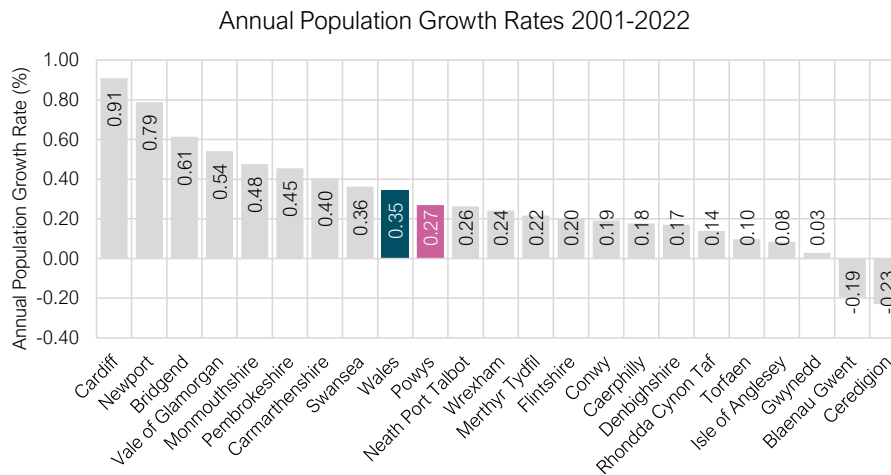


Figure 5: Average annual population change for local authorities in Wales (2001–2022)
Source: ONS

2.11 An index of population growth for each of the four broad age-groups reveals the important demographic changes that are taking place within Powys UA. Notably, Powys UA has an ageing population, with the population of those aged 65–79 and 80+ increasing by 49% and 50%, respectively, over the period 2001–2022 (Figure 6).

2.12 At the same time. the number of children in Powys UA (aged 0–14) has steadily declined since 2003, reducing by -16% in the period 2001–2022. The working age population (aged 15–64) has also declined over the historical period (-2%), with a period of growth up to 2009, followed by gradual decline up to 2022.
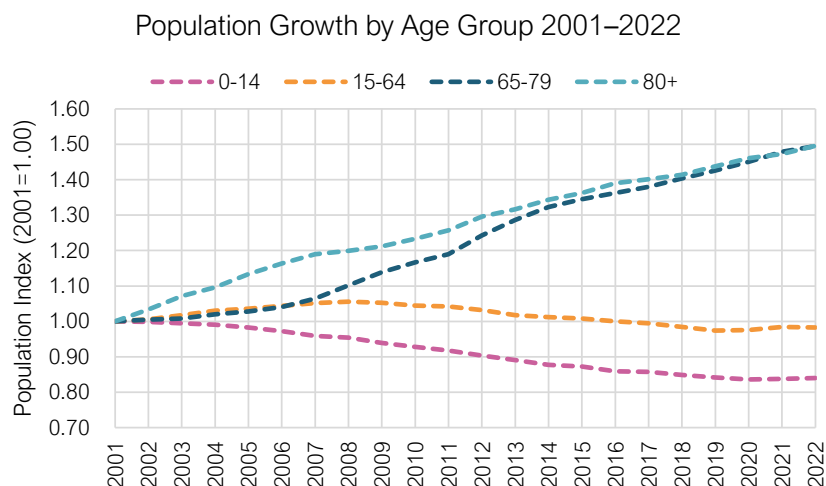


Figure 6: Powys UA population growth index by age group, (2001–2022)
Source: ONS

2.13    The trend of an ageing population in Powys UA is also seen when contrasting the 2001 and 2022 MYEs by single year of age (Figure 7). Growth can be seen in the older 50+ age group due to the natural ageing of the larger post-war 'baby boomer' cohorts, whilst decline can be seen in the younger age groups (0–15), linked to the steady fall in the number of births (see following section on the MYE Components of Change).
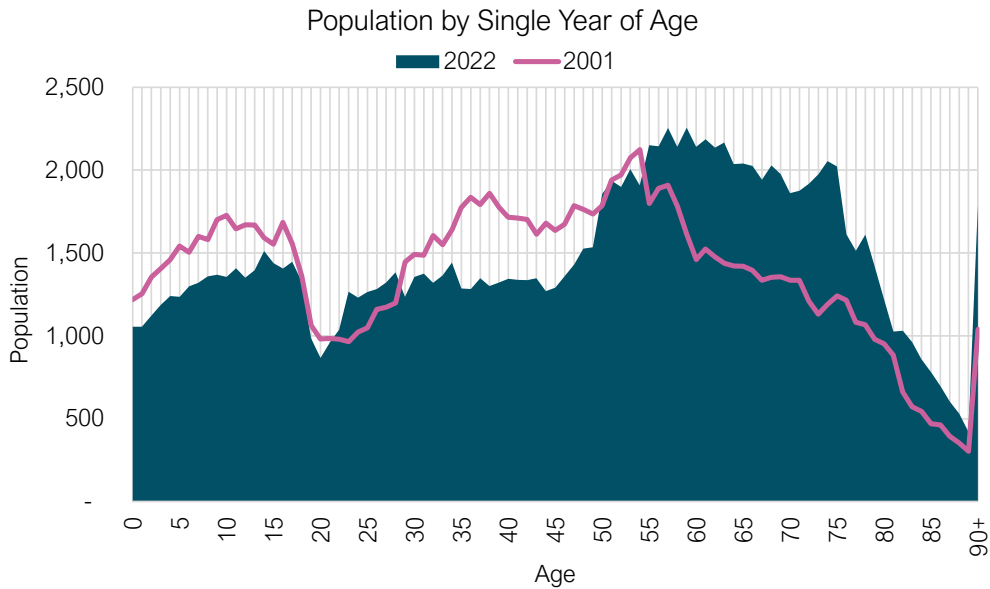


Figure 7: Powys UA population by single year of age (2001 and 2022)
Source: ONS

### MYE Components of Change

2.14    Figure 8 presents the MYE Components of Change from 2001/02–2021/22, illustrating the impact of natural change, internal migration, and international migration upon population change in Powys UA. Detailed commentary on the individual components for Powys UA is provided in the following sections.
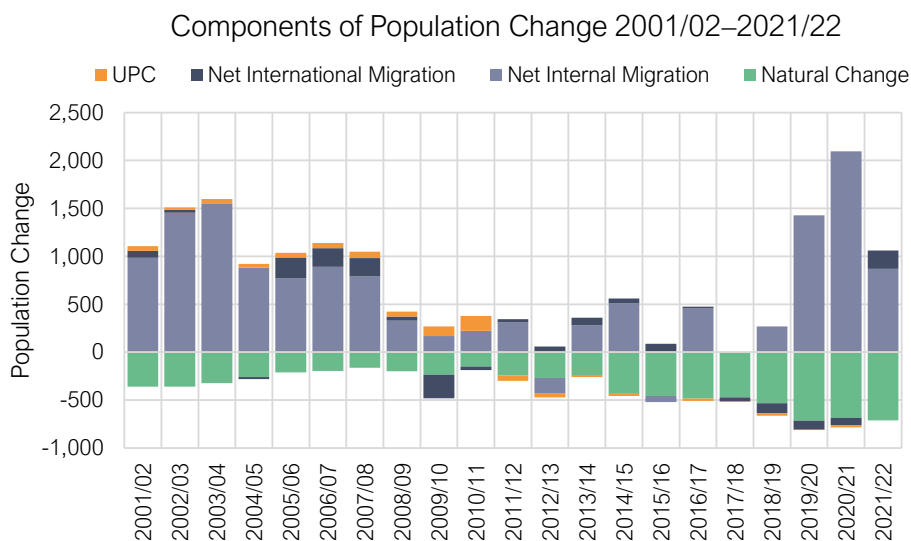


Figure 8: Powys UA components of population change (2001/02–2021/22)
Source: ONS

2.15    The components of change also include Unattributable Population Change (UPC), which relates to the rebasing of the MYEs to align with the 2011 and 2021 Census population counts. In the case of Powys UA, the 2011 Census was slightly *higher* than the intercensal MYE profile of growth had suggested (2002–2011), resulting in an upwards adjustment to the MYEs, reflected in the positive UPC. Conversely, the UPC associated with the 2021 Census was negative, reflecting a downwards adjustment to the MYEs (2012–2021), albeit relatively minor.

2.16    Although ONS has not assigned UPC to any one component of change, it is likely due to issues around the estimation of migration (specifically international migration), given that births and deaths are recorded in ONS Vital Statistics.

### *Natural Change*

2.17    Natural change (the balance between births and deaths) has been consistently negative in Powys UA between 2001/02 and 2021/22 (Figure 9), as the number of deaths registered in Powys UA has consistently exceeded the number of births. Deaths have averaged 1,539 per year since 2001/02, whilst births have averaged 1,173, resulting in an average natural change of -366 per year.

2.18    The number of births in Powys UA rose from 2001/02 to 2007/08, peaking at 1,271. Whilst the number of births fluctuated from 2007/08 to 2017/18, they have since gradually declined. This reflects national trends, with the Total Fertility Rate (TFR) across England and Wales reaching a record low of 1.58 in 2020.[5]

2.19    Contributing to the negative impact of natural change, the number of deaths in Powys UA has increased since 2010/11, peaking at 1,746 and 1,756 in 2009/20 and 2021/22, respectively. The increased number of deaths in 2019/20 may partially be attributed to the COVID-19 pandemic; the leading cause of deaths in England and Wales in 2020 and 2021.[6]
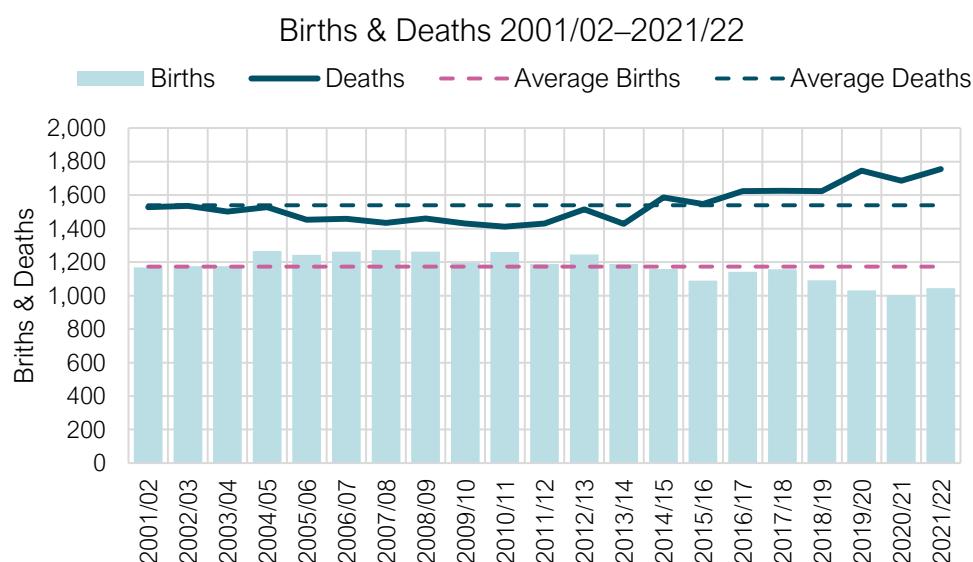


Figure 9: Powys UA births and deaths profile (2001/02–2021/22)
Source: ONS

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[5] ONS October 2021 Births in England and Wales: 2020
[6] ONS December 2023 Deaths registered in England and Wales: 2022

*Internal Migration*

2.20    According to the MYEs, net internal migration (domestic migration to and from elsewhere in the UK) has averaged +666 per year since 2001/02. In line with the distinct periods of population growth in Powys UA, net internal migration was highest in the period 2001/02 to 2007/08 and 2019/20 to 2021/22 (Figure 10), averaging +1,045 and +1,463, respectively. Between these two periods, net internal migration fluctuated, having a small impact upon population change (positive or negative).

2.21    In recent years, the increase in net internal migration is linked to both an increase in internal in-migration and a decrease in internal out-migration. This is likely to be associated with the COVID-19 pandemic, having an impact upon population mobility in 2019/20 and 2020/21, whilst also altering the dynamics between residential locations and workplaces, with a shift towards semi-urban and rural residential locations.[7]

2.22    In the following year, 2021/22, internal in- and out-migration flows declined, particularly in-migration, suggesting a return to pre-pandemic levels.
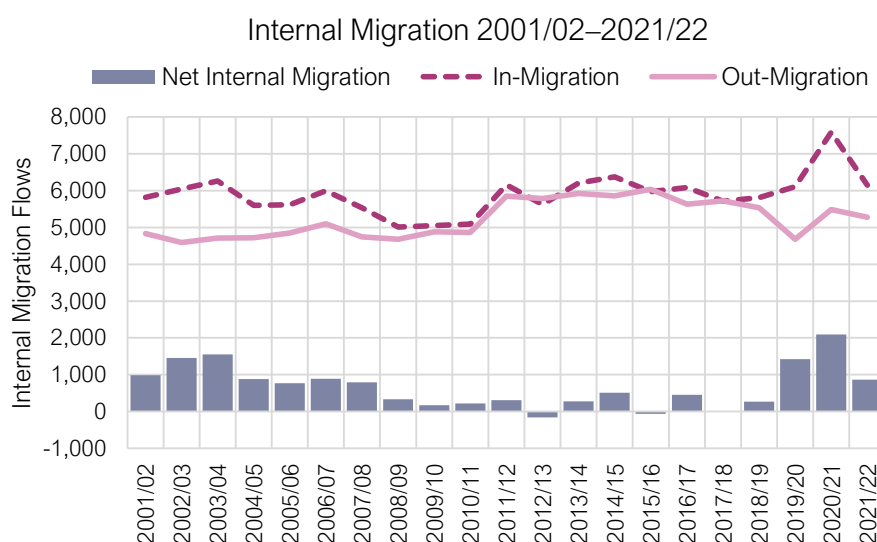


Figure 10: Powys UA internal migration (2001/02–2021/22)
Source: ONS

2.23    The ONS also publish data on the origin and destinations of internal migrants into and from Powys UA (Figure 11). The internal migration flow data highlights the strong relationship between Powys UA and the neighbouring English county, Shropshire, with the greatest in- and out-flows between the two counties over the period 2001/02–2021/22. On average, 633 people have moved from Shropshire to Powys UA each year, whilst 676 have moved from Powys UA to Shropshire, resulting in a net loss of people from Powys UA (-43 per year).

2.24    In terms of <u>net</u> flows, Powys UA's most significant net inflow has been from Birmingham, averaging +40 per year. The net outflow has been highest to Cardiff, averaging -55 per year.

2.25    Figure 11 also presents net migration flows by five-year age group, from 2001/02 to 2021/22. Powys UA has seen the largest net outflow in the 15–19 age group, averaging at -509 per year, likely to be

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[7] Gallent, N. et al. 2023 Pandemic mobility, second homes and housing market change in a rural amenity area during COVID-19 – The Brecon Beacons National Park, Wales

EDGE ANALYTICS

associated with young people moving to other areas to study. There is also a very small net outflow of those aged 25–29, averaging at -2 a year. For all other age groups, there was a net inflow. The age group with the largest net inflow was those aged 55–59.

## Powys: Internal Migration 2001/02–2021/22

| Top Ten Inflows | | Top Ten Outflows | |
|---|---|---|---|
| | *average 2001/02–2021/22* | | *average 2001/02–2021/22* |
| Shropshire | 633 | Shropshire | 676 |
| Herefordshire, County of | 325 | Herefordshire, County of | 309 |
| Cardiff | 207 | Cardiff | 262 |
| Neath Port Talbot | 206 | Ceredigion | 223 |
| Ceredigion | 187 | Neath Port Talbot | 191 |
| Monmouthshire | 135 | Swansea | 151 |
| Swansea | 134 | Carmarthenshire | 147 |
| Gwynedd | 132 | Monmouthshire | 128 |
| Carmarthenshire | 120 | Gwynedd | 127 |
| Birmingham | 112 | Telford and Wrekin | 94 |

### Top Ten Net Inflows

| Area | Average Net Migration 2001/02–2021/22 |
|---|---|
| Wiltshire | 12 |
| West Northamptonshire | 14 |
| Neath Port Talbot | 15 |
| Herefordshire, County of | 15 |
| Dudley | 19 |
| Sandwell | 19 |
| Wolverhampton | 21 |
| Walsall | 22 |
| Buckinghamshire | 26 |
| Birmingham | 40 |

### Top Ten Net Outflows

| Area | Average Net Migration 2001/02–2021/22 |
|---|---|
| Cardiff | -55 |
| Shropshire | -43 |
| Ceredigion | -37 |
| Carmarthenshire | -27 |
| Pembrokeshire | -20 |
| Swansea | -16 |
| Liverpool | -16 |
| Manchester | -14 |
| Bristol, City of | -11 |
| Scotland | -7 |

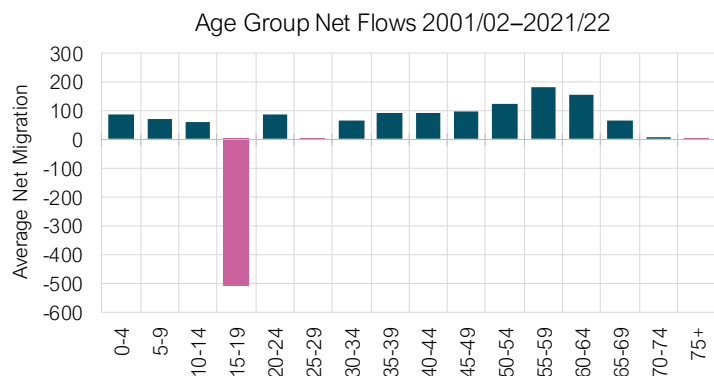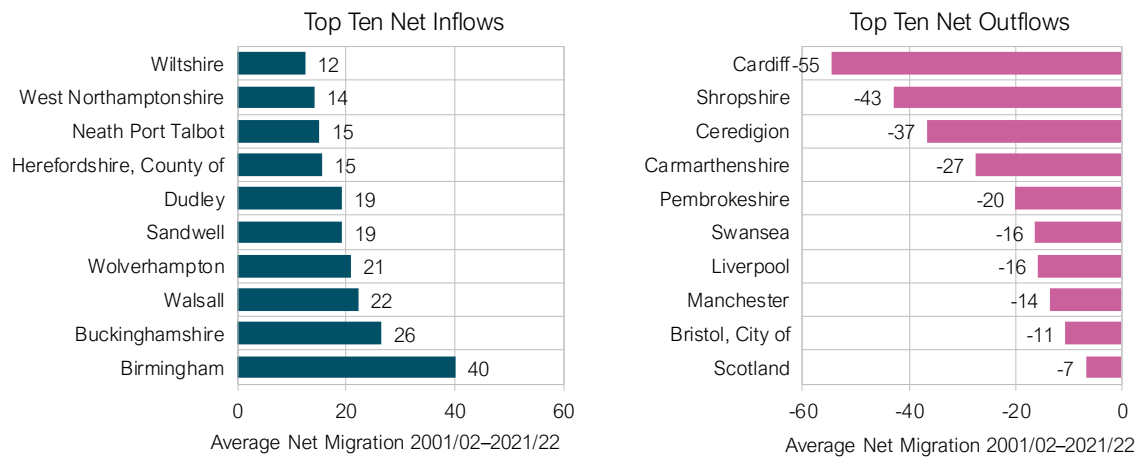### Age Group Net Flows 2001/02–2021/22

Figure 11: Powys UA internal migration flows (2001/02–2021/22)
Source: ONS

EDGEANALYTICS

## *International Migration*

2.26    International migration continues to be the most difficult component of change to estimate robustly, with ONS downgrading its estimates to 'experimental statistics' status whilst improvements continue.[8] Until 2020, the International Passenger Survey (IPS) provided the foundation of the UK's immigration and emigration estimates. However, in line with the ONS' move towards the use of administrative datasets, the rebased MYEs (2012–2021) and 2022 MYE used a mix of Home Office Borders and Immigration data, Department for Work and Pensions (DWP) benefits and earnings data, Higher Education Statistics Agency data, and IPS data, supplemented with the 2021 Census for British Nationals[2]. Given the changes to the estimation methodology, the rebased MYEs provide a valuable update on international migration to the UK.

2.27    In Powys UA, the MYEs suggest that net international migration (immigration from overseas and emigration to overseas) has had a varied impact upon population change since 2001/02 (Figure 12). Since 2001/02, net international migration has averaged +31 per year, rising to an average of +50 if the UPC adjustment is included within the net international migration estimate.

2.28    Reflecting national trends, net international migration was particularly high in 2021/22, due to an increase in immigration. Whilst it is challenging to dissect the cause of the increase in immigration at a UA-level, at a national level, the ONS has predominantly associated this increase with immigration from non-EU nationals, including arrivals via humanitarian routes (such as the Ukraine Sponsorship Scheme and Hong Kong British Nationals Overseas Welcome Programme) and the arrival of international students and their dependents, following the lifting of the COVID-19 travel restrictions.[9] For year ending June 2023 (not yet incorporated in the MYEs), the ONS also identified an increase in immigration for work reasons, specifically attributed to health and care visas.[10]
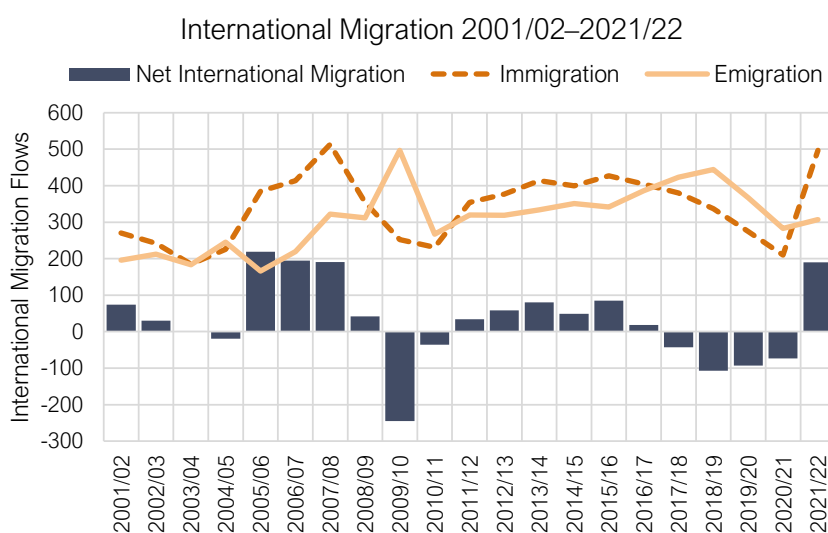


Figure 12: Powys UA international migration (2001/02–2021/22)
Source: ONS

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[8] ONS August 2019 Statement from the ONS on the reclassification of international migration statistics
[9] ONS May 2023 Long-term international migration, provisional: year ending December 2022
[10] ONS November 2023 Long-term international migration, provisional: year ending June 2023

2.29    National Insurance Number (NINo) registrations, published by DWP, provide a complementary illustration of international migration inflow to Powys UA. However, it is important to note that these statistics are different to the ONS MYE evidence in that they refer only to work-based in-migration, can include migrants whose stay may be shorter than 12 months and relate to the location at which a person registers.

2.30    Between 2002 and 2022, NINo registrations in Powys UA have predominantly been associated with migrants from countries that have joined the European Union (EU) since 2004 (EU13), peaking at 489 in 2007 (Figure 13). Total NINo registrations peaked in 2007, at 708, with smaller peaks in 2010 and 2016.

2.31    As a result of the COVID-19 pandemic and associated travel restrictions, there was a drop in the number of NINo registrations in 2020 and 2021. In addition, the drop in EU registrations in 2020 is linked to the end of free movement between the UK and EU.

2.32    The NINo registrations statistics also record an increase in 2022, in line with the ONS MYEs. Investigating the NINo registration data by country reveals that 41.5% of the NINo registrations in 2022 were associated with the arrival of Ukrainian nationals (included in the 'Other' category in the chart below).
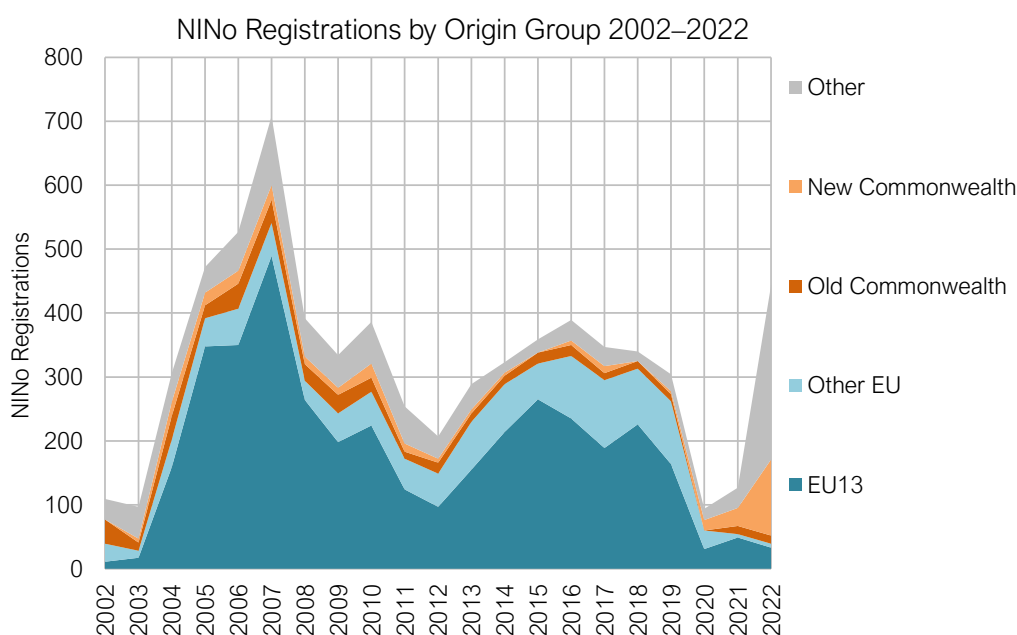


Figure 13: Powys UA NINo registrations by country-of-origin group (2002–2022)
Source: DWP
EU13 refers to countries who have joined the EU since 2004: Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, and Slovenia

# Households

## 2021 Census Headlines

2.33    At the 2021 Census, 98.9% of the usual resident population of Powys was estimated to be living in households (133,174 people), slightly higher than the proportion in Wales as a whole (98.2%). Across

Wales, 1.8% of the usual resident population lived in communal establishments at the 2021 Census; Powys has a slightly lower proportion of residents in communal establishments, at 1.1%. Communal establishments include residential care homes, mental health hospitals and secure units, student halls of residence, and some hostels/temporary shelters for the homeless.

2.34    There were a total of 60,182 households in Powys at the 2021 Census, with an average household size of 2.19, in line with the figure for Mid Wales but lower than the Wales figure of 2.27 (Figure 14). The number of households in Powys has increased by 3.1% since 2011, an increase of 1,837. This is lower than the rate of growth seen between the 2001 and 2011 Censuses, which was 8.3% (+4,480); aligning with the pattern of population growth during these two decades.
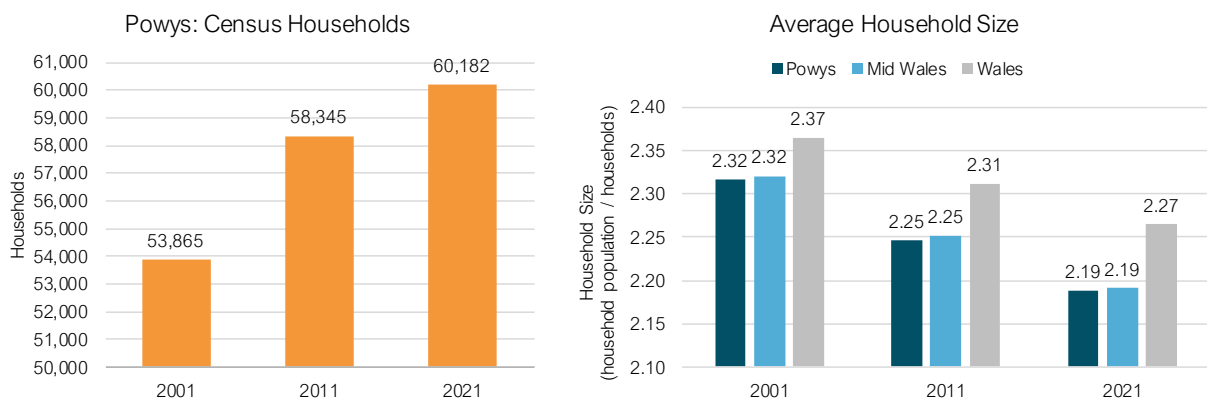


Figure 14: Powys UA: Census households and average household size (2001, 2011, and 2021)
Source: ONS

2.35    Average household size has consistently been lower in Powys compared to Wales, a reflection of the proportion of households with 1 people or 2 people (Figure 15) and ageing population profile.

2021 Census: Household Size
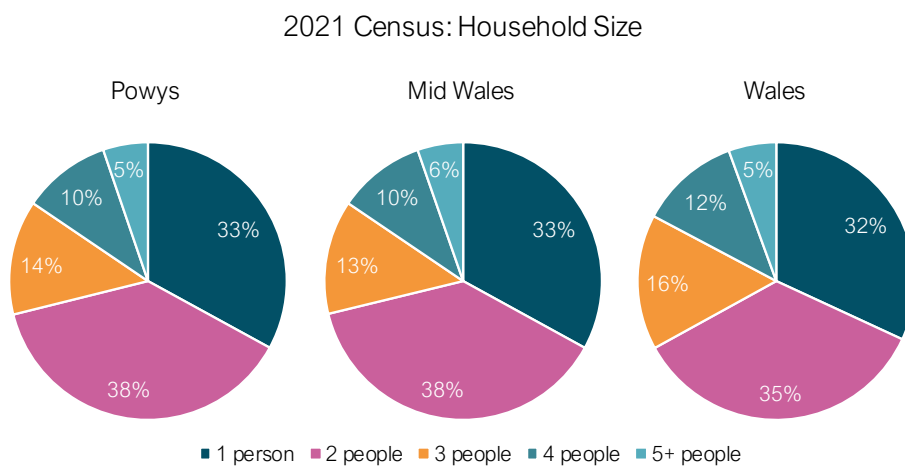


Figure 15: Powys UA: 2021 Census household size (2021)
Source: ONS

2.36    Compared to the Wales profile, Powys has a higher proportion of households in properties that are owned outright (47%) and a smaller proportion in properties that are owned with a mortgage, loan or

shared ownership (21%), social rented (14%), or private rented (18%) (Figure 16). The profile of household tenure for Powys aligns with that of Mid Wales as a whole.

**2021 Census: Household Tenure**
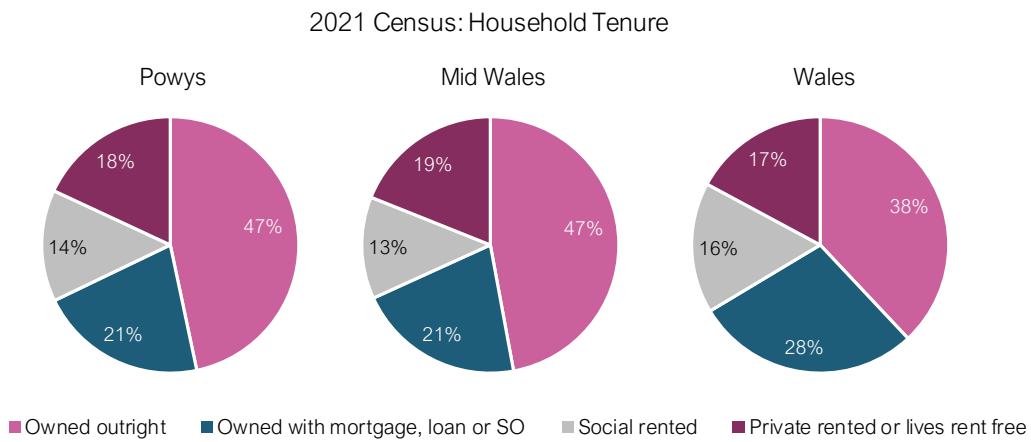


Figure 16: Powys UA: 2021 Census household tenure (2021)
Source: ONS

2.37    Reflecting the ageing population profile, Powys has a higher proportion of couples with no children (18%) compared to the Wales average (16%) and a higher proportion of households that are made up of one person aged 66+ (17%, compared to 15%) (Figure 17).

**2021 Census Household Composition**



Figure 17: Powys UA: 2021 Census household composition (2021)
Source: ONS

# Housing Growth

2.38    Powys' profile of annual population growth has been influenced by the rate at which new homes have been built. Information on historical total housing completions have been provided by Powys County Council for the period 2008/09–2022/23, relating to housing completions in Powys LPA only (i.e., excluding the area within BBNP).
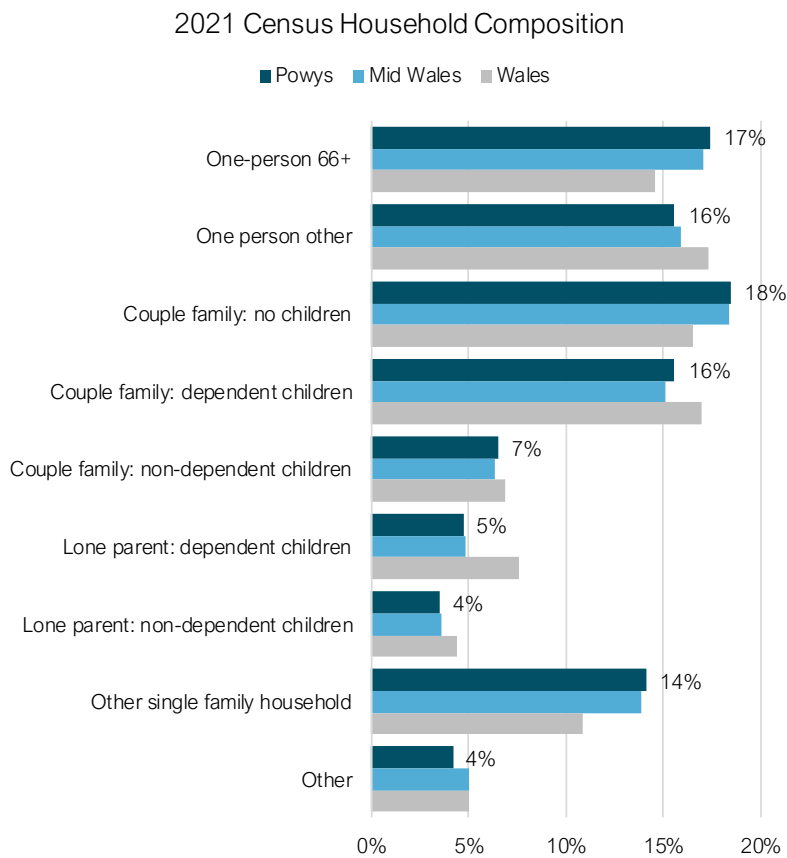
2.39    In Powys LPA, total housing completions suggest that there was an average of 238 completions per annum between 2008/09 and 2022/23 (Figure 18), reaching a low of 97 in 2011/12 and peaking at 369 in 2022.

2.40    The 3-year rolling average indicates that the rate at which housing has been completed has fluctuated historically, with two distinct periods of increased build rates, from 2013/14 to 2016/17 and from 2019/20 to 2022/23. The 3-year rolling average housing completions have peaked in recent years, reaching 341 in 2022/23.
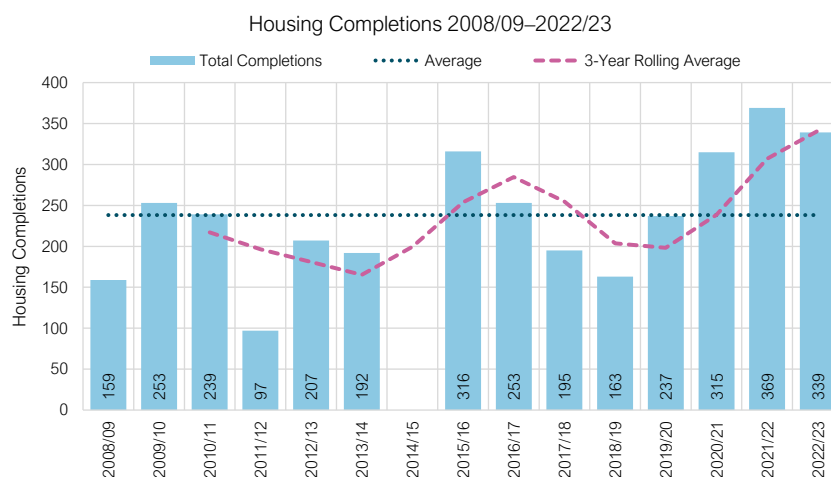


Figure 18: Powys LPA total housing completions (2008/09–2022/23)[11]
Source: Powys County Council

# Labour Force Characteristics

## Economic Activity

2.41    Economic activity rates are the proportion of the population that are actively engaged in the labour force, either employed or unemployed and looking for work. Figure 19 presents the economic activity rates for Powys UA by five-year age group (for ages 16–89), comparing the profiles from the 2011 and 2021 Censuses, for males and females.

2.42    Across all age groups, economic activity rates are higher for males than females in Powys UA, at the 2011 Census and the 2021 Census. Between 2011 and 2021, there has been a decrease in economic activity for males in all age groups under 55 years. For females, between 2011 and 2021, economic

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[11] In 2014/15, total housing completions were collated by the Council via an alternative method. To ensure historical comparability, housing completions for 2014/15 have been excluded from this chart.

activity rates have decreased in all ages under 55, with the exception of the 25–34 age group, in which economic activity has slightly increased. The increase in this age group is likely linked to more women in this age group being part of the workforce, reflected in reducing fertility rates.

2.43    The reduction in the 16–19 age group across males and females is linked to a greater proportion of this age group staying in education/training beyond the age of 16. In the 55+ age groups, economic activity rates increased between 2011 and 2021, particularly for women, due to increases in the State Pension age between 2010 and 2020.[12]
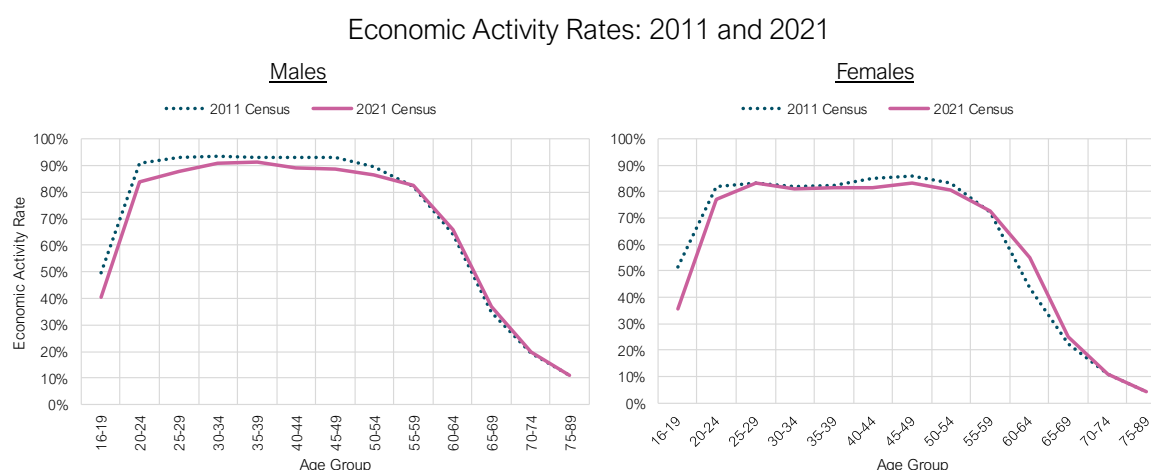
Economic Activity Rates: 2011 and 2021



Figure 19: Powys UA economic activity rates by age group and sex (2011 and 2021)
Source: ONS

2.44    It is likely that the COVID-19 pandemic has influenced the economic activity rates. The Office for Budget Responsibility (OBR) has identified that during the pandemic, there was a rise in economic inactivity, particularly amongst the student age groups.[13] This trend is also seen across the younger ages.[14] The latest OBR report suggests that this suppression in the participation rates is likely to continue until 2026 due to long-term sickness and retirement within the older age groups, but that rates may increase to 2029.[15]

2.45    Within the latest OBR fiscal outlook analysis, there is no forecast of the economic activity rates by age; the latest such analysis to include this is from 2018.[16] Within this report, the OBR published its long-term labour force forecasts, including estimated changes to age and sex-specific economic activity rates. These were informed by age and sex-specific population projections and historical economic activity rates, whilst also accounting for the rising state pension age and its impact upon the economic activity rates of older age groups. The OBR forecasts suggested that the increases seen between 2011 and 2021 would continue across all but the youngest age groups for females, and in the 35–54 age groups for males (Figure 30, 0). For the purposes of the demographic modelling presented in the next section, the OBR adjustments have been applied to the 2021 Census economic activity rates

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[12] Department for Work & Pensions 2023 State Pension Age Review 2023
[13] OBR July 2023 Fiscal risks and sustainability – July 2023
[14] IMF July 2023 The Recent Decline in United Kingdom Labor Force Participation: Causes and Potential Remedies
[15] OBR November 2023 Economic and fiscal outlook – November 2023
[16] OBR July 2018 Fiscal sustainability report – July 2018

from the 2021 base year, to reflect changes to the state pension age and potential improvements in participation rates over time.

## Unemployment

2.46    Unemployment rates measure the proportion of unemployed people within the resident labour force. Data from ONS indicates that since 2004, unemployment rates in Powys UA have been lower than the national average for Wales, trending closer towards national levels in the latest year of data (2022) (Figure 20). Whilst unemployment rates in Powys UA have remained below the national average, rates have reflected national trends, with an increase in unemployment during and following the 2008 recession (2007 to 2011), followed by a reduction in unemployment, reaching a low of 2.4% in 2018. Following the onset of the COVID-19 pandemic, unemployment rates increased to 2.9% and 3.6% in 2020 and 2021, respectively, with a small recovery in 2022 (at 2.8%).



Figure 20: Unemployment rate for Powys UA and Wales (YE December, 2004–2022)
Source: ONS model-based estimates of unemployment, APS, NOMIS

## Commuting

2.47    The difference between the level of employment in an area and the size of the resident workforce (i.e., residents in employment) can be used to infer a 'commuting ratio'. A ratio higher than 1.00 indicates a net *out*-commute (the number of resident workers exceeds the level of employment in the area). A commuting ratio lower than 1.00 indicates the reverse: a net *in*-commute (the level of employment in the area exceeds the size of the resident workforce). The closer the ratio is to 1.00, the greater the balance between the size of the resident workforce and the level of employment.

2.48    In the case of Powys UA, the 2011 Census recorded a commuting ratio of 1.06, indicating a net out-commute. It is challenging to produce a comparable commuting balance from the 2021 Census due to the questions asked and the timing of the Census during the COVID-19 pandemic, when many people were furloughed or were working from home. At the 2021 Census, an estimated 30.3% of

people aged 16+ in Powys UA who were in employment were working from home. This compares to 31.2% across England and Wales,[17] an increase from 10.3% in 2011.[18]

2.49    In the absence of an updated commuting ratio from the 2021 Census, evidence on commuting flows from the Annual Population Survey (APS), published by WG, provide a valuable update to the 2011 Census statistics. Figure 21 presents the commuting ratio for Powys UA for the period 2004–2022, derived by comparing statistics on the total number of working residents in the area (i.e., the resident workforce) and the total number of people working in the area (i.e., employment). For Powys UA, the commuting ratio has steadily decreased from its peak of 1.16 in 2009, to 1.01 in 2022. This indicates a significant reduction in the net out-commute. For the purposes of the demographic modelling in the next section, the APS WG commuting ratios have been applied.
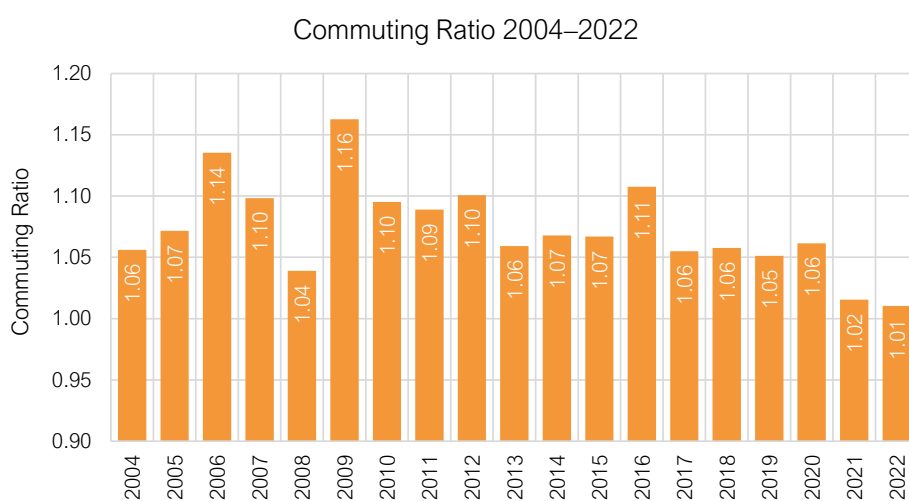
Commuting Ratio 2004–2022



Figure 21: Powys UA commuting ratio (2004–2022)
Source: APS, WG

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[17] ONS December 2022 Travel to work, England and Wales: Census 2021
[18] ONS December 2022 Understanding commuting patterns from Census 2021

# 3   DEMOGRAPHIC SCENARIOS

## Introduction

3.1     A range of demographic growth scenarios have been configured for Powys UA (i.e., including the area within BBNP) and Powys LPA (i.e., excluding the area within BBNP) (Table 1). These scenarios have been developed using POPGROUP demographic forecasting technology and the latest demographic statistics, including statistics from the 2021 Census and the ONS' rebased MYEs.

3.2     The scenarios produce a range of population, household, dwelling, labour force and employment growth outcomes, which are presented in this section firstly for Powys UA, followed by the population, household, dwelling, and employment growth outcomes for Powys LPA.

3.3     Appendix A contains detail on the POPGROUP methodology and the data inputs and assumptions used in the forecast development.

## Scenario Definition

### Scenario Overview

#### *Powys UA*

3.4     In total, 9 scenarios have been configured for Powys UA, including WG and alternative trend scenarios. All scenarios have a 2037 forecast horizon.

3.5     The **WG** scenarios refer to the latest official projections from WG, including the 2018-based Principal projection, plus the full suite of variants that make up the 2018-based projections. This includes the High, Low, 10-year Migration, 15-year Migration and the Zero Migration variants, published by WG in August 2020 and August 2021. These official projections have a 2018 base year and are based upon the 'previous' MYEs (i.e., not the ONS' rebased MYEs).

3.6     Using the rebased and latest MYEs (to 2022), three 'alternative trend' scenarios have been developed, using different migration histories from which to calibrate future growth assumptions. These '**PG**' scenarios are based on a continuation of short-term (5-year), 10-year, and long-term (21-year) migration histories. In all scenarios, the UPC adjustment is included within the historical international migration profile. The **PG** scenarios have a 2022 MYE base year.

#### *Powys LPA*

3.7     For Powys LPA, the **WG** and **PG** scenarios have been replicated, with two '**Dwelling-led**' scenarios and an '**Employment-led**' scenario also configured (12 scenarios in total). The scenarios for Powys LPA have a consistent forecast horizon of 2037.

3.8     To evaluate the population impact of potential levels of future housing growth, two **Dwelling-led** scenarios have been generated for Powys LPA. In a **Dwelling-led** scenario, population growth is linked to the annual growth in the number of dwellings, which in this case is linked to a 5-year and 10-year

EDGE ANALYTICS

history of housing completions in Powys LPA.[19] The relationship between dwelling growth and population growth is determined by three key assumptions: a household to dwelling conversion factor, communal population assumptions (accounting for the population not living in households, e.g., those living in student halls of residence or residential care homes), and household membership rates (see below and Appendix A for detail on these assumptions). Internal migration is used to balance between population and dwelling growth; if the resident population is insufficient in size and structure to populate the additional dwellings, a higher level of net in-migration and consequently population growth will result.

3.9     Drawing on the economic forecasts produced by Oxford Economics, an **Employment-led** scenario has been generated for Powys LPA. In an **Employment-led** scenario, the annual change in employment is used to derive a labour force and population growth profile, using key assumptions relating to economic activity rates, unemployment and commuting (see below and Appendix A for detail on these assumptions). As defined in the Oxford Economics forecast, the annual employment growth applied for Powys LPA averages +11 per year over the forecast period (2022–2037).

## Household & Dwelling Assumptions

3.10    In all scenarios, household and dwelling growth have been estimated using household membership rate assumptions from the WG's 2018-based household projection model for Powys UA, and a household to dwelling conversion factor of 0.9, drawn from the 2021 Census data (implying a dwelling 'vacancy' rate of 10%).[20]

## Employment Assumptions

3.11    In each scenario, the relationship between the population and the labour force is determined by the economic activity rates. Defined by age group and sex, the economic activity rates determine the size of the resident labour force (which includes both people in employment and those that are unemployed). Economic activity rates have been drawn from the 2021 Census for Powys UA. Whilst these rates are lower than the earlier 2011 Census rates, it is considered preferable to use these as the rates take account of changes to the school leavers age, increased participation amongst young women, and the potential ongoing impact of the COVID-19 pandemic on long-term sickness. Adjustments have been applied to the 2021 Census economic activity rates using the OBR 2018 forecasts, taking account of adjustments to long-term economic participation rates, including future changes to the state pension age.

3.12    In all scenarios, the same commuting and unemployment assumptions have been applied, fixed throughout the forecast period. Drawn from the APS, published by WG, a commuting ratio of 1.01 has been applied, indicating a net out-commute from Powys UA. This commuting ratio is used to determine the balance between residents in employment and the level of employment in Powys UA. An unemployment rate of 3.1% has been applied (derived from the latest ONS model-based estimates of unemployment for mid-year 2023).[21]

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[19] Housing completions for Powys LPA have been provided by the Council.
[20] For Powys LPA, membership rate assumptions for Powys UA have been applied, in the absence of sub-UA statistics. Derived using 2021 Census data, a household to dwelling conversion factor for Powys LPA has been applied (0.9).
[21] For Powys LPA, the economic activity rates, commuting ratio, and unemployment rate for Powys UA have been applied, in the absence of sub-UA statistics.

EDGE ANALYTICS

Table 1: Scenario definitions

| | |
|---|---|
| WG-2018 | Replicates the WG 2018-based *principal* projection, using historical population evidence up to its 2018 base year, and drawing migration assumptions from a 5-year period. |
| WG-2018-High | Replicates the WG 2018-based *high* projection, using historical population evidence up to its 2018 base year, and incorporating high fertility, mortality, and migration assumptions. |
| WG-2018-Low | Replicates the WG 2018-based *low* projection, using historical population evidence up to its 2018 base year, and incorporating low fertility, mortality, and migration assumptions. |
| WG-2018-10YR Mig | Replicates the WG 2018-based *10-year migration* projection, using historical population evidence up to its 2018 base year, and drawing migration assumptions from a 10-year period. |
| WG-2018-15YR Mig | Replicates the WG 2018-based *15-year migration* projection, using historical population evidence up to its 2018 base year, and drawing migration assumptions from a 15-year period. |
| WG-2018-Zero Mig | Replicates the WG 2018-based *zero migration* projection, using historical population evidence up to its 2018 base year, and assuming zero migration throughout the projection (i.e., only natural change (births minus deaths) contributes to population change). |
| PG-Short Term | Uses a 2022 base year, with migration assumptions calibrated from a 5-year historical period (2017/18–2021/22), including the UPC adjustment in the international migration component of the MYEs (2001/02–2020/21). |
| PG-10YR | Uses a 2022 base year, with migration assumptions calibrated from a 10-year historical period (2011/12–2021/22), including the UPC adjustment in the international migration component of the MYEs (2001/02–2020/21). |
| PG-Long Term | Uses a 2022 base year, with migration assumptions calibrated from a 21-year historical period (2001/02–2021/22), including the UPC adjustment in the international migration component of the MYEs (2001/02–2020/21). |
| Dwelling-led 5YR | Models the population growth impact of average annual dwelling growth of +285 dpa in Powys LPA, based on a 5-year history of housing completions in (2018/19–2022/23). This scenario has been configured for Powys LPA only. |
| Dwelling-led 10YR | Models the population growth impact of average annual dwelling growth of +259 dpa in Powys LPA, based on a 10-year history of housing completions in (2012/13–2022/23).[22] This scenario has been configured for Powys LPA only. |
| Employment-led OE | Models the population growth impact of average annual employment growth of +11 per year for Powys LPA, as detailed in the Oxford Economics forecast for Powys LPA. This scenario has been configured for Powys LPA only. |

[22] Due to the Council's alternative reporting method for 2014/15, housing completions for 2014/15 have been excluded from the 10-year average.

EDGEANALYTICS

# Powys UA Scenario Outcomes

## Scenario Summary

3.13    For Powys UA, the population growth trajectories for each scenario for 2001–2037 are summarised in Figure 22, with the scenario growth outcomes for the 2022–2037 period summarised in Table 2.
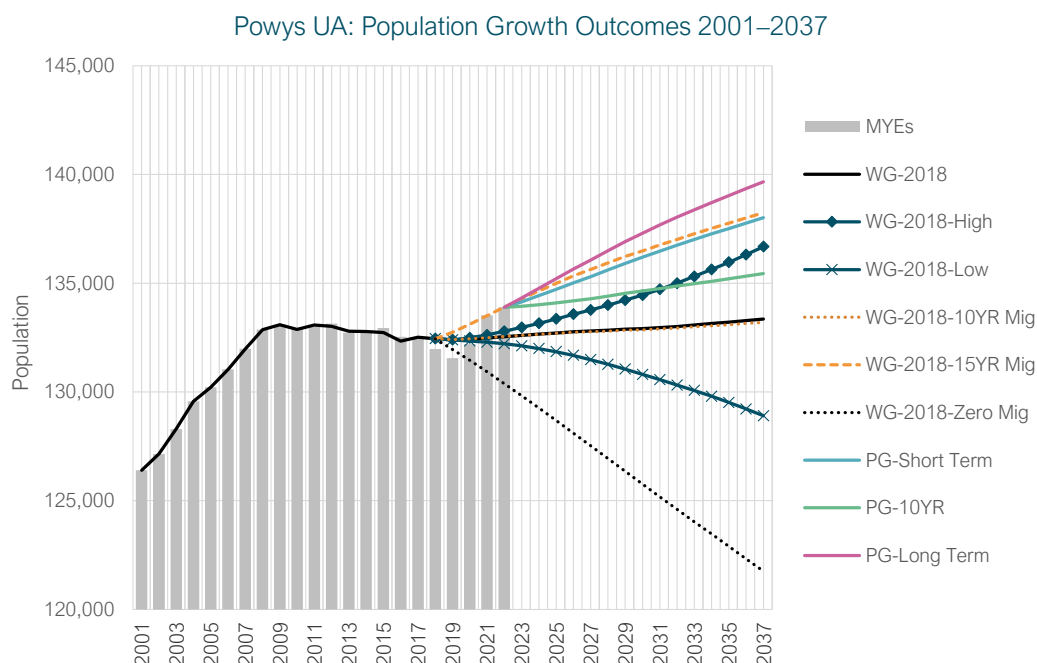


Figure 22: Powys UA population growth outcomes (2001–2037)

Table 2: Powys UA scenario summary (2022–2037)

| Scenario | Change 2022 - 2037 | | | | Average per year | |
|---|---|---|---|---|---|---|
| | Population Change | Population Change % | Households Change | Households Change % | Net Migration | Dwellings |
| PG-Long Term | 5,769 | 4.3% | 3,749 | 6.1% | 1,197 | 278 |
| WG-2018-15YR Mig | 4,330 | 3.2% | 3,156 | 5.1% | 1,050 | 234 |
| PG-Short Term | 4,120 | 3.1% | 3,351 | 5.5% | 1,099 | 248 |
| WG-2018-High | 3,889 | 2.9% | 2,887 | 4.7% | 885 | 214 |
| PG-10YR | 1,554 | 1.2% | 2,080 | 3.4% | 922 | 154 |
| WG-2018 | 816 | 0.6% | 1,644 | 2.7% | 807 | 122 |
| WG-2018-10YR Mig | 649 | 0.5% | 1,462 | 2.4% | 794 | 108 |
| WG-2018-Low | -3,308 | -2.5% | 88 | 0.1% | 728 | 7 |
| WG-2018-Zero Mig | -8,618 | -6.6% | -3,855 | -6.5% | 0 | -286 |

Note: Under the **WG-2018-Zero Mig** scenario, a net 'loss' in dwellings is suggested by the model (-286 dpa). In reality, this suggests that no additional dwelling growth is required under this scenario outcome.

3.14    For the 2022–2037 period, population change ranges from 4.3% under the **PG-Long Term** scenario to -6.6% under the **WG-2018-Zero Mig** scenario. This range of population growth outcomes equates to estimated dwelling change of 278 and -286 dwellings per annum (dpa).

3.15    The **WG-2018** scenario, replicating the WG's 2018-based Principal projection for Powys UA, provides a mid-range population growth outcome, at 0.6%, with an associated dwelling growth outcome of 122 dpa. Under the **WG-2018** scenario, net internal migration is expected to be the key driver of population growth, bolstered by net international migration (Figure 23). Together, average net migration of 807 per year is estimated over the forecast period. Whilst the impact of net migration results in population growth, this is dampened by the negative impact of natural change.
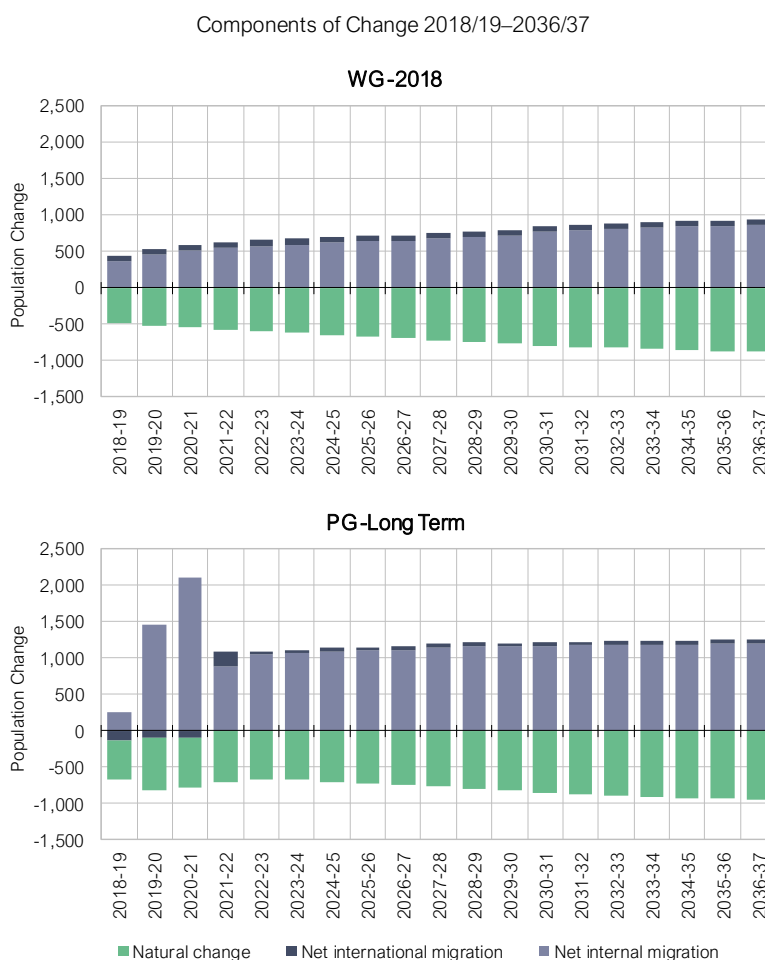


Figure 23: Powys UA **WG-2018** and **PG-Long Term** scenarios, components of change (2018/19–2036/37)[23]

3.16    Reflecting the inclusion of high fertility, mortality, and migration assumptions, the **WG-2018-High** scenario estimates a higher level of population and dwelling growth compared to the **WG-2018** scenario, at 2.9% and 214 dpa. In contrast, the **WG-2018-Low** scenario, including low fertility, mortality, and migration assumptions, estimates population decline of -2.5%, with a dwelling growth outcome of 7 dpa.

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[23] For comparability across the scenarios, the components are presented from 2018/19 onwards (i.e., from the base year of the **WG-2018** scenario).

3.17    The **WG-2018-10YR Mig** and **WG-2018-15YR Mig** scenarios also use a 2018 base year, however, use alternative migration histories to the **WG-2018** scenario, using a 10-year and 15-year history, respectively. Reflecting the high levels of internal migration up to 2007/08 (Figure 8), the **WG-2018-15YR Mig** scenario provides the highest population growth outcome of the WG 2018-based projections, at 3.2%, with an associated dwelling growth outcome of 234 dpa. The **WG-2018-10YR Mig** scenario estimates population growth of 0.5% and dwelling growth of 108 dpa, similar to the **WG-2018** scenario.

3.18    Assuming zero migration over the forecast period, the **WG-2018-Zero Mig** scenario results in population decline of -6.6% and suggests that no additional dwelling growth is required. Whilst this scenario is theoretical, it illustrates the significant impact of natural change upon population change in Powys UA, resulting in a net loss of population.

3.19    Using the MYE evidence up to 2022 and with migration assumptions drawn from alternative historical time periods, the **PG-Short Term**, **PG-10YR** and **PG-Long Term** scenarios produce population growth outcomes that are higher than the WG 2018-based Principal projection (**WG-2018**). In all **PG** scenarios, a net loss of population through natural change is estimated, a reflection of Powys UA's ageing population, with population growth estimated to be driven by net internal migration (Figure 4). Reflecting the migration trends over their respective historical time periods, population growth is estimated to be highest under the **PG-Long Term** scenario (4.3%) and lowest under the **PG-10YR** scenario (1.2%), with an associated dwelling growth range of 278 dpa to 154 dpa, respectively.

## Age Profiles

3.20    To inform the planning for housing and employment, the changing age structure of the population is an important consideration, with each scenario resulting in a different population age structure. Figure 24 presents the population change by age group under the WG 2018-based Principal projection (**WG-2018**) and the **PG-Long Term** scenario, the highest population growth outcome of the scenarios.

3.21    Under both scenarios, significant growth is estimated in the 65+ age groups, a reflection of the ageing population in Powys UA. The **WG-2018** scenario estimates population decline in all groups from 0–39 and 50–64, with the greatest decline estimated in ages 55–59. With the exception of the 0–4, 20–24, and 35–39 age groups, the **PG-Long Term** scenario also estimates population decline in these age groups, albeit to a lesser extent. Both scenarios estimate population growth in the 40–49 age groups.
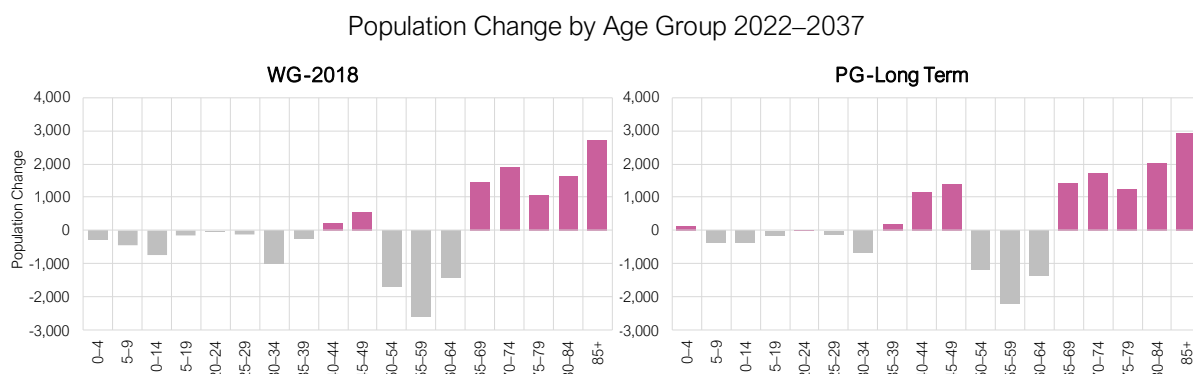
Population Change by Age Group 2022–2037



Figure 24: Powys UA **WG-2018** and **PG-Long Term** population change by age group (2022–2037)

## Linking Population and Employment

3.22    Under each scenario, the size of the labour force and the level of employment growth that could be supported has been derived through the application of economic activity rates, an unemployment rate, and a commuting ratio. For the period 2022–2037, Figure 25 presents the average annual employment change under each scenario.

3.23    The **PG-Long Term** scenario provides the highest employment growth outcome of the scenarios, at 172 per year. This reflects the growth in the size of the labour force that is estimated under this scenario, with growth of 2,821 people estimated over the forecast period. Due to the estimated reduction in the size of the labour force (-216 people) and the ageing population profile, the **WG-2018** scenario suggests a reduction in the level of employment that could be supported, at -22 per year. The **WG-2018-Zero Mig** scenario, illustrating the impact of natural change upon population growth in isolation, results in a significant decline in the size of the labour force over the forecast period, at -5,211 people, with an associated reduction in the level of employment that could be supported (-341 per year).
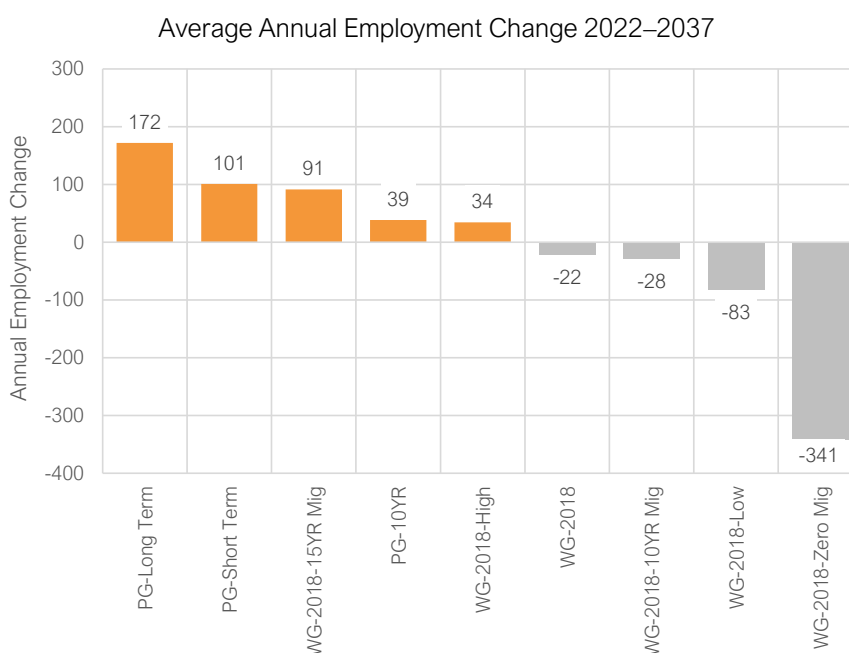


Figure 25: Powys UA average annual employment change (2022–2037)

# Powys LPA Scenario Outcomes

## Scenario Summary

3.24    Figure 26 presents the population growth trajectories for Powys LPA under each scenario for 2001–2037, with the scenario growth outcomes summarised in Table 3 for the period 2022–2037.

3.25    For Powys LPA, population growth ranges from 6.5% under the **Dwelling-led 5YR** scenario to -7.4% under the **WG-2018-Zero Mig** scenario, with an associated dwelling growth range of 288 dpa to -265 and average employment range of 182 to -297 per year, respectively.

## Powys LPA: Population Growth Outcomes 2001–2037



Figure 26: Powys LPA population growth outcomes (2001–2037)

Table 3: Powys LPA scenario summary (2022–2037)

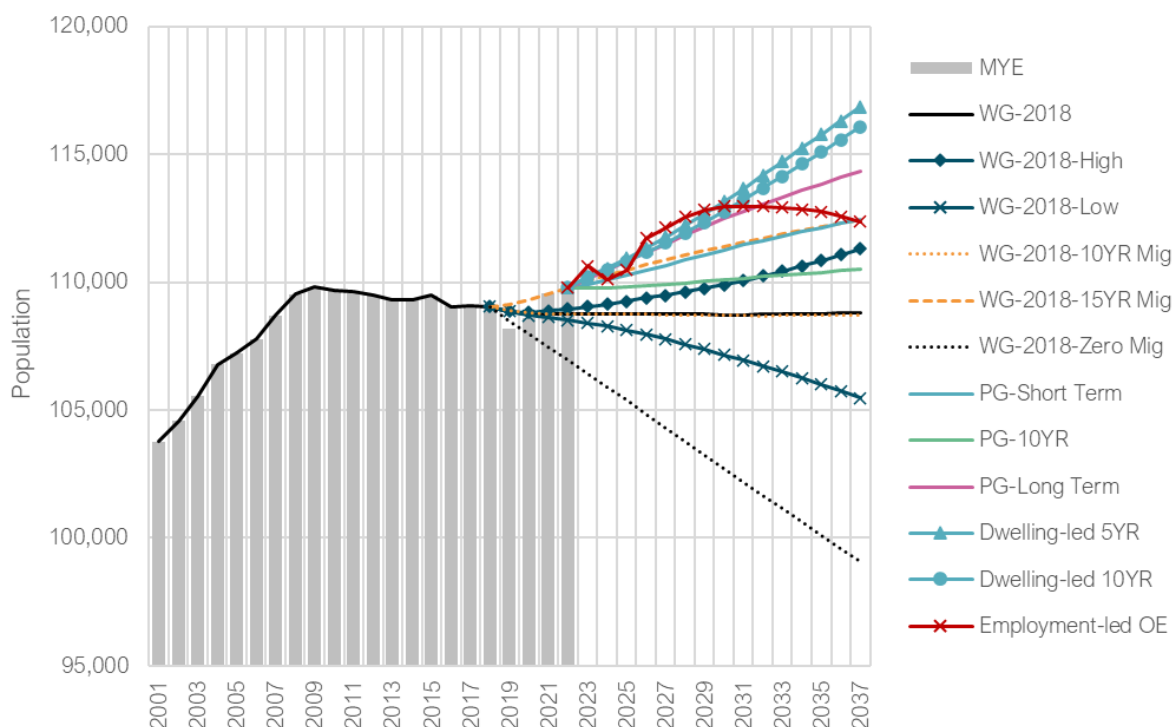| Scenario | Change 2022 - 2037 | | | | Average Dwellings per year | Average Employment per year |
|---|---|---|---|---|---|---|
| | Population Change | Population Change % | Households Change | Households Change % | | |
| Dwelling-led 5YR | 7,096 | 6.5% | 3,906 | 7.8% | 288 | 182 |
| Dwelling-led 10YR | 6,297 | 5.7% | 3,578 | 7.1% | 264 | 153 |
| PG-Long Term | 4,567 | 4.2% | 2,986 | 5.9% | 220 | 131 |
| PG-Short Term | 2,675 | 2.4% | 2,335 | 4.6% | 172 | 61 |
| WG-2018-15YR Mig | 2,659 | 2.4% | 2,120 | 4.2% | 156 | 50 |
| Employment-led OE | 2,597 | 2.4% | 2,041 | 4.1% | 151 | 11 |
| WG-2018-High | 2,346 | 2.2% | 1,931 | 3.9% | 142 | 9 |
| PG-10YR | 746 | 0.7% | 1,366 | 2.7% | 101 | 15 |
| WG-2018 | 34 | 0.0% | 991 | 2.0% | 73 | -34 |
| WG-2018-10YR Mig | -72 | -0.1% | 854 | 1.7% | 63 | -38 |
| WG-2018-Low | -3,044 | -2.8% | -179 | -0.4% | -13 | -80 |
| WG-2018-Zero Mig | -7,862 | -7.4% | -3,591 | -7.3% | -265 | -297 |

Note: Under the **Dwelling-led 5YR** and **Dwelling-led 10YR** scenarios, dwelling completions for 2022-23 are included.

3.26    In line with the growth outcomes for Powys UA, the **WG-2018** scenario is towards the lower end of the growth range for Powys LPA, with minimal population growth estimated over the forecast period (+34 people, equivalent to 0.0%). Compared to the **WG-2018** scenario, the **WG-2018-15YR Mig** and **WG-2018-High** scenarios estimate higher population growth (at 2.4% and 2.2%, respectively), with the **WG-2018-10YR Mig**, **WG-2018-Low**, and **WG-2018-Zero Mig** scenarios estimating lower population growth (at -0.1%, -2.8%, and -7.4%, respectively), a reflection of the fertility, mortality, and migration assumptions incorporated into each of the variant projections (Table 1).

3.27    Using migration assumptions based on a short-term and long-term historical time period, the **PG-Short Term** and **PG-Long Term** scenarios estimate population growth that is higher than the **WG-2018** scenario, at 2.4% and 4.2% respectively, with associated dwelling growth of 172 dpa and 220 dpa and average employment growth of 61 and 131 per year. Aligning with the scenario growth outcomes for Powys UA, the **PG-10YR** scenario estimates lower population, dwelling, and employment growth for Powys LPA, at 0.7%, 101 dpa and average employment of 15 per year.

3.28    The **Employment-led OE** scenario, modelling the impact of average annual employment of +11 per year (based on the Oxford Economics forecast), provides a population growth outcome of 2.4% over the period 2022–2037, with an associated dwelling growth outcome of 151 dpa. Whilst these scenario outcomes are similar to the **WG-2018-15YR Mig** scenario, this scenario also suggests that average annual employment of +11 would result in population and dwelling growth that is lower than short-term and long-term trends imply (**PG-Short Term** and **PG-Long Term**).

3.29    Both the **Dwelling-led 5YR** and **Dwelling-led 10YR** scenarios result in higher levels of population and employment growth than any other scenarios, estimating population growth of 6.5% and 5.7% and corresponding average employment growth of 182  and 153 per year, respectively. The **Dwelling-led** scenarios result in higher levels of population growth than the short-term, 10-year, and long-term trends imply (**PG-Short Term**, **PG-10YR**, and **PG-Long Term**). In this type of scenario, it is the household membership rates that determine the number of households implied by the defined level of dwelling growth and, by extension, the resulting level of population growth. It is important to note that if rates of household formation were to increase, for example as a result of improved affordability, then a greater proportion of residents in Powys LPA would form households. This would reduce the 'need' for population growth to support the higher levels of dwelling growth.

## Scenario Summary & Conclusions

3.30    Powys County Council is in the process of preparing a RLDP, setting out the Council's development proposals for the period 2022–2037. To inform this process, the Council sought the latest demographic evidence for Powys, including a suite of demographic growth scenarios.

3.31    Using POPGROUP forecasting technology together with the latest demographic statistics, a range of demographic growth scenarios have been produced for Powys UA and Powys LPA, for the period 2022–2037. For both Powys UA and Powys LPA, this has produced a range of population, household, dwelling and employment growth outcomes, benchmarked against the latest official projection from the WG (**WG-2018**). Under each scenario, the dwelling growth outcomes for Powys UA and Powys LPA are summarised in Figure 27.

3.32    It is important to note that the scenarios include a range of assumptions which, if varied, would result in alternative scenario outcomes (e.g., the household membership rates, the household to dwelling conversion factor, economic activity rates, commuting ratio, unemployment rate).
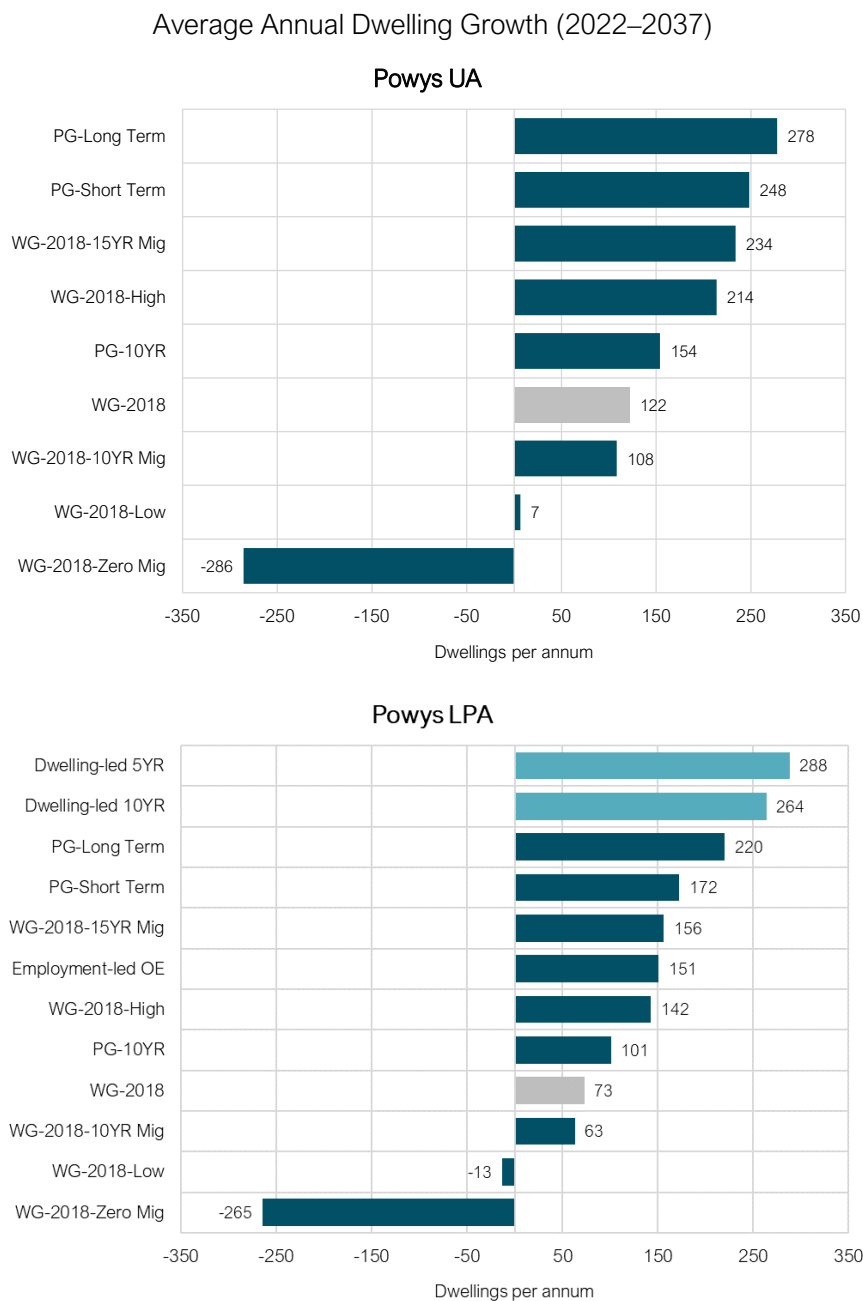
## Average Annual Dwelling Growth (2022–2037)

### Powys UA

| Scenario | Dwellings per annum |
|---|---|
| PG-Long Term | 278 |
| PG-Short Term | 248 |
| WG-2018-15YR Mig | 234 |
| WG-2018-High | 214 |
| PG-10YR | 154 |
| WG-2018 | 122 |
| WG-2018-10YR Mig | 108 |
| WG-2018-Low | 7 |
| WG-2018-Zero Mig | -286 |

### Powys LPA

| Scenario | Dwellings per annum |
|---|---|
| Dwelling-led 5YR | 288 |
| Dwelling-led 10YR | 264 |
| PG-Long Term | 220 |
| PG-Short Term | 172 |
| WG-2018-15YR Mig | 156 |
| Employment-led OE | 151 |
| WG-2018-High | 142 |
| PG-10YR | 101 |
| WG-2018 | 73 |
| WG-2018-10YR Mig | 63 |
| WG-2018-Low | -13 |
| WG-2018-Zero Mig | -265 |

Figure 27: Powys UA & Powys LPA average annual dwelling growth (2022–2037)

# Appendix A
# POPGROUP METHODOLOGY

## POPGROUP

A.1  POPGROUP is a suite of demographic models used to derive forecasts of population, households, and labour force, for areas and social groups. The main POPGROUP model (Figure 28) is a 'cohort component' model, which enables the development of population forecasts based on births, deaths and migration inputs and assumptions.
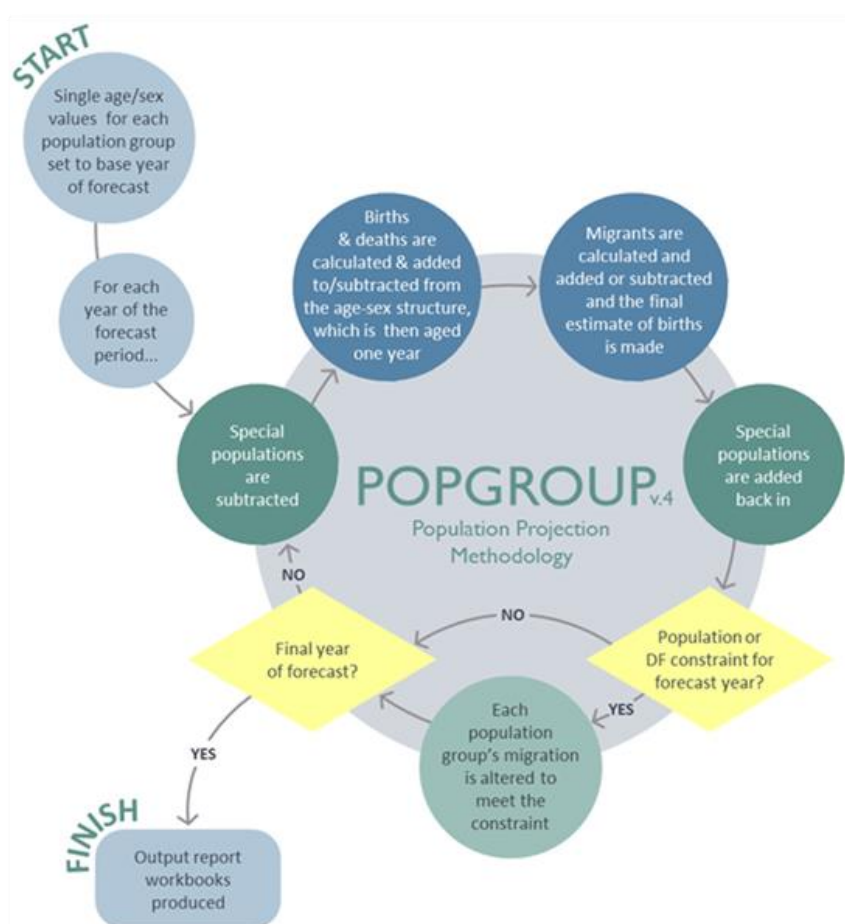


Figure 28: POPGROUP Population Projection Methodology

A.2  The Derived Forecast (DF) model sits alongside the population model (Figure 29) providing a membership rate model for household and dwelling projections and an economic activity rate model for labour force and employment projections.
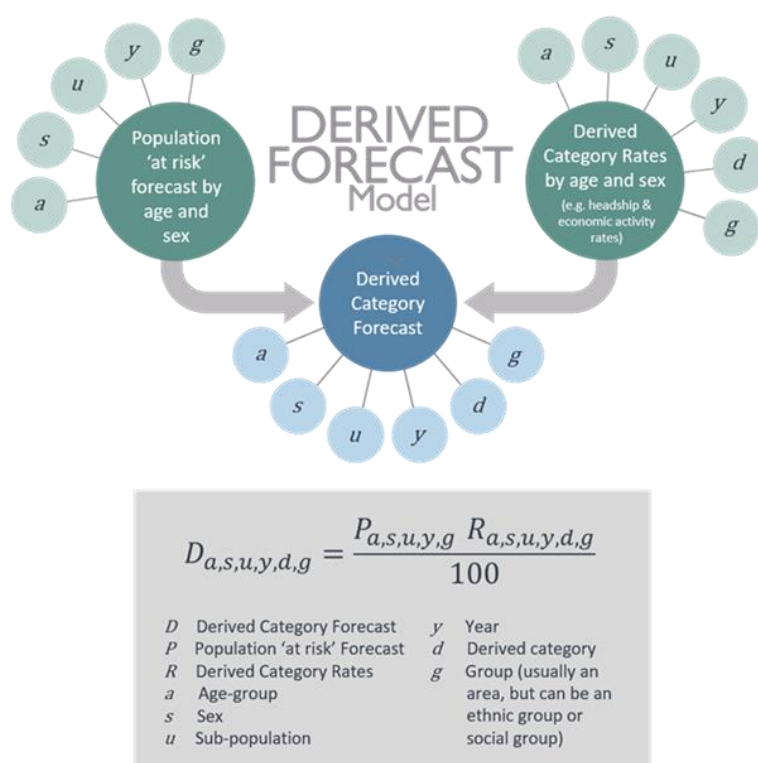
Figure 29: Derived forecast (DF) methodology

# Scenario Inputs & Assumptions

## Population

A.3    In each of the **PG**, **Dwelling-led** and **Employment-led** scenarios, historical population statistics are provided up to and including 2022 by the ONS MYEs, with all data disaggregated by single year of age and sex. From the 2022 base year onwards, future population counts are estimated by single year of age and sex, using the defined assumptions on fertility, mortality, and migration.

A.4    In the **WG** scenarios, the MYEs are defined up to the projection's 2018 base year. From 2018 onwards, the population growth is as defined in the official projections.

### *Births & Fertility*

A.5    Historical mid-year to mid-year counts of births by sex have been sourced from the ONS MYEs.

A.6    In the **WG** scenarios, historical counts of births have been used until the 2018 base year. The future counts of births are reproduced from the base year onwards to ensure consistency with the official projections.

A.7    For the **PG**, **Dwelling-led**, and **Employment-led** scenarios, birth counts are applied from 2001/02 to 2021/22. From 2022/23, an area-specific and age-specific fertility rate (ASFR) schedule is derived from a 5-year history of historical births data (2017/18–2021/22). In combination with the 'population at risk' (i.e., all women between the age of 15–49), these ASFR assumptions provide the basis for the

calculation of births in each year. Over the forecast period, the ASFR is adjusted to reflect the annual rate of change in the long term fertility assumptions of the WG's 2018-based Principal projection.

### Deaths & Mortality

A.8     Historical mid-year to -mid-year counts of deaths by sex and five-year age group have been sourced from the ONS MYEs.

A.9     Under the **WG** scenarios, historical counts of deaths have been used until the 2018 base year. The future counts of deaths are reproduced from the base year onwards to ensure consistency with the official projections.

A.10    For the **PG**, **Dwelling-led**, and **Employment-led** scenarios, counts of deaths by age and sex are applied from 2001/02 to 2021/22. From 2022/23, an area-specific and age-specific mortality rate (ASMR) schedule is derived from a 5-year history of historical deaths data (2017/18–2021/22). In combination with the 'population at risk' (i.e., the total population), these ASMR assumptions provide the basis for the calculation of deaths in each year of the forecast period. Over the forecast period, the ASMR is adjusted to reflect the annual rate of change in the long term mortality assumptions of the WG's 2018-based Principal projection.

### Internal Migration

A.11    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 population change' files that underpin the ONS MYEs.

A.12    In the **WG** scenarios, historical counts have been used up to the 2018 base year, with future counts of migrants defined, to remain consistent with the official projections.

A.13    Under the **PG** scenarios, an area and age-specific migration rate (ASMigR) schedule is derived from a defined number of years of historical internal migration data, which then determines the future number of internal in- and out-migrants for the remainder of the plan period. For the **PG-Short Term** scenario, this is derived from five years of historical data (2017/18–2021/22). For the **PG-10YR** scenario, this is derived from ten years of historical data (2011/12–2021/22). For the **PG-Long Term** scenario, this is derived from the full twenty-one years of historical data (2001/02–2021/22).

A.14    Under the **Dwelling-led** and **Employment-led** scenarios, future internal migration rate assumptions are consistent with the **PG-Short Term** scenario, with the level of internal migration altered by the model to meet defined annual dwelling and employment growth targets.

### International Migration

A.15    Historical mid-year to mid-year estimates of immigration and emigration by five-year age-group and sex have been sourced from the 'components of population change files that underpin the ONS MYEs.

A.16    In the **WG** scenarios, historical counts have been used up to the 2018 base year, with future counts of migrants defined, to remain consistent with the official projections.

A.17    In the **PG-Short Term**, **PG 10YR** and **PG-Long Term** scenarios, historical counts of immigration are used from 2001/02 to 2021/22. From 2022/23, future international migration counts are based on the area-specific historical migration data, using a five-year, ten-year and twenty-one-year migration history, respectively. An ASMigR schedule of rates is derived from the migration history and used to distribute the future counts by single year of age.

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A.18    Under the **Dwelling-led** and **Employment-led** scenarios, future international migration assumptions are consistent with the **PG-Short Term** scenario.

# Households & Dwellings

A.19    The Census defines a household 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.20    In POPGROUP, a dwelling is defined as a unit of accommodation which can either be occupied by one household or can be vacant.

A.21    The household and dwelling growth implications of each scenario are estimated through the application of communal population statistics, membership rates, and a household-to-dwelling conversion factor. In the **Dwelling-led** scenarios, these assumptions are used to derive the size of the resident population implied by the growth in the number of dwellings.

A.22    In all scenarios, these assumptions have been sourced from the 2021 Census, and the WG 2018-based household projection model.

## *Communal Population Statistics*

A.23    Household projections in POPGROUP exclude the population 'not-in-households' (i.e., the communal/institutional population). In all scenarios, this data has been drawn from the 2021 Census. Examples of communal establishments include prisons, residential care homes, student hall of residence, and certain armed forces accommodation.

A.24    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.

A.25    The communal population statistics are therefore used to derive the size of the private household population in each scenario.

## *Membership Rates*

3.33    Membership rates are used to calculate the proportion of the household population in each household category by age group and sex (Table 4), taken from the WG 2018-based household model for Powys UA.[24]

3.34    The household population is then converted into households using average household size assumptions, drawn from the WG 2018-based household model.

Table 4: WG 2018-based household categories

| Household Category | |
|---|---|
| 1 person | 4 person (No children) |
| 2 person (No children) | 4 person (2+ adults, 1+ children) |

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[24] For Powys LPA, membership rate assumptions for Powys UA have been applied, in the absence of sub-UA statistics.

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| 2 person (1 adult, 1 child) | 4 person (1 adult, 3 children) |
|---|---|
| 3 person (No children) | 5+ person (No children) |
| 3 person (2 adults, 1 child) | 5+ person (2+ adults, 1+ children) |
| 3 person (1 adult, 2 children) | 5+ person (1 adult, 4+ children) |

Source: WG

### Household to Dwelling Conversion Factor

A.26    The relationship between households and dwellings is modelled using a conversion factor derived from the 2021 Census, using statistics on households (occupied household spaces) and dwellings (shared and unshared). Using this conversion factor, the number of dwellings needed to meet the household growth trajectory has been estimated. In Powys UA, this conversion factor is 0.900. In Powys LPA, this conversion factor is 0.904.

## Labour Force & Employment

A.27    In all scenarios, economic activity rates, an unemployment rate and a commuting ratio are applied to the population growth trajectory to derive the size of the resident labour force, and the level of employment growth that could be supported. In the **Employment-led** scenario, these assumptions are used to derive the population implied by the growth in the level of employment.[25]

### Economic Activity Rates

A.28    Economic activity rates are the proportion of the population that is 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 have been derived from 2021 Census statistics, with adjustments made in line with the OBR analysis of labour market trends in its 2018 Fiscal Sustainability Report (Figure 19).[16]
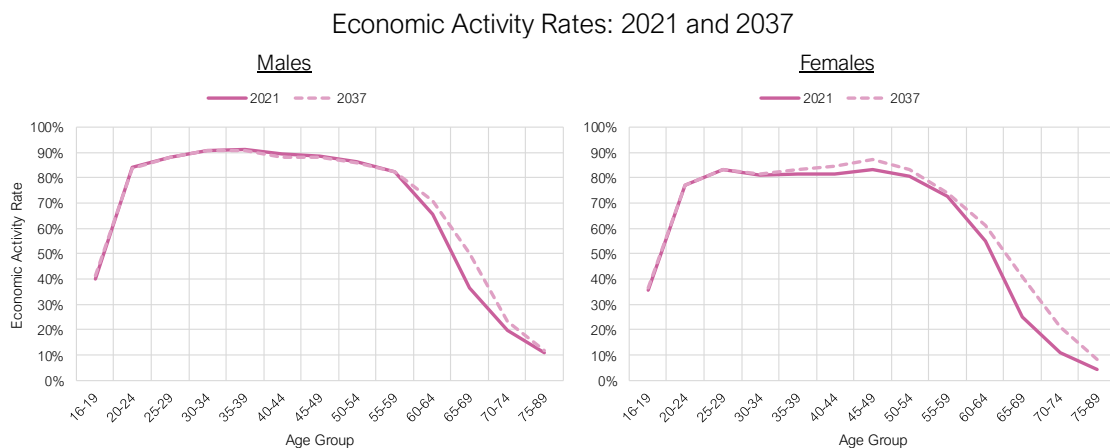


Figure 30: Powys UA 2021 Census economic activity rates with OBR adjustments (2021 and 2037)
Source: ONS, OBR

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[25] For Powys LPA, the economic activity rates, commuting ratio, and unemployment rate for Powys UA have been applied, in the absence of sub-UA statistics.

## *Commuting Ratio*

A.29    The commuting ratio measures the balance between the level of employment in an area 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 of less than 1.00 indicates that employment in the area exceeds the size of the labour force, resulting in a net in-commute.

A.30    In all scenarios, assumptions on Powys UA's commuting ratio have been derived from the APS, published by WG (Figure 21). A commuting ratio of 1.01 has been applied, fixed throughout the forecast period.

## *Unemployment Rate*

A.31    The unemployment rate is the proportion of unemployed people within the economically active population. Historical unemployment rates are sourced from ONS model-based estimates. For Powys UA, an unemployment rate of 3.1% has been applied (based on the latest ONS model-based estimate for mid-year 2023), fixed throughout the forecast period.

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