Rhondda Cynon Taf

Demographic Evidence

June 2023

edge analytics

Acknowledgements

Contents

1 Introduction

Context

1.1   Rhondda Cynon Taf County Borough Council has commenced preparation of its Replacement Local Development Plan (RLDP), covering the plan period 2022–2037. As part of this process, the Council is seeking to assess the appropriate level of growth for the borough in terms of housing and jobs, using the latest available demographic evidence.

1.2   In February 2021, the Welsh Government (WG) published a National Plan[1], setting the agenda for development in Wales to 2040 and providing a strategy that addresses key national priorities, underpinned by an effective national planning system. The plan outlines that conformity between national, regional and local development plans is imperative in achieving these aims, therefore it will be essential that the RLDP reflects the aims and objectives of the National Plan.

Approach

1.3   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.

1.4   Edge Analytics has 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.

1.5   Edge Analytics has used POPGROUP technology to configure a range of growth scenarios for Rhondda Cynon Taf (RCT), incorporating demographic statistics from both the Office for National Statistics (ONS) and the WG, to produce forecasts for a 2022–2037 plan period.

This Document

1.6   **Section 2** of this report provides a demographic profile of RCT, including commentary on the initial 2021 Census results, the latest ONS mid-year population estimates and the components of change (births, deaths and migration) that have driven population growth since 2001. The impact of the COVID-19 pandemic is also considered.

1.7   **Section 3** provides an employment profile, including the size and structure of the labour force, unemployment and commuting profiles, plus the latest employment forecasts for RCT UA.

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[1] WG Future Wales: The National Plan 2040

1.8   **Section 4** presents a range of demographic growth scenarios for RCT LPA, including the latest official projections from the WG, alternative trend scenarios (based on alternative migration histories) and a dwelling-led scenario.

1.9   **Section 5** presents employment-led scenarios for RCT UA, linked to Oxford Economics employment forecasts.

1.10   **Section 6** concludes the analysis with a summary of the findings for the Council to consider in the development of its RLDP.

1.11   To provide an initial indication of the impact of the recent 2021 Census data release, the scenarios presented in the analysis have been rebased to the 2021 Census population and household totals. A summary of the rebased scenario outcomes is presented in **Appendix A**.

1.12   **Appendix B** provides details of the POPGROUP forecasting methodology and the key data inputs and assumptions used in the development of the scenarios.

1.13   Note that where RCT 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 RCT Local Planning Authority (LPA) is referred to, this relates to the area *outside* of the BBNP only.

2 Demographic Profile

Geography

2.1   Located in the South East Wales region, RCT UA borders Powys to the north, Merthyr Tydfil and Caerphilly to the east, Cardiff and Vale of Glamorgan to the south and Bridgend and Neath Port Talbot to the west. The Brecon Beacons National Park (BBNP) intersects the north of the UA. For planning purposes, the RCT LPA is split in to two Strategy Areas, Northern and Southern (Figure 1).
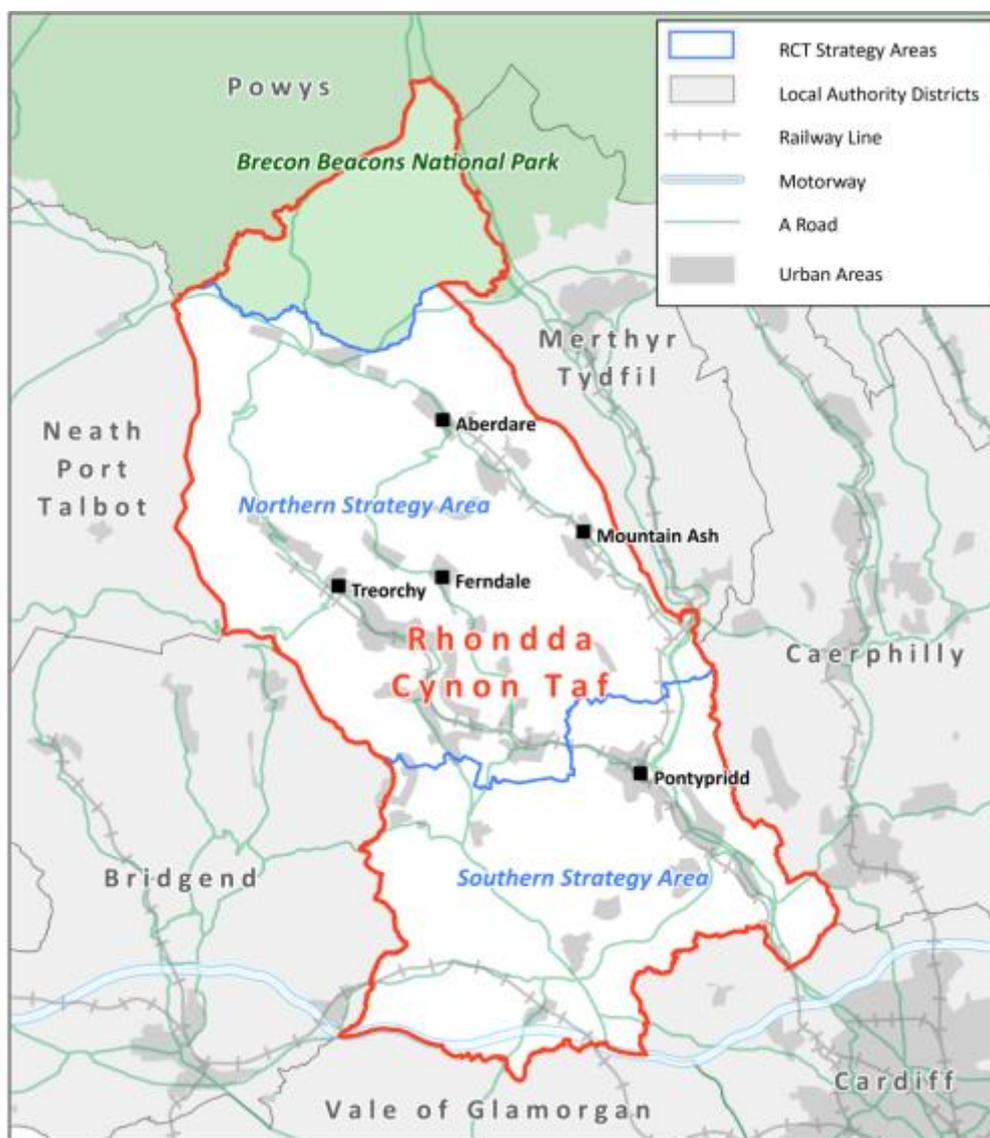
Figure 1: Rhondda Cynon Taf – Geographical Context
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Population

2.2   The 2021 Census population figure for RCT UA is 237,700, a 1.4% increase from the 2011 Census population (Figure 2). This intercensal population growth matches the growth seen nationally but is lower than the average growth experienced across South East Wales (2.9%).

2.3   The 2021 Census figure for RCT UA is 4,173 *lower* than the latest population estimate, the 2020 mid-year population estimate (MYE). In the following sections, the intercensal MYEs are presented, followed by commentary on the differences between the MYEs and the 2021 Census population.

Area	Intercensal Population Growth				
	1971-81	1981-91	1991-01	2001-11	2011-21
Rhondda Cynon Taf	-0.5%	-0.2%	-1.3%	1.1%	1.4%
South East Wales	1.0%	3.1%	0.3%	6.3%	2.9%
Wales	3.6%	4.5%	1.0%	5.5%	1.4%
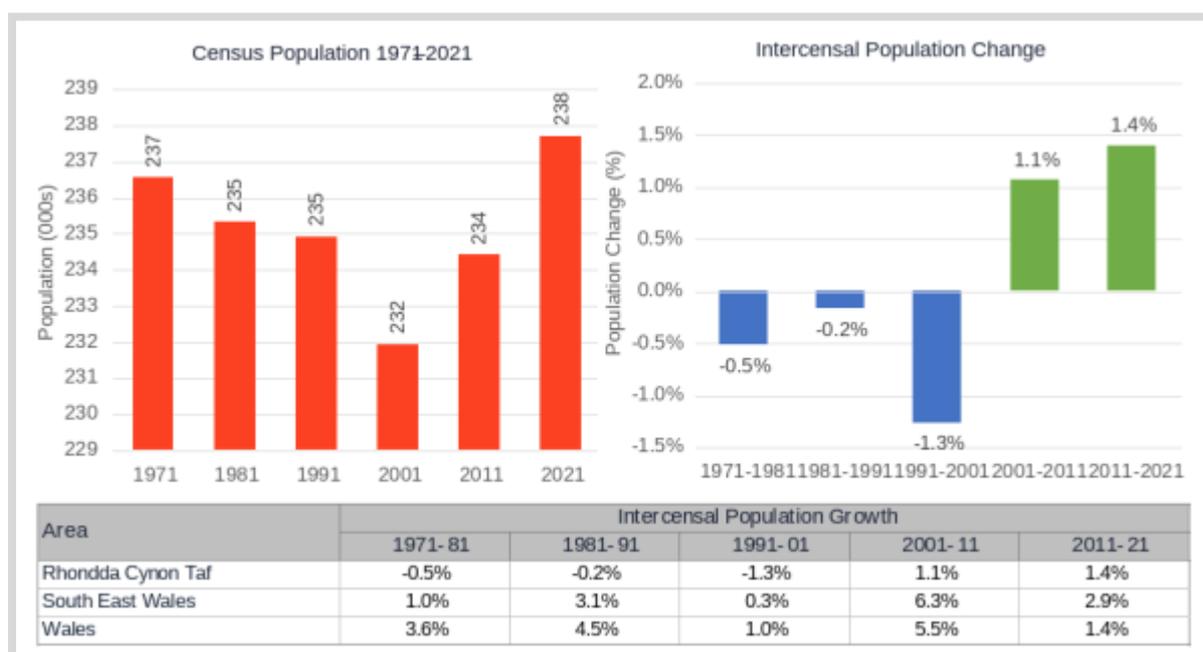
Figure 2: RCT UA – Census population growth
Source: ONS

MYEs & Components of Change

2.4   Between successive Censuses, population estimation is necessary. ONS mid-year population estimates (MYEs) are derived by applying the 'components of population change' to the previous year's MYE. These components of change are natural change (the balance between births and deaths), internal (domestic) migration and international (overseas) migration.

2.5   Figure 3 presents an illustration of the MYEs and components of change for RCT UA, with commentary on each component in the following paragraphs. The components of change chart includes Unattributable Population Change (UPC), which relates to the rebasing of the 2002–2010 MYEs to align with the 2011 Census population count. ONS has not explicitly assigned the UPC adjustment to any one component of change, although it is likely due to issues around the estimation of migration, given that births and deaths are recorded in ONS Vital Statistics.

2.6   Note that even though 2021 MYE were published in December 2022, the corresponding 2020/21 components of change data is not yet available and is due for release in 2023. For this

reason (and because there is relatively little difference between the 2021 Census population estimates and the 2021 MYE), the analysis presented in this report uses the 2021 Census data. Commentary on the differences between the 2020 MYE and the 2021 Census figure for RCT UA is provided following the description of the components of change.
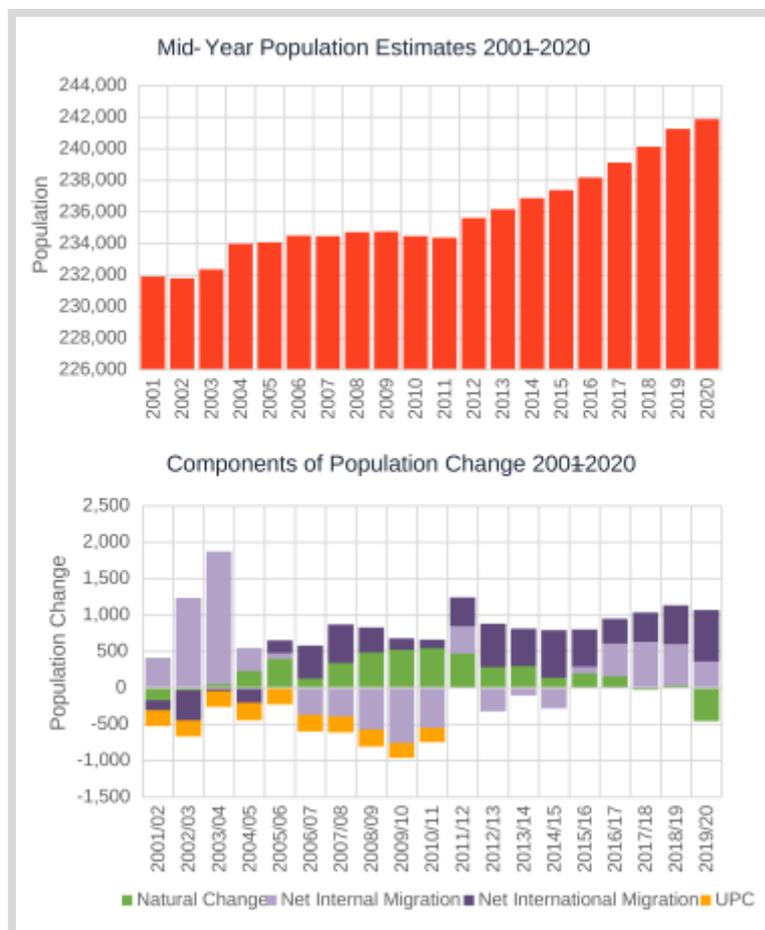
Figure 3: RCT UA – MYEs & Components of Change, 2001–2020
Source: ONS

Population

2.7 According to ONS MYEs, RCT UA has experienced population growth in all years since 2001, with higher annual rates of growth since 2011 compared to the first ten years of the historical period. Between 2001 and 2020, the population of RCT UA increased by approximately 10,000, an increase of 4.3% (Figure 4). This is lower than the rate of growth for both South East Wales (11.0%) and Wales in total (8.9%).
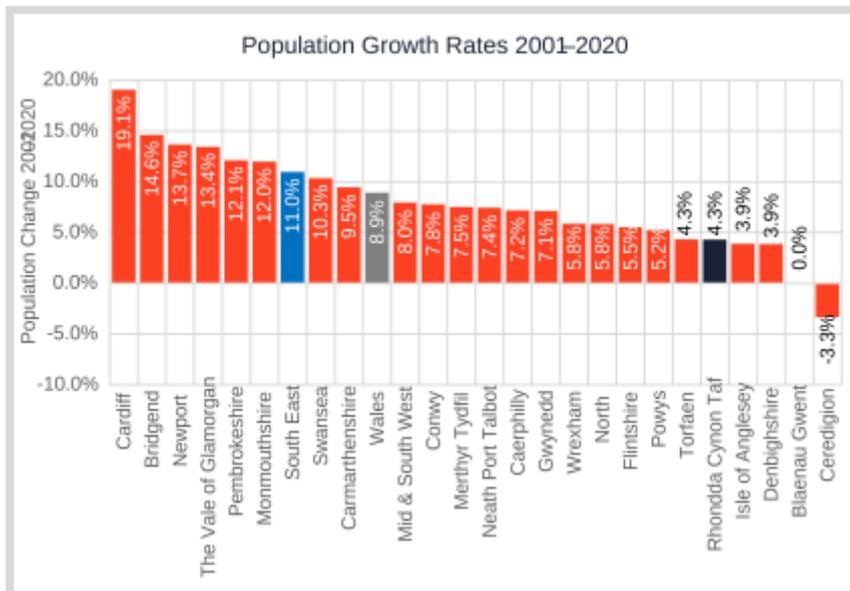
Figure 4: Welsh authorities – Population growth comparison, 2001–2020
Source: ONS

2.8   Population growth across the UA has been focused in the LPA, with the LPA seeing growth of 4.3% between 2001–2020 and the area of the UA in the BBNP seeing a population decline of - 6.7%. Looking at the two Strategy Areas that make up RCT LPA, shows that population change has also varied across the LPA (Figure 5). Between 2001 and 2011, population in the Northern Strategy Area declined by 2.3%, however since 2011 population has grown year-on-year, almost back to 2001 levels. In the Southern Strategy Area, population has increased by 11.1% over the 20-year period, with population growth in almost every year.
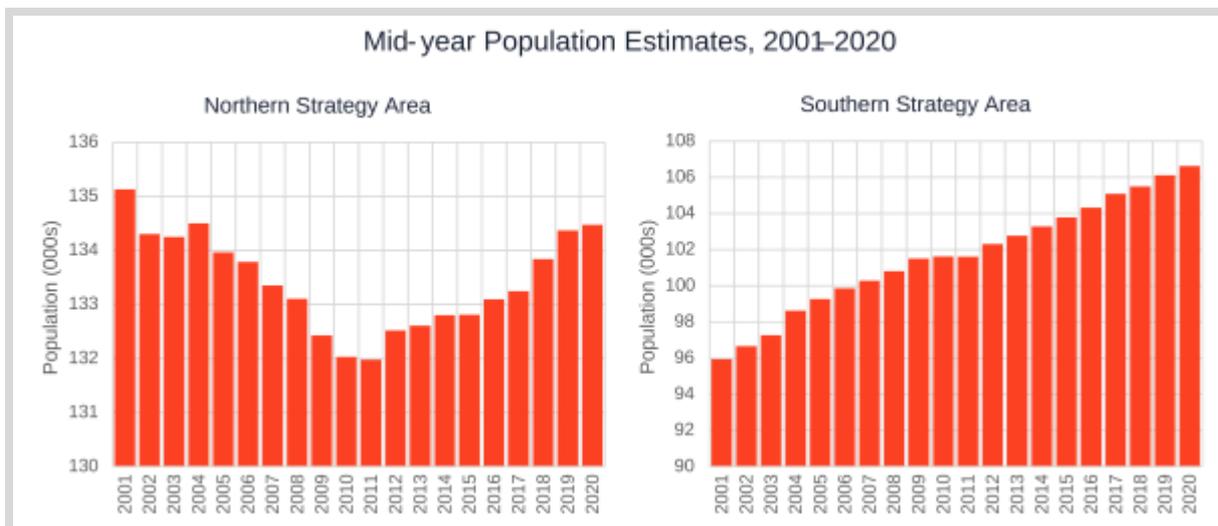
Figure 5: LPA Strategy Areas – MYEs, 2001–2020
Source: ONS

2.9   RCT UA population has seen the largest growth in the older 65–79 and 80+ age groups, with an increase of 24% and 22% respectively, equivalent to approximately 9,000 additional people (Figure 6). At the same time, the size of the working age (15–64) population has increased by

only 3% and the population aged 0–4 has decreased by 7%. This population ageing, which has accelerated since 2007, is an inevitable feature of population change across the UK, as the larger birth cohorts of the post-war period move into the retirement ages.
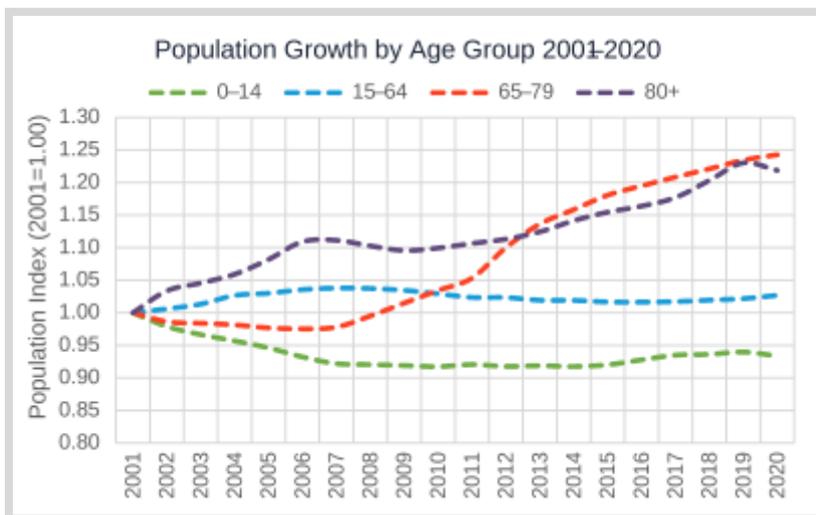
Figure 6: RCT UA – Population growth index by age group, 2001–2020
Source: ONS

2.10   Figure 7 presents population growth by age group for the two LPA strategy areas. Growth in the older 65–79 and 80+ age groups, between 2001 and 2020, has been greater in the Southern Strategy Area (42% and 44% respectively) compared to the Northern Strategy Area (14% and 10% respectively). The size of the working age population (15–64) has shown little change over the historical period, decreasing by 0.4% in the Northern Strategy Area and increasing by 6.9% in the Southern Strategy Area. The decline in the 0–14 population seen across the UA (Figure 6), looks to be a characteristic of the Northern Strategy Area, where the population has declined by 12.3% over the historical period. In the Southern Strategy Area, the 0–14 population has increased by 2.1%.
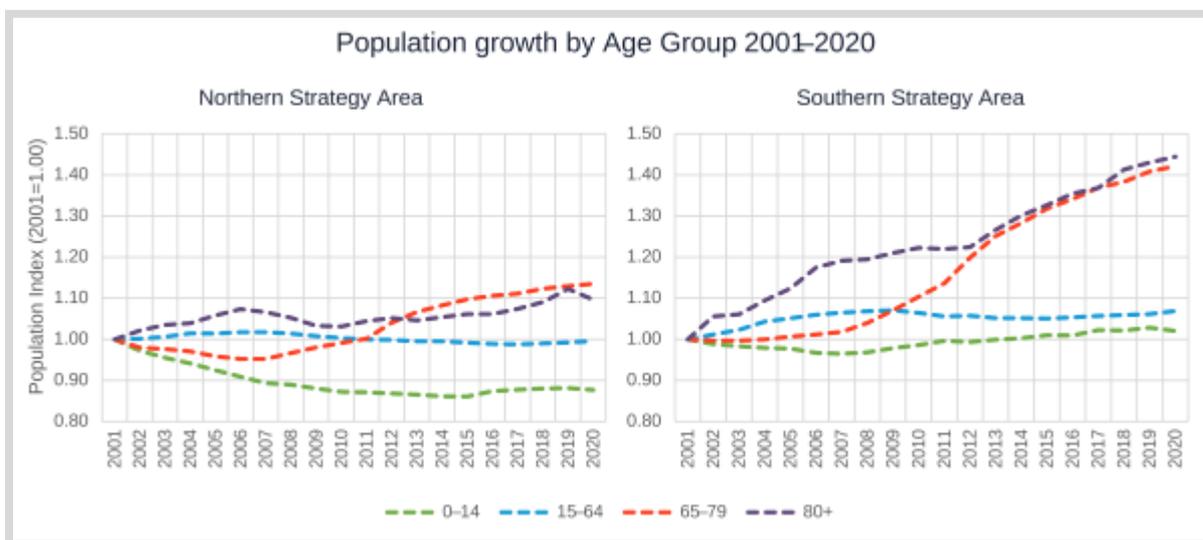
Figure 7: LPA Strategy Areas – Population growth index by age group, 2001–2020
Source: ONS

Natural Change

2.11   The impact of natural change upon population growth in RCT UA has fluctuated throughout the historical period but has been primarily positive (see green bars in Figure 3), as the number of births exceeded the number of deaths (Figure 8). Over the 2001–2020 period, the number of births averaged 2,743 per year and deaths averaged 2,556 per year.

2.12   The number of births in RCT UA increased gradually from 2001/02, peaking at 3,009 in 2010/11. Since then, the number of births has reduced, with the numbers in the last 4 years below the long-term average. 2019/20 saw the lowest level of births experienced throughout the historical period at 2,432.

2.13   Death numbers declined steadily to 2009/10 but have since increased to above the long-term average. In 2019/20, there was a recorded uptick in the number of deaths, reflecting the impact of the first wave of the COVID-19 pandemic; the leading cause of death in England and Wales in 2020. [2]
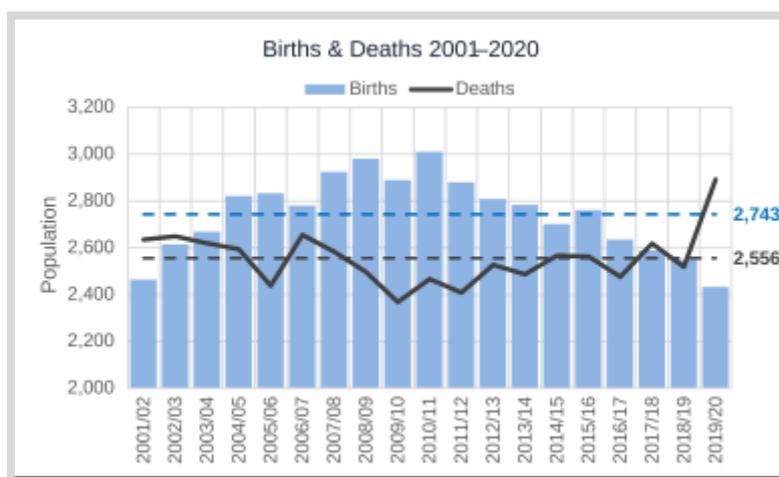
Figure 8: RCT UA – Births & deaths, 2001/02–2019/20
Source: ONS

Internal Migration

2.14   The impact of net internal migration (domestic migration between RCT UA and elsewhere in the UK) has varied since 2001, but has been positive in the last five years, as the flow of people arriving in the UA has exceeded the outflow (Figure 9). This change in flow aligns with the introduction of ONS' Higher Education Leavers Methodology (HELM) [3]. Applied from mid-2017 onwards, this method is designed to better reflect the speed and pattern of movement of students following graduation.

2.15   The dip in both inflow and outflow seen in 2019/20 is likely a result of the ongoing COVID-19 pandemic, which had an unprecedented impact on population movement during 2020.

[2] ONS, Deaths Registered in 2020

[3] ONS Population estimates for the UK, mid-2020: methods guide
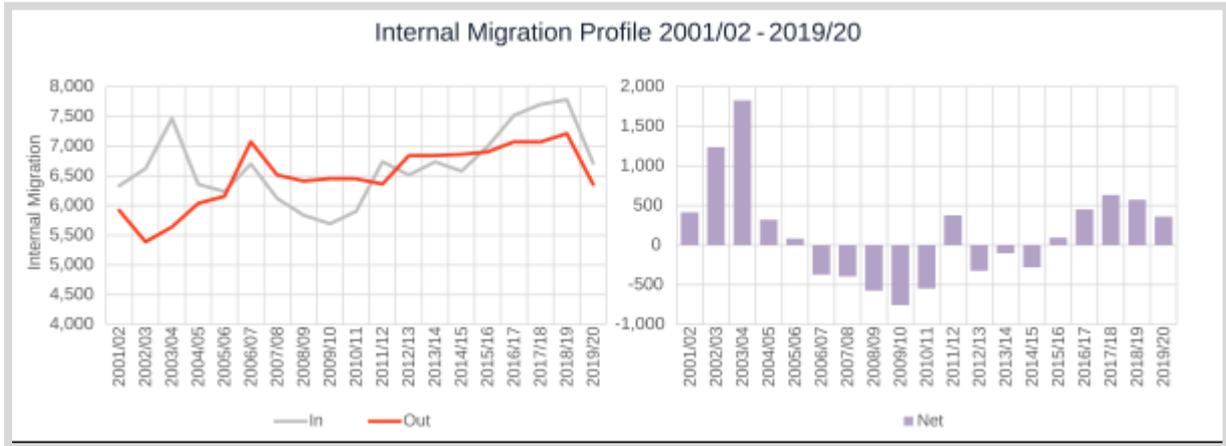
Figure 9: RCT UA – Internal migration profile, 2001/02–2019/20
Source: ONS

2.16 Figure 10 presents net internal migration by age group for the years before the HELM was introduced (2001/02–2015/16) and the years since (2016/17–2019/20). The influence of the HELM is evident in the 20–24 and 25–29 age groups, where the net migration flows have reversed from a net outflow to net inflow as more students are being picked up as returning/moving to RCT UA following graduation. The net migration age profile also illustrates a reverse in the flow for the 15–19 age group from a net inflow to a net outflow as potentially more young people are leaving the UA to go to university.
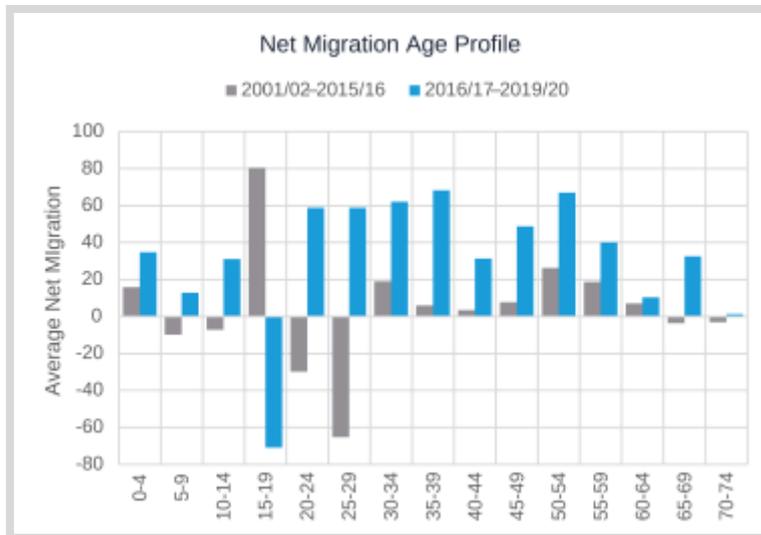
Figure 10: RCT UA – Internal migration age profile
Source: ONS

2.17 The top 10 net inflows and outflows of internal migrants moving to/from RCT UA between 2001–2020 are summarised in Figure 11. RCT UA's most significant net migration inflow exchange has been with Cardiff, in addition to a collection of districts in the rest of Wales and England. Its net migration outflow has been greatest with Bridgend.
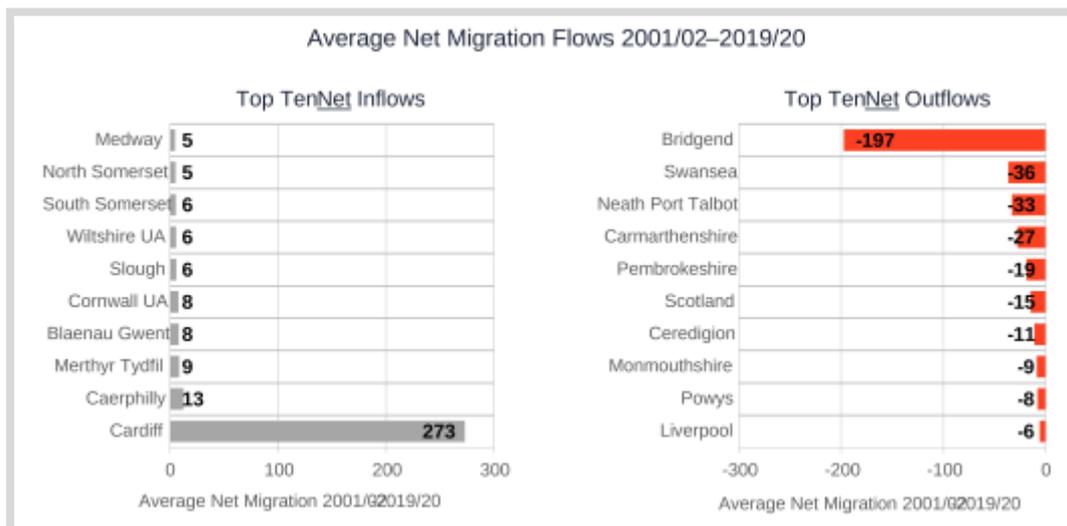
Figure 11: RCT UA – Top 10 net migration inflows and outflows, 2001/02–2019/20
Source: ONS

2.18   Figure 12 provides an illustration of annual migration flows between RCT UA and its neighbouring authorities across the 2001/02–2019/20 historical period. As highlighted in Figure 11, RCT UA has seen most significant internal migrant exchanges with Cardiff and Bridgend. Figure 12 shows that there have been consistently more people moving from Cardiff to RCT UA in most years since 2001 than moving from RCT UA to Cardiff. Only during a short period around the recession, the inflow of migrants dropped to the level of outflow, resulting in a balanced net-flow. A net outflow of migrants from RCT UA to Bridgend has been seen in every year of the historical period, with the outflow of migrants to Bridgend consistently higher than the inflow to RCT UA. The migration flows between RCT UA, and the other five neighbouring authorities have fluctuated since 2001.
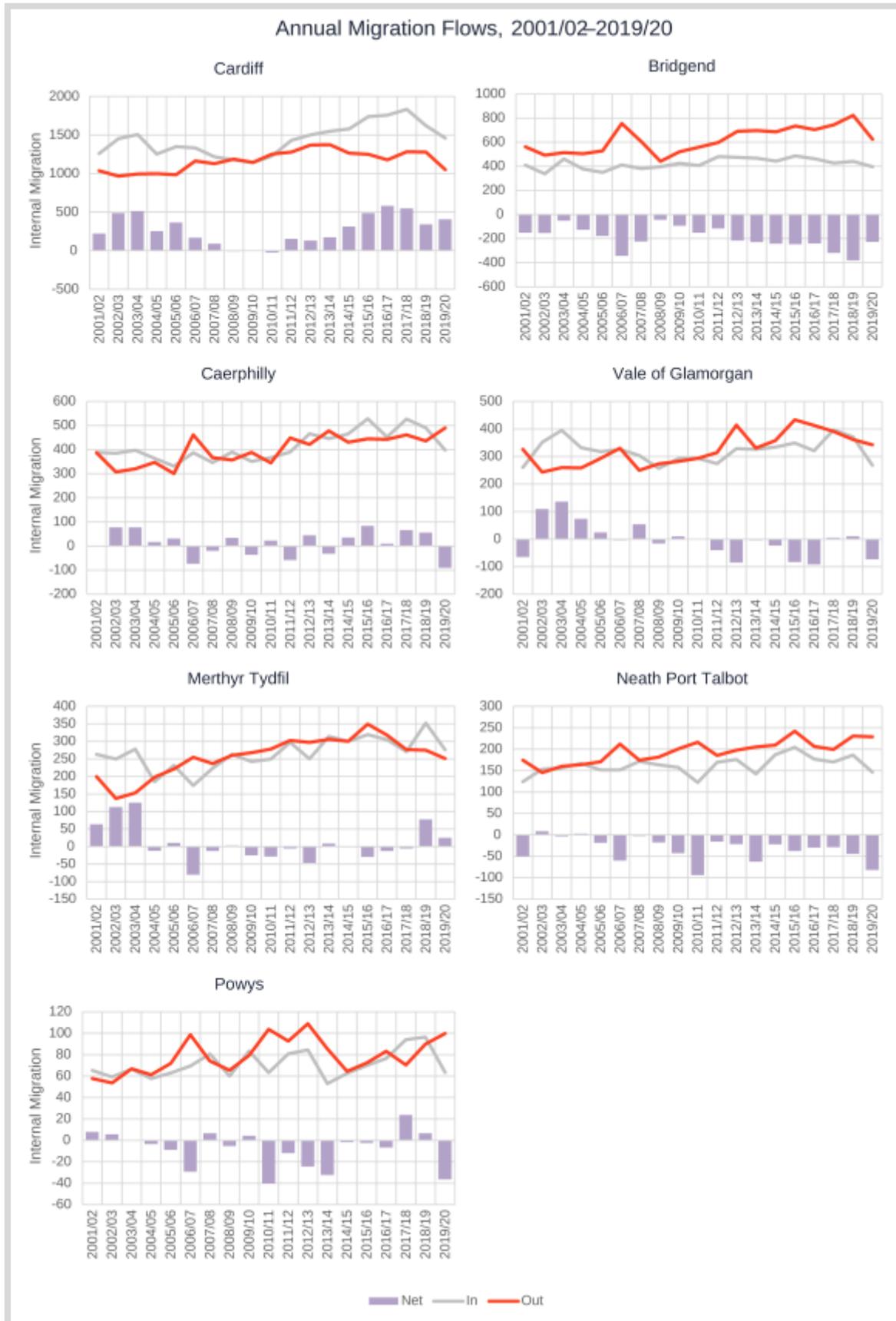
Figure 12: RCT UA – Annual migration flows between neighbouring authorities, 2001/02–2019/20
Source: ONS

International Migration

2.19   Since 2005, net international migration (migration to/from overseas) has been positive in RCT UA and in the latest nine years of historical period it has contributed greatly to population growth, peaking at 708 in 2019/20 (Figure 13).
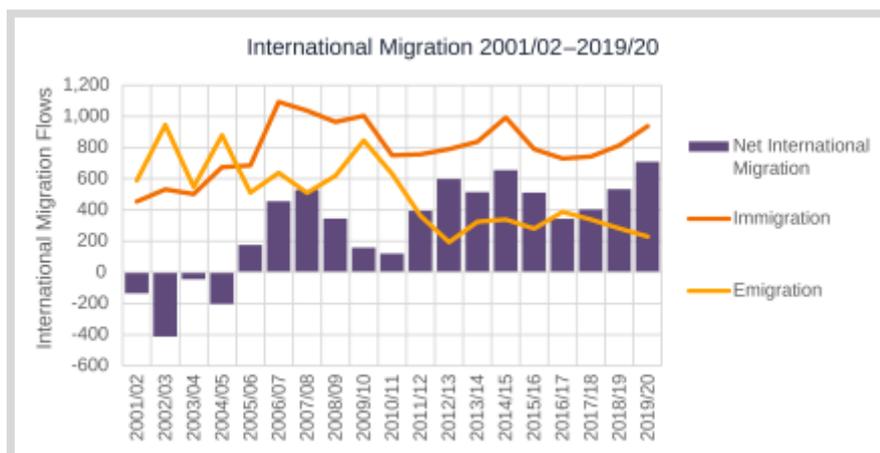
Figure 13: RCT UA – International migration profile, 2001/02–2019/20
Source: ONS

2.20   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.[4] 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 national insurance number (NINo) registrations from the Department for Work and Pensions (DWP).

2.21   The DWP NINo statistics provide a complementary illustration of the international migration *inflow* to RCT UA. These statistics are different to the ONS migration estimates in that they refer only to work-based in-migration and include migrants whose stay may be shorter than 12 months. NINo registrations in RCT UA peaked in 2007 and again in 2016 (Figure 14). In 2020, the largest proportion of registrations were associated with workers from countries in the New Commonwealth, including India and Nigeria. The proportion of workers from the European Union (EU) saw a large decline in 2020, most likely as a result of Brexit.

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[4] Statement from ONS on the reclassification of international migration statistics, August 2019
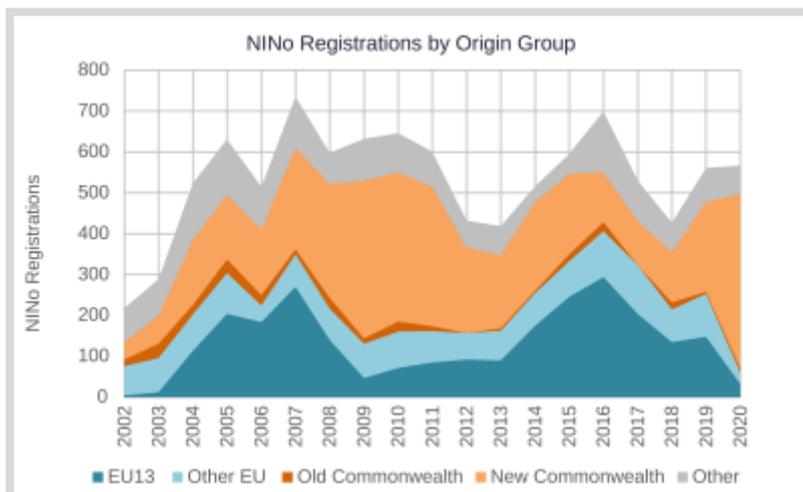
Figure 14: RCT UA – NINo registrations by country of origin category, 2002–2020
Source: DWP. Note: EU13 refers to countries who have joined the EU since 2004: Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.

2021 Census vs. Mid-Year Population Estimates

2.22   The 2021 Census population of 237,700 for RCT UA is 4,173 *lower* than the 2020 MYE figure of 241,873, representing the greatest year-on-year decrease in population since 2001, at -1.7%; between 2011 and 2020, population growth averaged 0.35% per year (Figure 15).
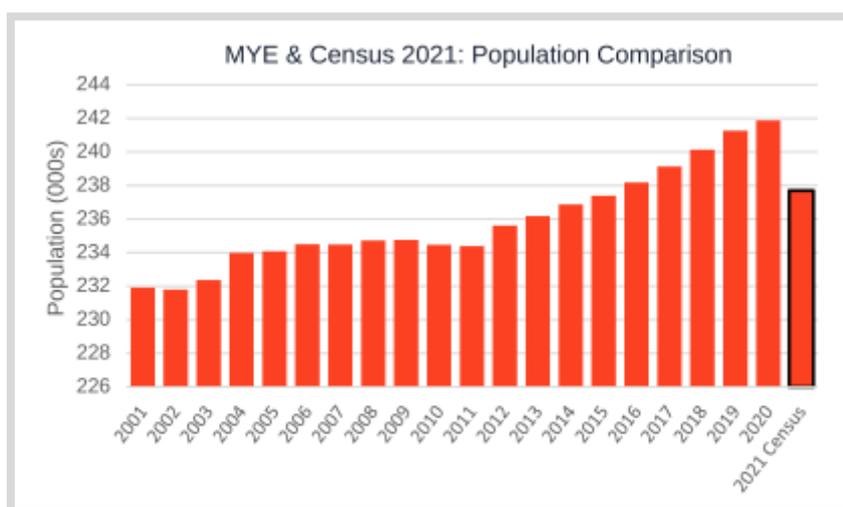
Figure 15: RCT UA – MYEs & Census 2021 population comparison
Source: ONS

2.23   Compared to other Welsh authorities, the population difference seen in RCT UA between the 2020 MYE and 2021 Census population closely aligns with the national and regional differences (-2.0% and 1.8%), with only two authorities, Powys and Newport, showing population growth between the 2020 MYE and the 2021 Census (Figure 16).
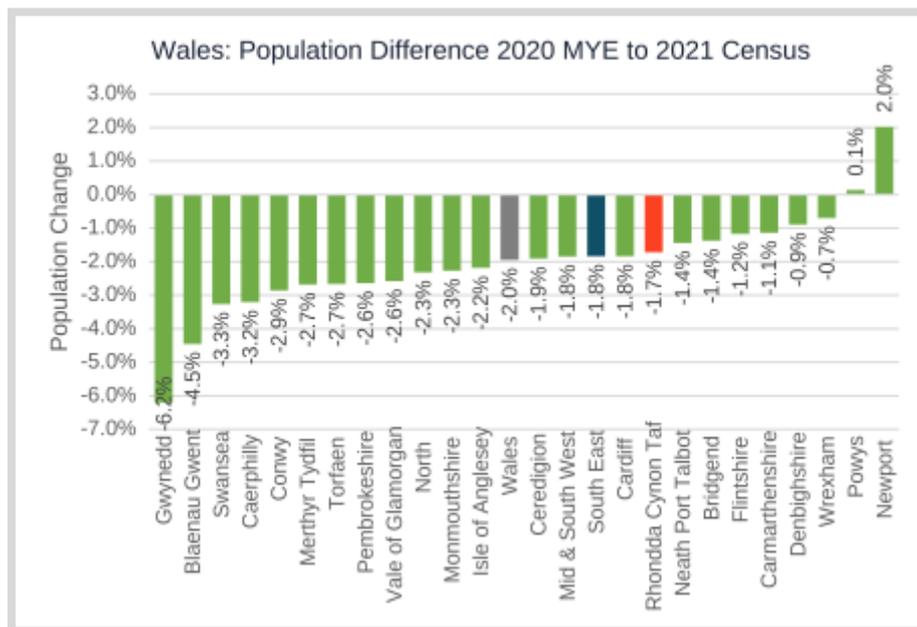
Figure 16: Welsh authorities – Population change, 2020 MYE to 2021 Census
Source: ONS

2.24   Whilst the 2020–2021 population decline implied by the Census count in RCT UA could reflect reality, it is more likely a results of population overestimation between the 2011 and 2021 Censuses, as was seen between the 2001 and 2011 Censuses in RCT UA. This 2001–2011 intercensal overestimation is represented by the UPC adjustment, as illustrated in orange in Figure 3.

2.25   The reasons for the 2021 Census/MYE discrepancy will likely become clear with future data releases, specifically the revised inter-census MYEs, due for release in early 2023. It is possible that a continued intercensal population over-estimation has occurred due to the difficulties in robustly estimating migration flows to and from the authority, as births and deaths are robustly recorded in each year.

Housing Completions

2.26   When considering the drivers of population growth, it is important to also consider the scale and distribution of housing growth, as an increase in housing supply can attract people to move to an area.

2.27   Since 2010, there have been, on average, 495 net housing completions each year in RCT LPA (Figure 17), a net increase of 5,441 overall. Completion rates were highest between 2013/14 and 2017/18, peaking at 716 in 2016/17. In the latest three years rates have fluctuated around 400 dwellings per annum (dpa). In terms of the spatial distribution, 63% of the overall housing growth has taken place in the Southern Strategy Area, with only two out of the eleven years, 2018/19 and 2019/20, seeing a higher proportion of completions in the Northern Strategy Area.

Figure 17: RCT LPA – Net housing completions, 2010/11–2020/21
Source: RCT County Borough Council

COVID-19 Context

2.28   The migration estimates presented above cover the time period to mid-year 2020, covering the first 3 months of the COVID-19 pandemic. For an indication of the impacts on the mobility and movement of people since the start of the pandemic, a range of data from Google, HM Land Registry and Royal Mail are presented below.

Daily Mobility

2.29   The unprecedented impact of COVID-19 can be seen by looking at commuting mobility statistics, which have been derived from aggregated and anonymised data from Google users. Google has made its data available for analysis during the pandemic through a series of 'Community Mobility Reports'[5], showing the movement trends across different categories of place.

2.30   For each category, the Google data illustrates the daily change in mobility against a 'baseline', which represents a *normal* value for that day of the week (calculated from a 5-week period 3rd Jan–6th Feb 2020). For illustration, the daily statistics have been aggregated to produce a monthly profile for RCT UA (Figure 18).

2.31   From February 2020 to April 2020, a sharp reduction in movement was recorded in all places with the exception of Residential, reflecting the first national lockdown. A similar pattern was evident during the second and third lockdowns, with a recovery in movement between restrictions. From February to June 2021, movement in all places began to return towards 'normal' levels, however a rise in cases following the lifting of restrictions saw a deceleration in recovery.

2.32   Since the start of 2022, Retail & Recreation and Residential activities have almost returned to pre-pandemic levels, whilst Grocery & Pharmacy and Parks activities continue to increase

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[5] Google Community Mobility Reports

compared to the baseline. Workplaces and Transit Station activities remain well below pre-pandemic levels, as businesses continue to adopt permanent working from home and hybrid working policies.
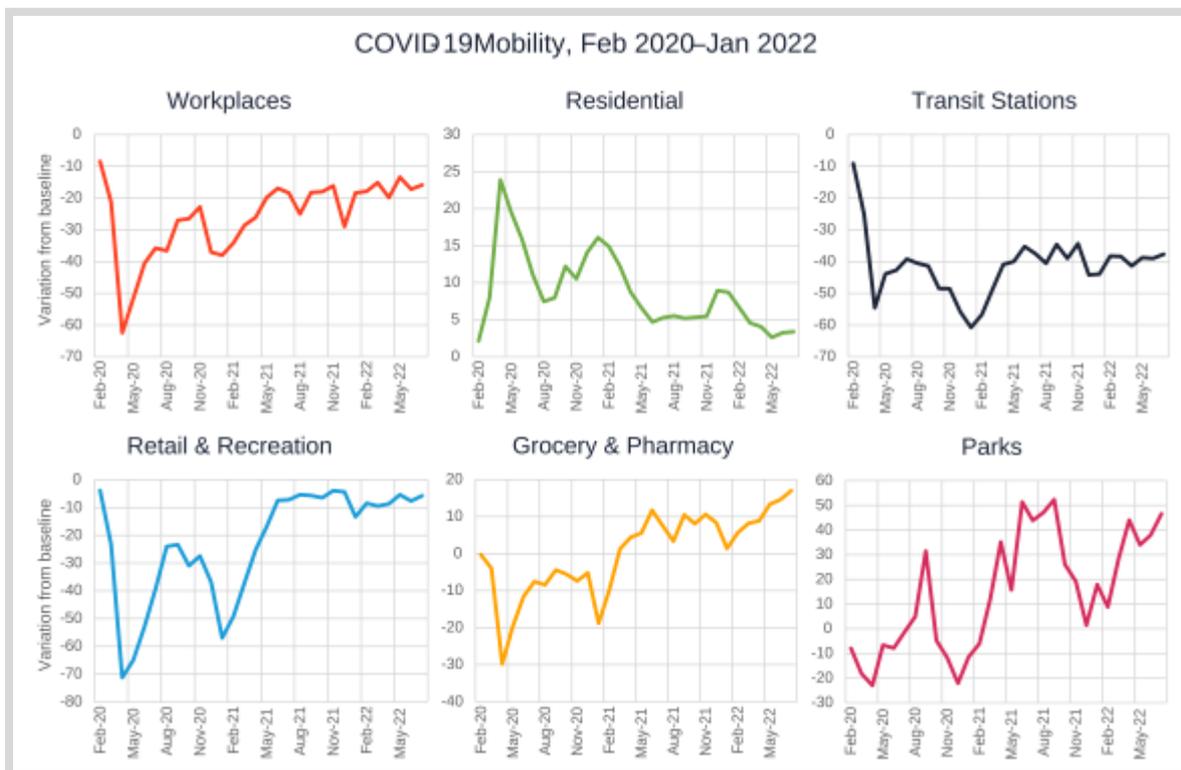
Figure 18: RCT UA – Mobility trends, February 2020–July 2022
Source: Google

Home Moves

2.33   Royal Mail provides a mail redirection service to home movers and the data provides a proxy measure of migration within the UK during the COVID-19 pandemic.[6] During 2020 and early 2021, RCT UA experienced a negative net balance of moves (i.e. more outflows than inflows) than would be expected from the 5-year pre-COVID average (2015–2019) (Figure 19). Since July 2021, the number of movers appears to be making a strong recovery, with 6 out of the 11 months up to May 2022 exceeding pre-pandemic levels.

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[6] Royal Mail Annual statistics for UK home movers
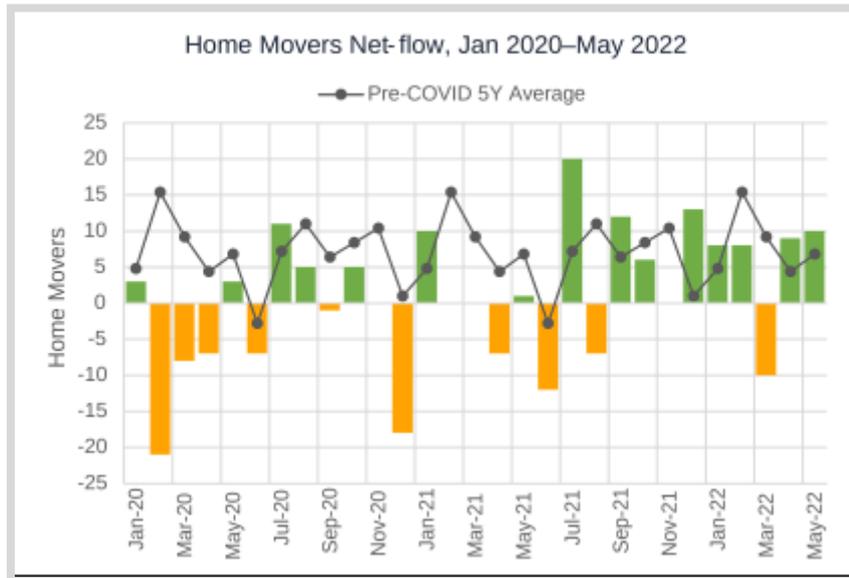
Figure 19: RCT UA – Home movers net-flow, January 2020–May 2022
Source: Royal Mail

2.34   Land Registry data provides an indication of how house sale transactions have been impacted by the COVID-19 pandemic, for both existing and new properties.[7] Figure 20 illustrates the drop in transactions in RCT UA after March 2020. The easing of lockdown restrictions in summer 2020 saw a rebound in property transactions, followed by a lesser decline during the third lockdown. Transactions for both existing and new properties returned to pre-pandemics in 2021, with a spike in June 2021 likely due to the introduction of the stamp duty holiday.

Figure 20: RCT UA – Land registry transactions, January 2018–May 2022
Source: HM Land Registry. Note: due to a lag in data collection, the most recent months are likely to be artificially low.

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[7] HM Land Registry Open Data

3 Employment Profile

Introduction

3.1   The following section provides a profile of RCT UA's labour force, presenting rates of economic activity, together with a historical profile of unemployment and commuting patterns. An employment forecast for RCT UA, produced by Oxford Economics, is presented, followed by a 'Policy-on' employment forecast generated by BE Group, based on the Oxford Economics forecast. Assumptions on economic activity, unemployment and commuting, along with the employment outcomes from the Oxford Economics forecast and the Policy-on forecast, are used as key assumptions in the development of the demographic and employment-led scenarios, presented in Sections 4 and 5.

Labour Force Profile

Labour Force & Economic Activity

3.2   Economic activity rates are the proportions of population that is actively involved in the labour force, either employed or unemployed looking for work. At the 2011 Census, there were an estimated 108,730 people classified as 'economically active' in RCT UA, equivalent to 63% of the usually resident population aged 16–74 (Table 1). This is lower than the economic activity rate for Wales and South East Wales (both 66%).

Table 1: 2011 Census aggregate economic activity rates

	RCT UA	South East Wales	Wales
Usually resident population (age 16–74)	172,047	1,090,427	2,245,166
Economically active population	108,730	718,329	1,476,735
Economically active population (%)	63%	66%	66%

3.3   Figure 21 presents economic activity rates by five-year age group (16–89), comparing profiles from the 2001 and 2011 Censuses, for males and females. Rates amongst males are higher than females across all age groups. Rates amongst females increased between 2001 and 2011 across all age groups, with the exception of the 16–19 age group, whilst males only saw substantial increases in the 40+ age groups, with the rates for other age groups showing very small increases or declining. The decline of the economic activity rates of the 16–19 age group is likely a reflection of a greater proportion of this age group staying in education/training beyond the age of 16.

3.4   In the absence of updated 2021 Census economic activity rates, evidence on potential changes to economic activity rates is drawn from the Office for Budget Responsibility's (OBR) analysis of labour market trends within its 2018 Fiscal Sustainability Report.[8] The report presents long-term labour force forecasts, including estimated changes to age and sex-specific economic activity rates. The forecasts are 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. Adjusting the 2011 Census economic activity rates in line with the OBR forecasts provides an estimate of economic activity rates in RCT UA by the end of the plan period (Figure 21). Rates are estimated to increase in all but the youngest age group for females, and in all but the 30–49 age group for males.
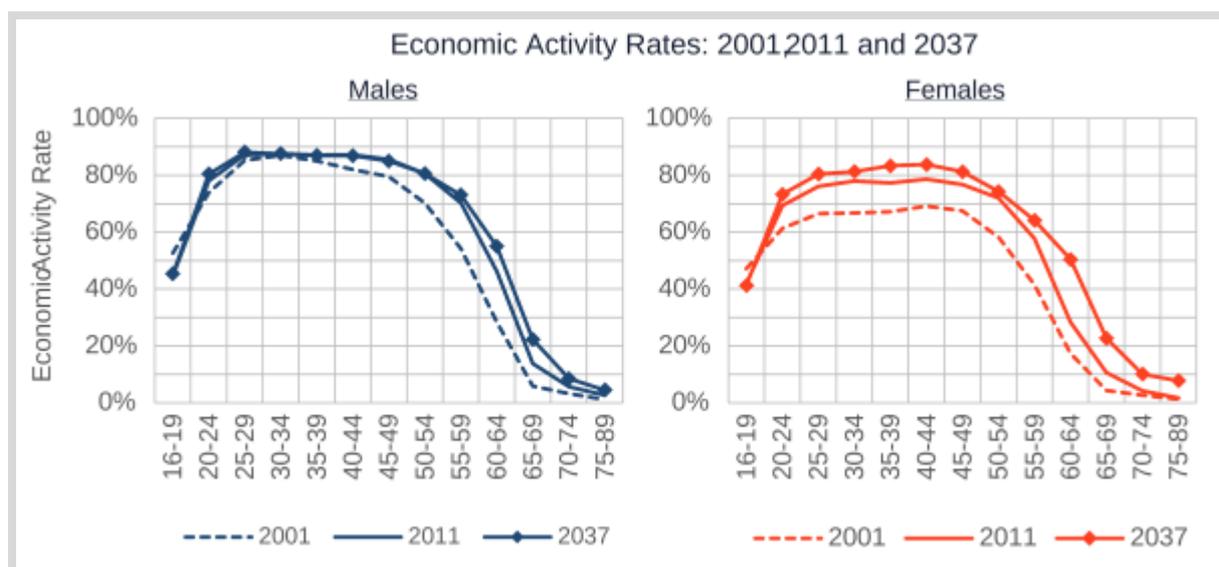
Figure 21: RCT UA – Economic activity rates by sex and age (16–89), 2001, 2011 & 2037
Source: ONS, OBR

Unemployment

3.5   Unemployment rates measure the proportion of unemployed people within the resident labour force. Data from ONS indicates that until 2021, RCT UA consistently had an unemployment rate higher than the national average and higher than or equal to the regional average (Figure 22).[9] Unemployment rates were highest following the 2008/2009 recession, peaking in 2012 at 11.3%. Between 2013 and 2016, there was a sharp reduction in unemployment rates. In 2021, the rate of unemployment was the lowest it had been in RCT UA throughout the historical period and lower than both the regional and national average.

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[8] OBR Fiscal Sustainability Report, July 2018
[9] ONS model-based estimates of unemployment, Annual Population Survey, year ending December 2021
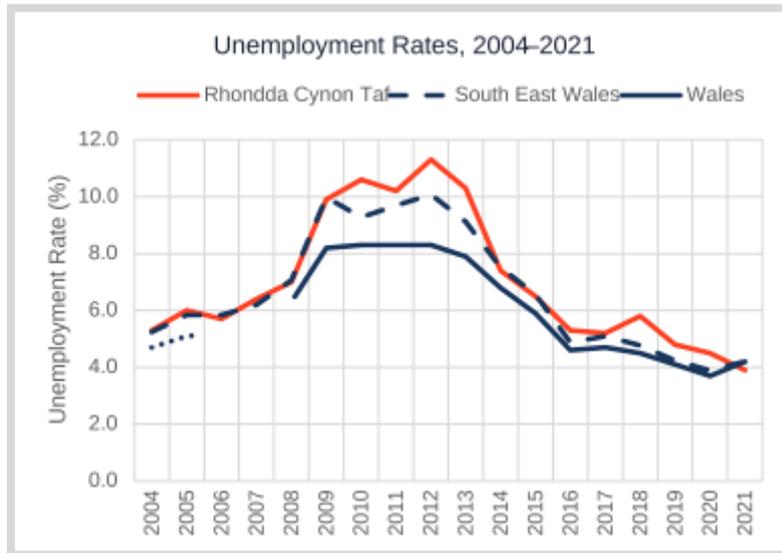
Figure 22: Unemployment rates (%), 2004–2021
Source: ONS

Commuting Patterns

3.6   Figure 23 presents the top 5 commuting inflows and outflows for RCT UA, from the 2011 Census, highlighting the connectivity with its neighbouring authorities. The largest flow of commuters at the 2011 Census was from RCT UA to Cardiff (16,086), over 3 times the flows of commuters from Cardiff into RCT UA (5,043). RCT UA was a net *exporter* of workers to Cardiff (-11,043), Bridgend (-1,236), Merthyr Tydfil (-967) and the Vale of Glamorgan (-736) but a net *importer* of workers from Caerphilly (279).
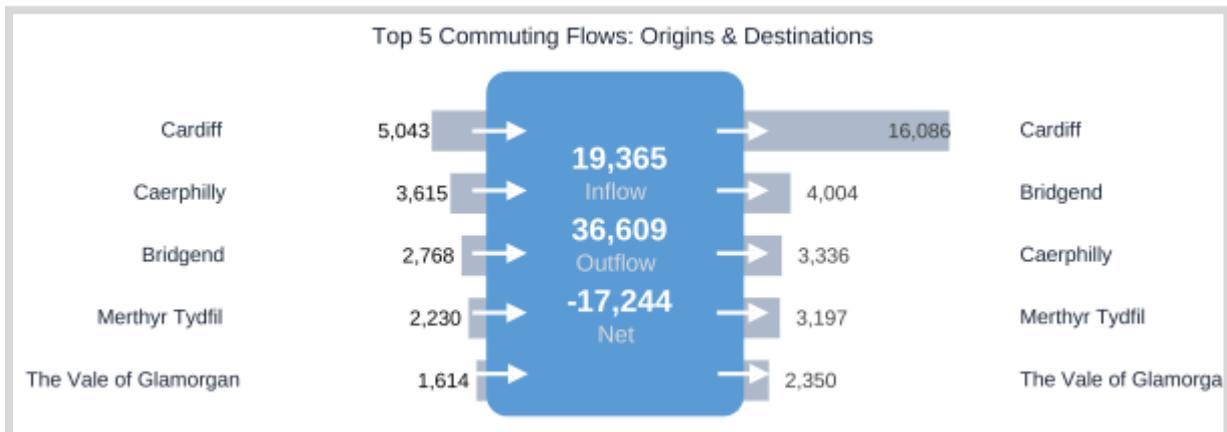
Figure 23: RCT UA – 2011 Census commuting flows: Top 5 inflows and outflows
Source: 2011 Census

3.7   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). According to the 2011 Census[10], the number of resident workers in RCT UA was approximately 99,690, with the number of people employed in the area at 82,446, resulting in a commuting ratio of 1.21, indicating a net out-commute.

Employment Growth Forecasts

3.8　To support the demographic analysis for RCT, the latest economic forecast from Oxford Economics has been acquired. This forecast presents the level of workplace-based employment in RCT UA from 2001–2040. Employment forecasts are provided by Oxford Economics for both workplace-based jobs and workplace-based people. Jobs-based employment measures the number of jobs; therefore, one person can have more than one job. People-based employment measures the number of employed people and is calculated by adjusting the number of jobs to account for double-jobbing. The POPGROUP model, used to develop the growth scenarios presented in the next section, requires a people-based measure of employment; this report therefore focuses on this measure.

3.9　In addition to the baseline Oxford Economics forecast, BE Group have generated a Policy-on scenario, by applying adjustments to the Oxford Economics jobs-based employment forecast that assume specific economic growth interventions to support growth primarily in the industrial B2/B8 land use classes. This jobs-based Policy-on forecast has been converted into a people-based forecast by applying the same jobs to people ratio used in the baseline forecast. Both the baseline Oxford Economics forecast and the Policy-on forecast of people-based employment are presented in Figure 24.

3.10　Between 2001 and 2022, the number of people in employment in RCT UA grew by 23%, with annual growth averaging at 1.1% (Figure 24). Unlike many areas, employment in RCT UA increased in 2020 and again in 2021, despite the economic impacts of the COVID-19 pandemic. Between 2022 and 2040 the likely number of employed people is forecast to decline by 207 (-0.2%) under the Oxford Economics scenario but is forecast to increase by 1,784 (2.0%) under the Policy-on scenario.

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[10] Commuting data from the 2021 Census is not due to be released until Spring 2023.
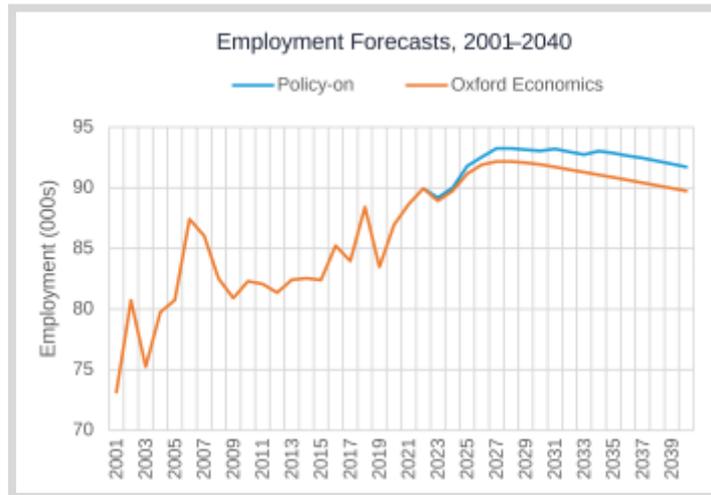
Figure 24: RCT UA – People-based employment forecasts, 2001–2040
Source: Oxford Economics, BE Group

4 Demographic Scenarios

Scenario Definition

4.1 POPGROUP (PG) technology has been used to develop a range of demographic scenarios for RCT LPA (excluding the area of RCT within the BBNP) (Table 2). Further information on POPGROUP methodology, data inputs and assumptions can be found in Appendix B.

4.2 The WG scenarios include the 2014-based *Principal* projection, plus the full suite of variants that make up the latest 2018-based projections. These scenarios have 2014 and 2018 base years respectively. Note that the outcomes of these scenarios will differ to the published WG projections for RCT UA, as the scenarios have been configured excluding the area of RCT within the BBNP.

4.3 Two additional trend-based scenarios have been developed, using alternative migration histories to calibrate future growth assumptions. These 'PG' trend scenarios are based on a continuation of short- (5-year) and long-term (19-year) migration histories and incorporate a 2020 MYE base year. In these scenarios, fertility and mortality assumptions are drawn from the latest 2018-based WG projection.

4.4 The dwelling-led scenario considers how a continuation of a 5-year history of completion rates in RCT LPA would impact upon future population growth, again with a 2020 base year. In a dwelling-led scenario, the annual change in the number of dwellings is used to derive a household and population growth profile, using key assumptions on dwelling vacancy, the communal population (i.e. population not in households), and rates of household formation (membership rates). Domestic migration is used to balance between population and dwelling growth; if the resident population is insufficient in size and structure to fill the additional dwellings, a higher level of net in-migration will result.

4.5 In all scenarios, household and dwelling growth have been estimated using membership rate and communal establishment assumptions from the WG 2018-based household projection model. In modelling the relationship between households and dwellings a vacancy rate of 5.3% has been applied, derived from 2011 Census statistics for RCT LPA.

4.6 To derive the level of employment growth that could be supported in each of the scenarios, assumptions on economic activity rates, unemployment rates and commuting have been applied to each of the scenario population growth trajectories. The economic activity rates (derived from the 2011 Census statistics, with adjustments in line with the Office for Budget Responsibility's (OBR) labour market analysis[11]) determine the estimated annual change in the size of the resident labour force, whilst the unemployment rates (from ONS) and commuting

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[11] OBR Fiscal Sustainability Report, July 2018

ratios (derived from 2011 Census statistics) link the labour force to workplace-based employment.

4.7   Appendix A provides a summary of the following scenarios, rebased to the 2021 Census population and household figures.

Table 2: Scenario definition

WG-2014	Replicates the WG 2014-based *Principal* population projection, using historical population evidence for 2001–2014.
WG-2018	Replicates the WG 2018-based *Principal* population projection, using historical population evidence for 2001–2018.
WG-2018-HIGHPOP	Replicates the WG 2018-based *High* population projection, using historical population evidence for 2001–2018 and incorporating high fertility, mortality and migration assumptions.
WG-2018-LOWPOP	Replicates the WG 2018-based *Low* population projection, using historical population evidence for 2001–2018 and incorporating low fertility, mortality and migration assumptions.
PG-5Y	Uses an ONS 2020 MYE base year and calibrates its migration assumptions from a 5-year historical period (2015/16–2019/20).
PG-Long Term	Uses an ONS 2020 MYE base year and calibrates its migration assumptions from a 19-year historical period (2001/02–2019/20).
Dwelling-led 5Y	Models the population impact of an average annual dwelling growth of +509 dwellings per annum (dpa), based on a 5-year history of housing completions in RCT LPA (2016/17–2020/21).

Scenario Outcomes

Scenario Summary

4.8   The population growth trajectories for RCT LPA are presented in Figure 25, from 2001 to 2037. In Table 3, each of the scenarios is summarised in terms of population and household growth for the 2022–2037 plan period, alongside the average annual net migration and associated dwelling and employment growth outcomes.

4.9   Population change for the 2022–2037 period ranges from 0.1% under the **WG-2018-LOWPOP** scenario to 5.6% under the **WG-2018-HIGHPOP** scenario. This range of population growth equates to estimated dwelling growth outcomes between 353 and 721 dpa and employment growth outcomes of between 12 and 355 per year.
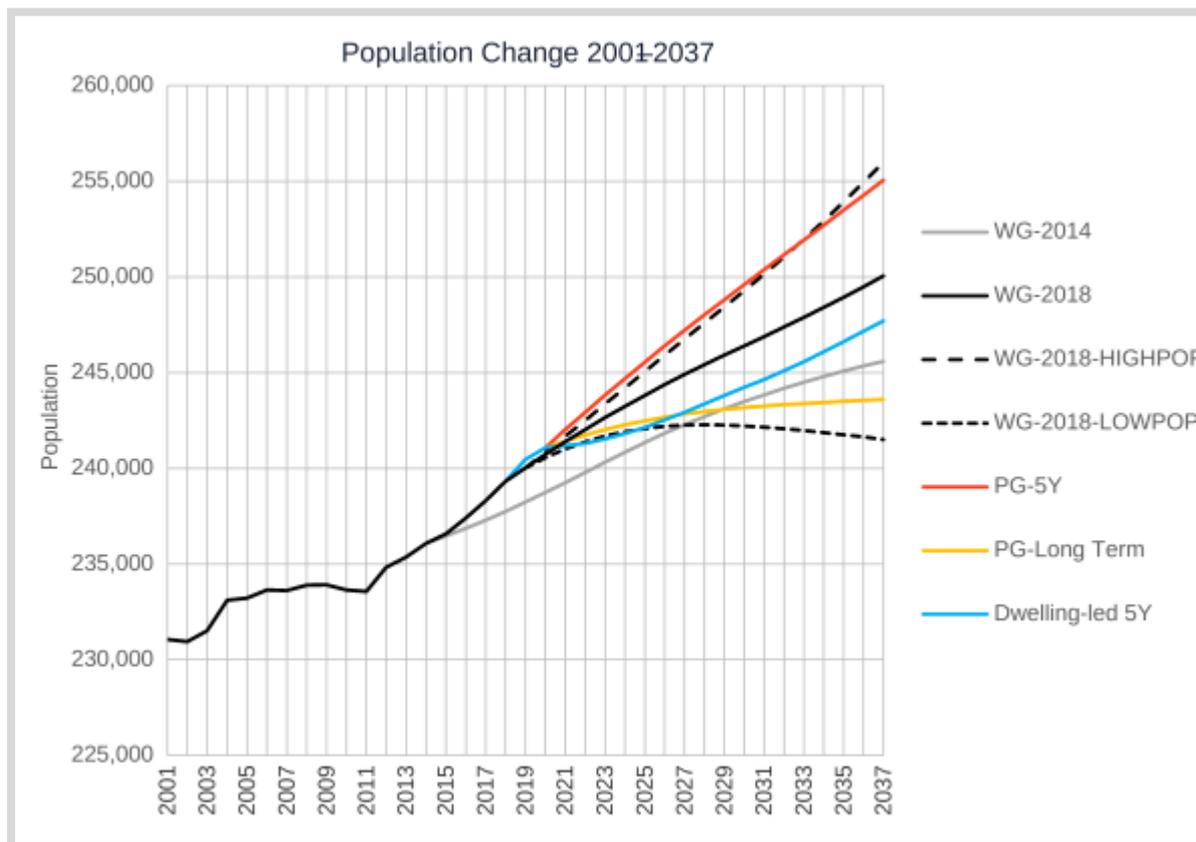
Figure 25: RCT LPA – Demographic growth scenarios, 2001–2037
Source: ONS, Edge Analytics POPGROUP modelling

Table 3: RCT LPA – Scenario outcomes, 2022–2037

Scenario	Change 2022–2037				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Employ-ment
WG-2018-HIGHPOP	13,490	5.6%	10,238	9.5%	874	721	343
PG-5Y	12,135	5.0%	9,686	9.0%	914	682	355
WG-2018	8,020	3.3%	8,009	7.5%	705	564	266
Dwelling-led 5Y	6,406	2.7%	7,234	6.8%	610	509	187
WG-2014	5,807	2.4%	6,986	6.6%	308	492	12
PG-Long Term	1,867	0.8%	5,429	5.1%	336	382	92
WG-2018-LOWPOP	129	0.1%	5,013	4.7%	543	353	182

Source: ONS, Edge Analytics POPGROUP modelling

4.10   The **WG-2018** projection for RCT LPA estimates a higher growth outlook (3.3%) compared to the **WG-2014** projection (2.4%), with a very different components of change profile (Figure 26). The WG's 2018-based projections have introduced dampened assumptions on both fertility and mortality. These assumptions supress future birth trajectories and increase the rate at which

deaths occur due to reduction in life expectancies. In RCT LPA, the effect of the revised fertility and mortality assumptions in the **WG-2018** scenario is lessened by the positive effects of migration that have been experienced since 2014.
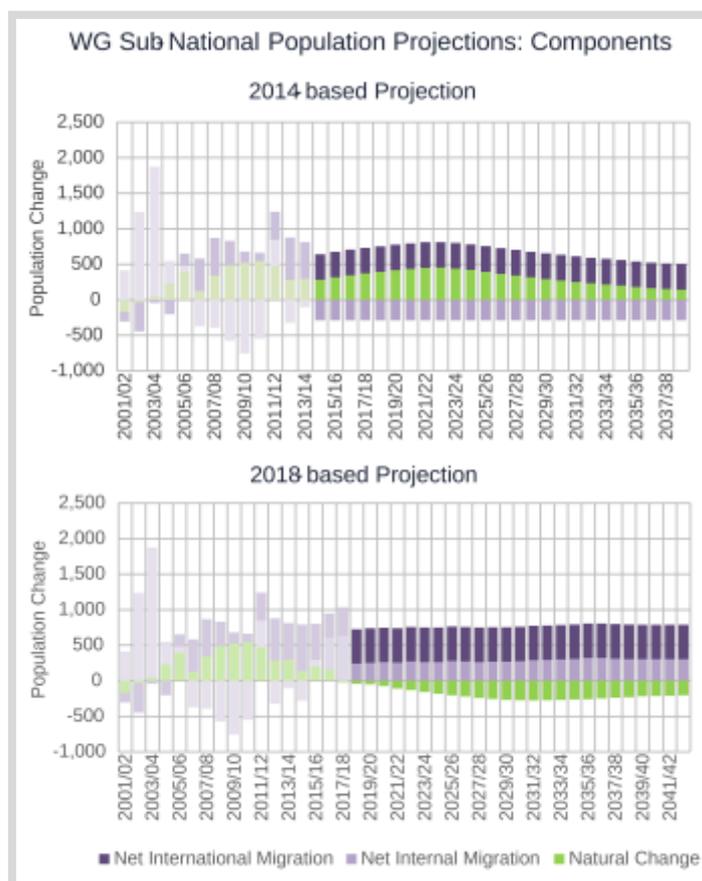
Figure 26: RCT UA – WG official projections: components of change
Source: WG. Note: the projections presented in these charts are for RCT UA.

4.11   The **PG-5Y** and **PG-Long Term** scenarios draw their migration assumptions from a 5-year and 19-year history respectively, with a 2020 MYE base year. Growth is higher under the **PG-5Y** scenario, a reflection of the higher levels of population growth seen in the recent years up to mid-year 2020. Under this scenario, an average dwelling need figure of 682 per annum is identified, along with the highest average employment figure of 446 per year, both linked to high levels of net migration (914 per year).

4.12   The **Dwelling-led 5Y** scenario, continuing the recent history of housing completions (509 dpa), sits in the middle of the range, between the **WG-2018** and **WG-2014** scenarios, estimating a population growth of 2.7%.

Linking Population and Employment

4.13   Figure 27 presents the estimated impact of each demographic scenario upon employment growth within RCT LPA. The relationship between population and employment has been modelled using key assumptions on economic activity rates, unemployment and commuting (see Appendix B).

4.14   Application of these assumptions to each demographic scenario across the 2022–2037 plan period results in a range of employment growth outcomes (Figure 27). The **PG-5Y** scenario, with migration assumptions drawn from a 5-year history, projects the highest level of average employment growth (355 per year), whilst the **WG-2014** scenario presents the lowest average annual employment growth of 12 per year.
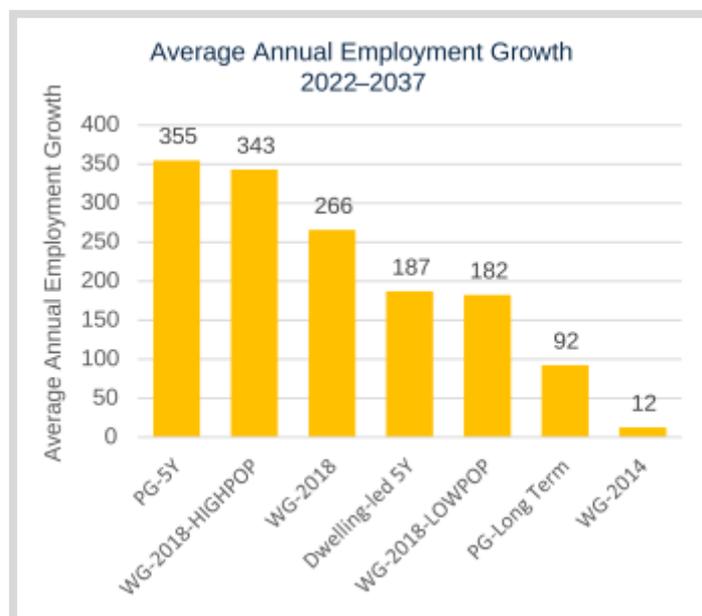
Figure 27: RCT LPA – Average annual employment change, 2022–2037
Source: Edge Analytics POPGORUP modelling

5 Employment-led Scenarios

Scenario Definition

5.1 POPGROUP technology has been used to develop two employment-led scenarios for RCT UA (including the area *within* the BBNP) (Table 4). Further information on POPGROUP methodology, data inputs and assumptions can be found in Appendix B.

5.2 One employment-led scenario is underpinned by the 'people-based' employment forecast from Oxford Economics, whilst the other is underpinned by the Policy-on employment forecast, generated by BE Group. The Policy-on forecast has been derived by adjusting the Oxford Economics forecast, assuming growth in the industrial B2/B8 land use classes.

5.3 In employment-led scenarios, three key assumptions are used to link the annual defined growth in workplace-based employment to population growth: economic activity rates, an unemployment rate and a commuting ratio. Domestic migration is used to balance between population and employment growth; if the resident population is insufficient in size and structure to fill the additional employment, a higher level of net in-migration will result.

5.4 Membership rate, communal establishment and dwelling vacancy assumptions are used to derive the level of household and dwelling growth that could be supported by the resulting population growth trajectory.

5.5 Appendix A provides a summary of the following scenarios, rebased to the 2021 Census population and household figures.

Table 4: Scenario definition

Employment-led OE	Models the population impact of an average annual employment growth of +32 per year for RCT UA, as implied by the Oxford Economics forecast.
Employment-led Policy-on	Models the population impact of an average annual employment growth of +168 per year for RCT UA, based on BE Group's Policy-on adjustments to the Oxford Economics forecasts, assuming growth primarily in the industrial B2/B8 land use classes.

Scenario Outcomes

5.6 The population growth trajectories for the employment-led scenarios, for RCT UA, are presented in Figure 28, from 2001 to 2037. In Table 5, each of the scenarios is summarised in terms of population and household growth for the 2022–2037 plan period, alongside the average annual net migration and associated dwelling and employment growth outcomes.

5.7   It is estimated that population growth of 1.6% would be required to support the employment growth of +32 per year outlined in the **Employment-led OE** scenario, and 3.4% to support the employment growth of +168 per year outlined in the **Employment-led Policy-on** scenario. Over the plan period, this would result in average dwelling growth of 447 dpa and 588 dpa, respectively.
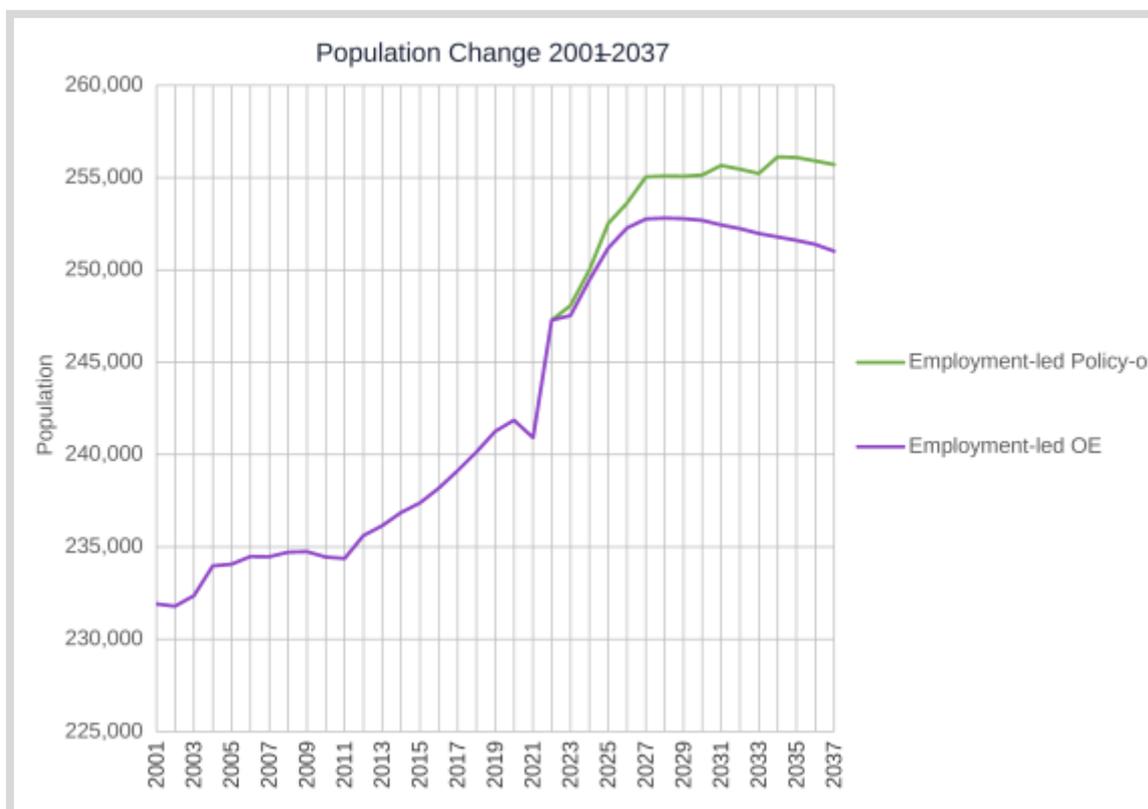
Figure 28: RCT UA – Employment-led scenarios, 2001–2037
Source: Edge Analytics POPGROUP modelling

Table 5: RCT UA – Scenario outcomes, 2022–2037

Scenario	Change 2022–2037				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Employ-ment
Employment-led Policy-on	8,416	3.4%	8,357	7.6%	670	588	168
Employment-led OE	3,725	1.5%	6,348	5.8%	395	447	32

Source: Edge Analytics POPGROUP modelling

6 Summary

Historical Demographic Change

6.1   Between 2001 and 2020, the population of RCT UA grew by 4.3% (ONS MYEs). In terms of the population age structure estimated by the MYEs, the 65–79 and 80+ age groups have seen the largest growth since 2001 in RCT UA. The working age population (16–64) has shown a small level of growth over the historical period, with the 0–15 age group showing a decline.

6.2   Over the last five years, RCT UA's profile of population growth has been characterised by higher net internal in-migration, particularly in the young adult age groups 20–29, drawing attention to the impact of the HELM upon population estimation. Continuous net international in-migration has also had a large influence on population growth across the UA. Natural change has had little impact on population change in recent years, but a large increase in deaths in 2019/20, a result of the COVID-19 pandemic, saw the greatest level of negative natural change since 2001.

6.3   The population of RCT UA at the 2021 Census was 237,700, a 1.4% increase since the 2011 Census. The 2021 Census population is, however, 1.7% *lower* than the ONS 2020 MYE population, highlighting a possible overestimation of the population between the 2011 and the 2021 Censuses, as was seen between the 2001 and 2011 Censuses. Until further evidence is released from the 2021 Census, it is challenging to draw conclusions on the reasons behind the differences between the Census count and the MYEs. The upcoming release of the 2021 MYE and re-based intercensal MYEs will therefore provide an important update to the demographic evidence base, and one that is vitally important for the calibration of demographic growth scenarios.

Growth Outcomes

6.4   POPGROUP technology has been used to configure a suite of demographic growth scenarios for RCT LPA and employment-led scenarios for RCT UA. Under each scenario, population, household, migration, dwelling, and employment growth are presented over a 2022–2037 plan period.

6.5   Over the plan period, population growth of 0.1% to 5.6% is estimated under the range of demographic scenarios (Figure 29). The associated dwelling growth ranges from 353 to 721 dpa. The **PG-5Y** presents a high growth outcome, based on the recent history of migration. In contrast, the **PG-Long Term** scenario projects lower growth, based on a longer history of migration. The **Dwelling-led 10Y** scenario sits in the middle of the range, between the two official principal projections.
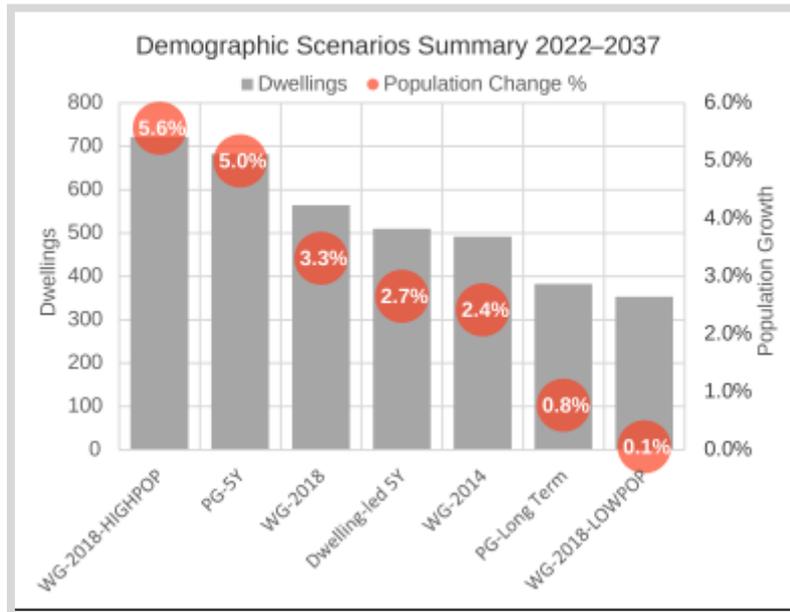
Figure 29: RCT LPA – Demographic scenarios summary, 2022–2037
Source: ONS, Edge Analytics POPGROUP modelling

6.6 The employment-led scenarios, **Employment-led OE** and **Employment-led Policy-on**, estimate population growth of 1.5% and 3.4% over the plan period, with associated dwelling growth of 447 dpa and 588 dpa.
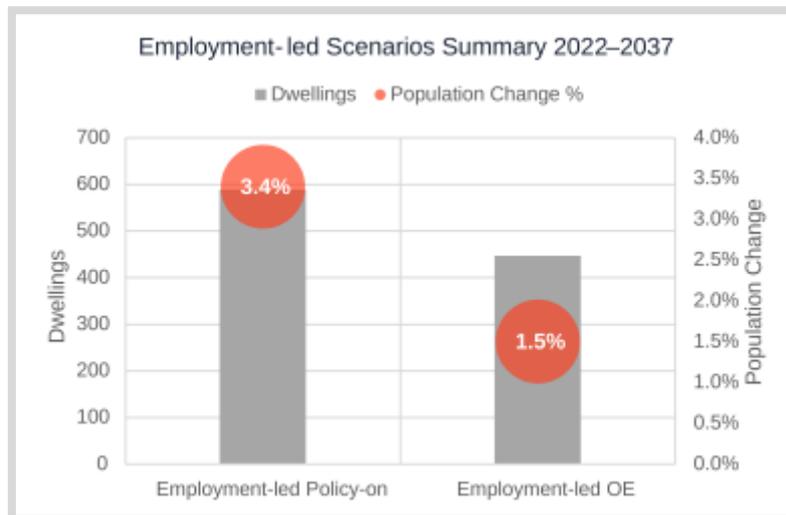
Figure 30: RCT UA – Employment-led scenarios summary, 2022–2037
Source: Edge Analytics POPGROUP modelling

Concluding Comments

6.7 The growth scenarios presented here provide RCT County Borough Council with a range of demographic evidence to inform the development of its RLDP. The scenarios have been formulated using the latest MYE evidence, presenting a range of growth outcomes for the 2022–2037 plan period.

6.8   It is important to note, however, that these scenarios have been developed during a period of unprecedented social and economic upheaval caused by Brexit and the ongoing COVID-19 pandemic, the full impacts of which are not currently fully understood.

6.9   Following the political turbulence of Brexit, the global COVID-19 pandemic resulted in an unprecedented interruption to the daily lives of all UK citizens. The latest 2018-based round of WG projections have introduced a dampened outlook for fertility and morality, with the impact of COVID-19 likely to confirm this in the short-term. At the same time, the future of international migration is highly uncertain due to uncertainty around COVID-19 and the UK's new points-based system for immigration control.

6.10 In June 2022, ONS released the first results from the 2021 Census, which was taken mid-pandemic. Whilst these initial results show how the population of RCT has changed since 2011, the 2021 Census population count is considerably lower than that suggested by the MYE trajectory of growth. The full detailed results from the 2021 Census, which will continue to be released throughout 2023 and beyond, will therefore provide an important update to the demographic evidence base for all local planning authorities, particularly in areas such as RCT where the 2021 Census count is markedly different to the previous MYEs. It is recommended that once this evidence is available, RCT County Borough Council considers the development of a range of demographic scenarios that utilises the revised MYEs, and any updated fertility and mortality assumptions from future subnational population projections.

Appendix A   2021-based Scenarios

Demographic Scenarios

Scenario Definition

To provide an indication of the impact of the initial 2021 Census release on RCT LPA, PG technology has been used to rebase all the scenarios presented in Section 4 to the 2021 Census population and household figures (Table 6).

To generate these scenarios, the 2020 mid-year population has been 'aged on' and rebased to the 2021 Census population, with the households rebased to the 2021 Census household total, providing a consistent (2021) starting point for all scenarios.

Note that in all scenarios, the underpinning growth assumptions are consistent with the scenarios presented in Section 4, as the component of change data required to recalibrate these is not yet available.

In all scenarios, household growth has been estimated using assumptions from the WG 2018-based household projection model, applied from a consistent 2021 base year.

Additional detail on scenario data inputs and assumptions is provided in Appendix B.

Table 6: 2021-based scenario definitions

WG-2014	Replicates the WG 2014-based *Principal* population projection, rebased to the 2021 Census population figure.
WG-2018	Replicates the WG 2018-based *Principal* population projection, rebased to the 2021 Census population figure
WG-2018-HIGHPOP	Replicates the WG 2018-based *High* population projection, rebased to the 2021 Census population figure and incorporating high fertility, mortality and migration assumptions.
WG-2018-LOWPOP	Replicates the WG 2018-based *Low* population projection, rebased to the 2021 Census population figure and incorporating low fertility, mortality and migration assumptions.
PG-5Y	Uses a 2021 Census base year and calibrates its migration assumptions from a 5-year historical period (2015/16–2019/20).
PG-Long Term	Uses a 2021 Census base year and calibrates its migration assumptions from a 19-year historical period (2001/02–2019/20).
Dwelling-led 5Y	Models the population impact of an average annual dwelling growth of +509 dwellings per annum (dpa), based on a 5-year history of housing completions in RCT LPA (2016/17–2020/21).
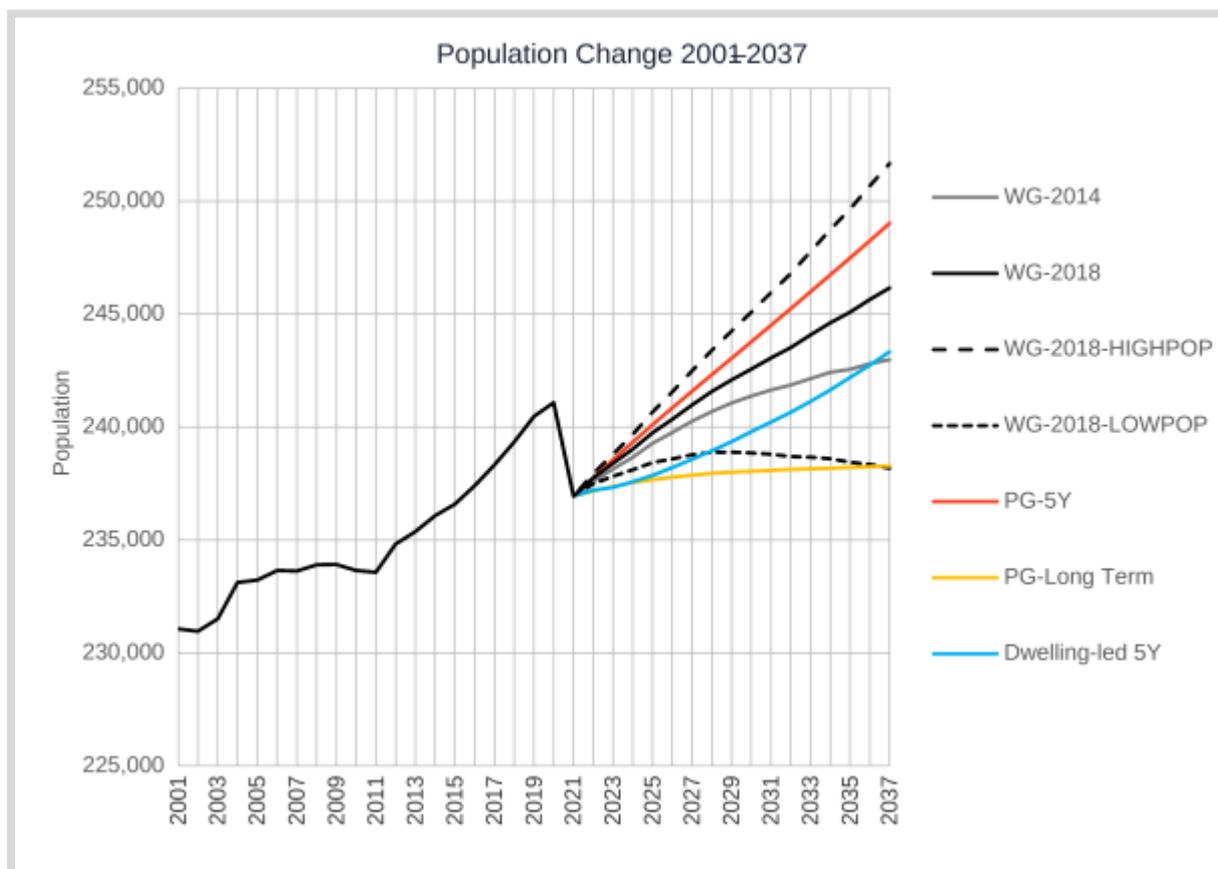
Scenario Outcomes

Figure 31: RCT LPA – 2021–based demographic growth scenarios, 2001–2037
Source: ONS, Edge Analytics POPGROUP modelling

Table 7: RCT LPA – 2021–based scenario outcomes, 2022–2037

Scenario	Change 2022–2037				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Employ-ment
WG-2018-HIGHPOP	13,737	5.8%	10,165	9.8%	945	716	349
PG-5Y	11,270	4.7%	9,257	8.9%	914	652	315
WG-2018	8,417	3.5%	8,038	7.8%	788	566	274
Dwelling-led 5Y	6,134	2.6%	7,234	7.0%	630	509	161
WG-2014	5,379	2.3%	6,579	6.3%	181	463	15
PG-Long Term	1,123	0.5%	5,118	4.9%	336	360	55
WG-2018-LOWPOP	691	0.3%	5,155	5.0%	632	363	193

Source: ONS, Edge Analytics POPGROUP modelling

Employment-led Scenarios

Scenario Definition

Using the same methodology as the demographic scenarios, PG technology has been used to rebase the employment-led scenarios (presented in Section 5) to the 2021 Census population and household figures, providing an indication of the impact of the initial 2021 Census release on RCT UA (Table 8).

Additional detail on scenario data inputs and assumptions is provided in Appendix B.

Table 8: 2021-based scenario definitions

Employment-led OE	Models the population impact of an average annual employment growth of +32 per year for RCT UA, as implied by the Oxford Economics forecast.
Employment-led Policy-on	Models the population impact of an average annual employment growth of +168 per year for RCT UA, based on BE Groups policy-on adjustments to the Oxford Economics forecasts, assuming growth primarily in the industrial B2/B8 land use classes.

Scenario Outcomes

Figure 32: RCT UA – 2021-based employment-led scenarios, 2001–2037
Edge Analytics POPGROUP modelling

Table 9: RCT UA – 2021–based scenario outcomes, 2022–2037

Scenario	Change 2022–2037				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Employ-ment
Employment-led Policy-on	8,863	3.6%	8,486	8.0%	728	598	168
Employment-led OE	4,166	1.7%	6,506	6.1%	452	458	32

Source: Edge Analytics POPGROUP modelling

Appendix B
POPGROUP Methodology & Assumptions

POPGROUP

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 33) is a 'cohort component' model, which enables the development of population forecasts based on births, deaths and migration inputs and assumptions.
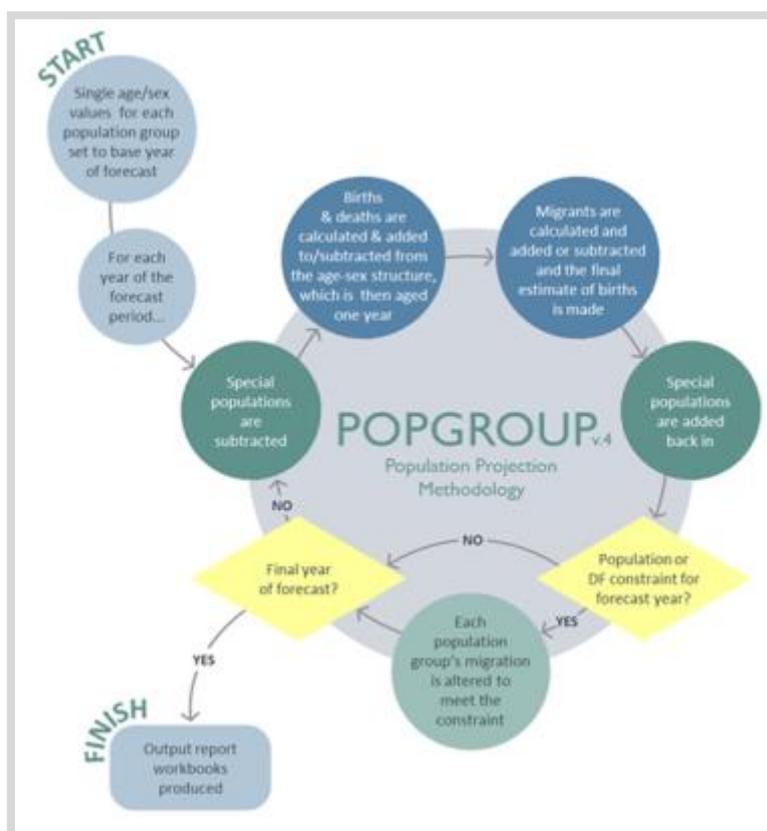
Figure 33: POPGROUP population projection methodology

The Derived Forecast (DF) model sits alongside the population model (Figure 34) providing a membership rate model for household projections and an economic activity rate model for labour force and employment projections.

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

D	Derived Category Forecast	y	Year
P	Population 'at risk' Forecast	d	Derived category
R	Derived Category Rates	g	Group (usually an
a	Age-group		area, but can be an
s	Sex		ethnic group or
u	Sub-population		social group)
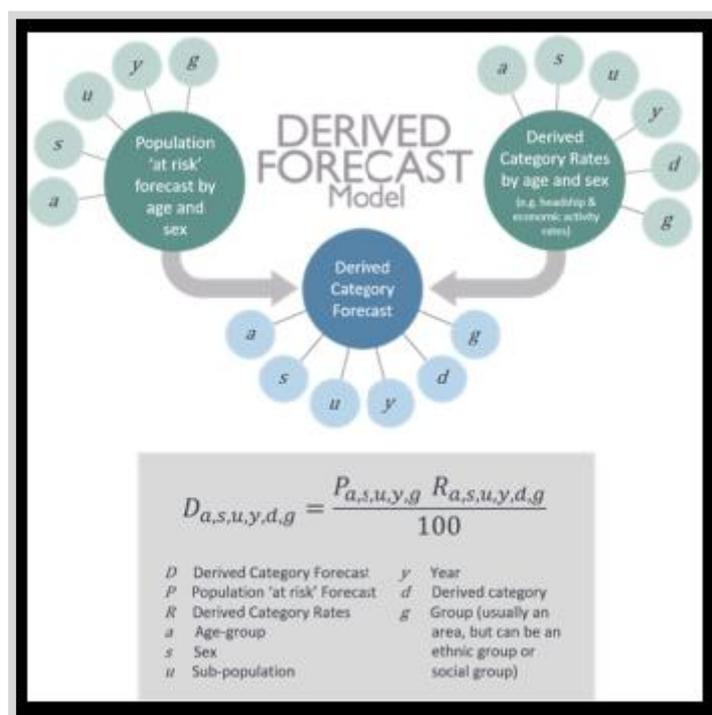
Figure 34: Derived Forecast (DF) methodology

Scenario Inputs & Assumptions

Population

Historical population statistics are provided by ONS mid-year population estimates (MYEs), with all data disaggregated by single year of age and sex. MYEs are used up to the respective base years of each scenario. From the base year onwards, future population counts are estimated by single year of age and sex, using the assumptions outlined below. The **WG** scenarios use the MYEs up until the respective 2014 and 2018 base years. The **PG**, **Dwelling-led** and **Employment-led** scenarios use the ONS 2020 MYE as their base year.

In the 2021-based scenarios, historical population statistics are drawn from the ONS 2001–2020 MYEs and the initial 2021 Census results. The MYE data are disaggregated by single year of age and sex. ONS has published an initial Census population by 5-year age group and sex, rounded to the nearest 100. This population has been disaggregated by single year of age and sex using the age-sex structure aged on from the 2020 MYE. From the 2021 base year onwards, future population counts are estimated by single year of age and sex, using the assumptions outlined below. Note that as no MYE data is available for 2020/21, all scenario assumptions are derived.

Births & Fertility

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

Under the **WG** scenarios, historical counts of births have been used up until each scenario's base year. The future counts of births are reproduced from the base year onwards to ensure consistency with the respective official projection.

For the **PG**, **Dwelling-led** and **Employment-led** scenarios, birth counts are applied 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 sub-national population projection (SNPP). 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 of the forecast period.

Deaths & Mortality

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 counts of deaths have been used up until each scenario's base year. The future counts of deaths are reproduced from the base year onwards to ensure consistency with the respective official projection.

For the **PG**, **Dwelling-led** and **Employment-led** scenarios, counts of deaths by age and sex are applied 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 SNPP. In combination with the 'population-at-risk' (i.e. all population), these ASMR assumptions provide the basis for the calculation of deaths in each year of the forecast period.

Migration – RCT LPA

In the demographic scenarios configured for RCT LPA, migration is calculated as the 'residual' of the population after taking account of births and deaths. 'Net migration' equates to the cumulative impact of the four types of migration modelled within POPGROUP (in-migration, out-migration, immigration and emigration).

2011 Census statistics are used to derive historical migration estimates for RCT LPA by comparing the migration implied by the schedule of rates for all areas (in this case, the schedule from the WG 2018-based projection for RCT UA) with the pattern of migration observed for RCT LPA in the 2011 Census statistics.

Once the historical estimates have been derived, a weighted average of the last five years (2015/16–2019/20) of estimated migrant counts is used directly as input to scenario forecasts. The weighted average, calculated for each age-sex category and separately for each of the four migration flows, is repeated for each year of the scenario projection up to and including the last year. Under the **PG-Long Term** scenario, historical estimates of migration have been derived from the last nineteen years (2001/02–2019/20) of estimated migration counts.

The **Dwelling-led** scenario calculates its own migration assumptions to ensure an appropriate balance between the population and the targeted increase in the number of new dwellings in each year of the forecast period. A higher level of migration will occur if there is insufficient population to meet the

forecast dwelling target. The profile of migrants is defined by and age-specific ASMigR schedule derived using a weighted average of the last five years (2015/16–2019/20) of estimated migrant counts.

Internal Migration – RCT UA

Under the **Employment-led** scenarios for RCT UA, 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.

Future internal migration rate assumptions have been derived from a five-year historical period, with the level of internal migration altered by the model to meet defined annual employment growth targets.

International Migration – RCT UA

Under the **Employment-led** scenarios for RCT UA, historical 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.

Future international migration assumptions are derived from a five-year historical period.

Households & Dwellings

The 2011 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".

In POPGROUP, a dwelling is defined as a unit of accommodation which can either by occupied by one household or can be vacant.

The household and dwelling growth implications of each scenario are estimated through the application of communal population statistics, household membership rates and a dwelling vacancy rate. These assumptions have been sourced from the 2011 Census, and the WG 2018-based household projection model. In a **Dwelling-led** scenario, these assumptions are used to derive the level of population growth required to meet the defined dwelling-growth target.

In the 2021-based scenarios, the household forecasts have been rebased to the 2021 Census household figure.

Household Membership Rates

Membership rates are used to calculate the proportion of the household population in each household category by age group and sex (Table 10), taken from the WG 2018-based household model for RCT UA. The household population is then converted into households using average household size assumptions, drawn from the household model.

Table 10: WG 2018-based household categories

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)

Source: WG

Communal Population Statistics

Household projections in POPGROUP exclude the population 'not-in-households' (i.e. the communal/institutional population). These data are drawn from the WG 2018-based household projections. Examples of communal establishments include prisons, residential care homes and student halls of residence.

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

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 5.3% for RCT UA has been applied and fixed throughout the forecast period. Using this vacancy rate, the number of dwellings needed to meet the household growth trajectory has been estimated.

Labour Force & Employment

The labour force and employment growth implications of each scenario are estimated through the application of economic activity rates, an unemployment rate and a commuting ratio.

Economic Activity Rates

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 (16–89) and sex have been derived from 2011 Census statistics, with adjustments made in line with the OBR analysis of labour market trends in its 2018 Fiscal Sustainability Report[12].

Commuting Ratio

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.

According to the 2011 Census, the number of resident workers in RCT UA was approximately 99,690, with the number of people employed in the area at 82,446. This results in a commuting ratio of 1.21, a net out-commute, which has been applied in all scenarios and fixed throughout the forecast period.

Unemployment

The unemployment rate is the proportion of unemployed people within the economically active population. For the demographic scenarios, historical unemployment rates have been sourced from ONS model-based estimates. The ONS 2021 rate of 3.9% for RCT UA has been applied and fixed throughout the forecast period.

Under the **Employment-led** scenarios, unemployment rates from the Oxford Economics forecast for RCT UA have been applied.

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[12] OBR Fiscal Sustainability Report, July 2018

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