Telford & Wrekin

Housing & Demographics

September 2020

edge analytics

Nexus | Discovery Way | University of Leeds | Leeds | LS2 3AA
0113 819 5087 | www.edgeanalytics.co.uk

Acknowledgements

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Contents

1 Introduction

Context

1.1 Telford & Wrekin Council has commissioned a joint Economic and Housing Development Needs Assessment (EHDNA) for the Borough, developing a suite of evidence for a 2020–2040 plan-period that informs the following:

- The review of the Telford & Wrekin Local Plan
- The development of the Council's Economic and Housing Strategy including the Joint Strategic Needs Assessment and Health & Well Being Strategy
- The identification of current and future economic and housing needs, including affordable and specialist housing and their inter-relationships

1.2 A key component of the EHDNA is the formulation of a range of demographic evidence, combining information on population, household and employment growth for the 2020–2040 forecast horizon. This report and accompanying datasets provide the demographic evidence that feed directly into the full EHDNA Final Report.

Approach

1.3 Edge Analytics is a specialist in Data Science, applying a combination of research, data, technology and analytical models to generate insight that better informs business planning and decision-making. Edge Analytics has a particular expertise in demographic modelling and forecasting and has worked with local planning authorities across the UK in the development and presentation of evidence to support Local Plan formulation.

1.4 POPGROUP technology has been used to configure a range of growth scenarios for Telford & Wrekin, including official projections from the Office for National Statistics (ONS), alternative trend scenarios, plus employment-led and dwelling-led forecasts. In each of the scenarios, historical data is included for the period between 2001–2019, providing the baseline for growth forecasts over a 2020–2040 plan period.

1.5 The scenario analysis is prefaced with a demographic profile of Telford & Wrekin Unitary Authority (UA). Section 2 illustrates the Borough's geographical context, growth profile and components of population change, plus its historical patterns of international and domestic migration. Section 3 extends the analysis with an examination of the patterns and trends in demographic change that have affected eight sub-Borough geographies since 2001.

1.6 Section 4 presents a suite of growth outcomes for Telford & Wrekin. Population, household, dwelling and employment growth outcomes are considered, including the effect of a return to higher rates of household formation amongst the young adult population.

1.7 Section 5 concludes the analysis with a summary of findings.

1.8 Appendix A and B detail the data and assumptions used in the formulation of the analysis.

2 Area Profile – Telford & Wrekin

Population Change

2.1 Telford & Wrekin UA is situated to the North-West of the West Midlands conurbation, bordering Shropshire to the North, West and South, plus Stafford and South Staffordshire to the east (Figure 1).

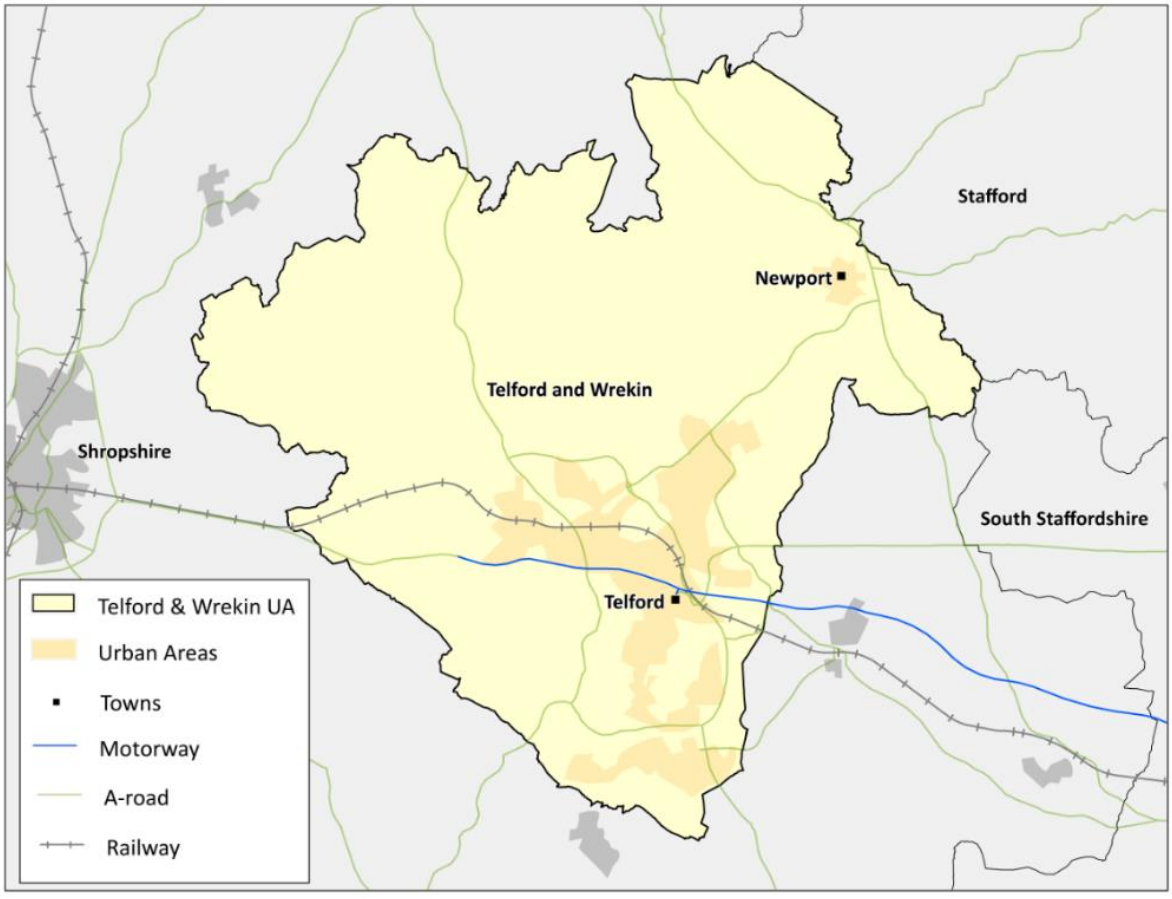

Figure 1: Telford & Wrekin UA

2.2 As of mid-year 2019, Telford & Wrekin's population was estimated by ONS to be 179,854, rising from 158,573 in 2001, a 13.4% increase (Figure 2).

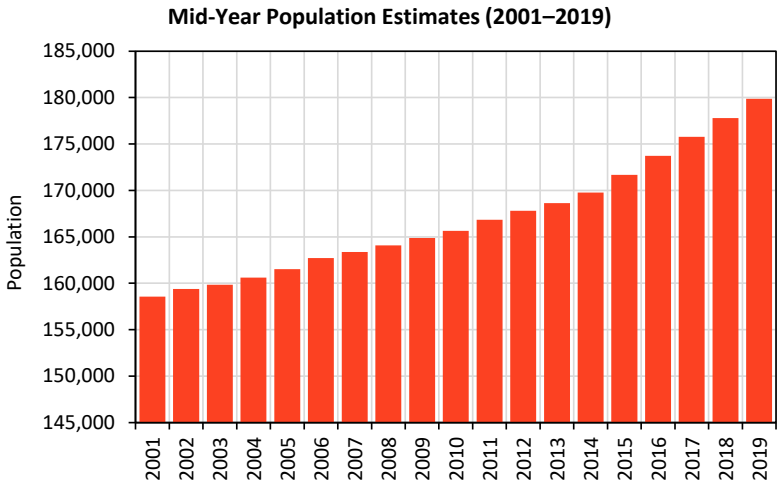

Figure 2: Telford & Wrekin Mid-Year Population Estimates 2001-2019 (Source: ONS)

2.3 In terms of Telford & Wrekin's annual population change, each year since 2001 has seen growth, with relative stability in 2001-2014. A sharp increase in the growth rate is evident since 2014/15, with an annual population growth in excess of 2,000 in the last four years of ONS evidence (Figure 3).

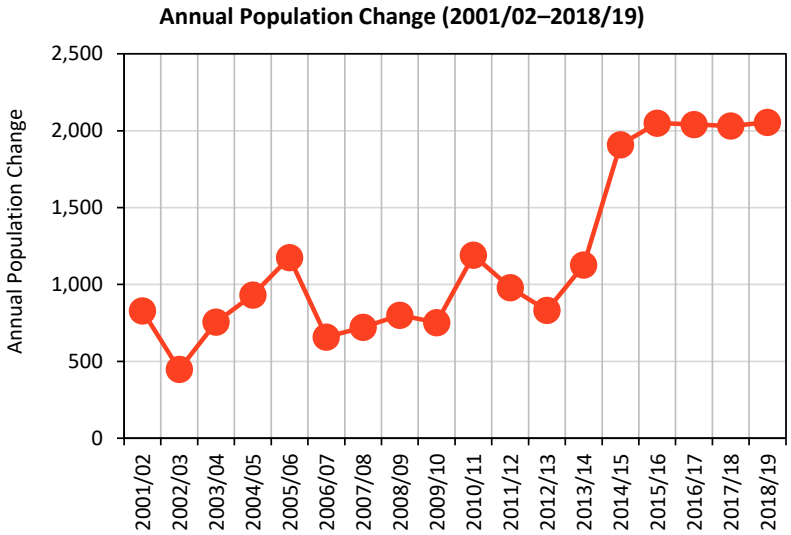

Figure 3: Telford & Wrekin Annual Population Change 2001/02-2018/19 (Source: ONS)

2.4 The Borough's population growth has responded to the fluctuations in housing delivery rates. Completion rates averaged just over 400 dwellings per annum (dpa) to 2013/14. In contrast, the last five years has seen housing growth in excess of 1,000 dpa, reaching a peak of +1,350 in 2018/19 (Figure 4).

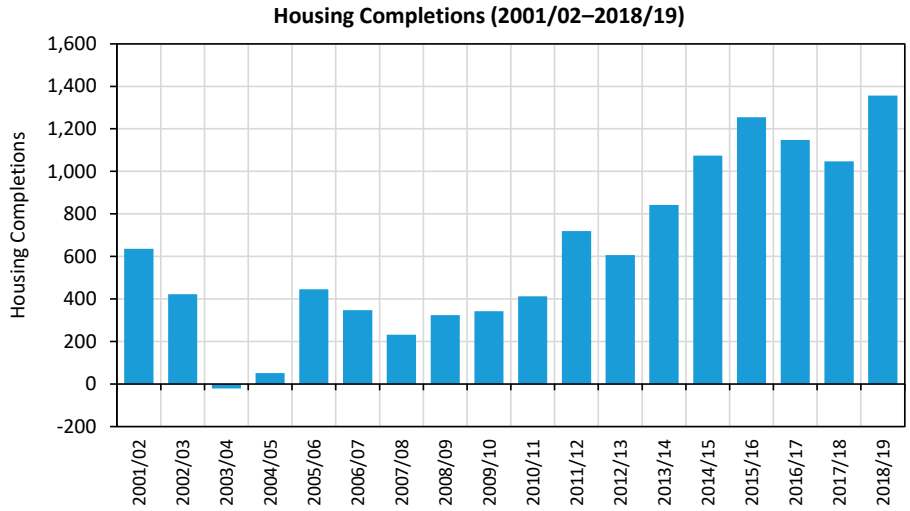

Figure 4: Telford & Wrekin Housing Completions 2001-2019 (Source: MHCLG)

Births, Deaths & Migration

2.5 Examination of the 'components' of population change for Telford & Wrekin, indicates an upward adjustment (unattributable population change) to the district's population following the 2011 Census (Figure 5). Population growth due to net natural change (the difference between births and deaths) has remained positive over the 2001–2019 period, contributing an average of approximately +730 per year to population growth, lower since 2014/15. International migration has also made a positive contribution to Telford & Wrekin's population growth, in all years since 2004/05.

2.6 The annual impact of internal migration (migration between Telford & Wrekin and the rest of the UK) upon population growth has been more variable. A net outflow (higher out-migration than in-migration) was characteristic of the growth profile to 2013/14. Since 2014/15, a positive internal net migration balance has made a significant contribution to population growth, over +950 per year.

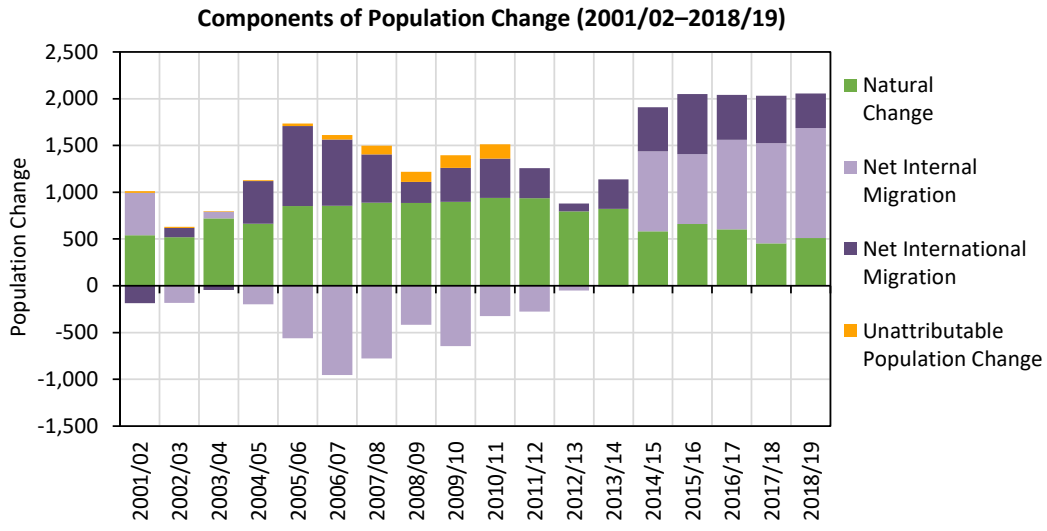

Figure 5: Telford & Wrekin Components of Population Change 2001/02-2018/19 (Source: ONS)

2.7 Birth totals for Telford & Wrekin peaked in 2010/11, declining thereafter (Figure 6). With a steady fall in the birth total since 2010/11 and a corresponding rise in the number of deaths since 2013/14, the impact of natural change upon annual population growth has reduced.

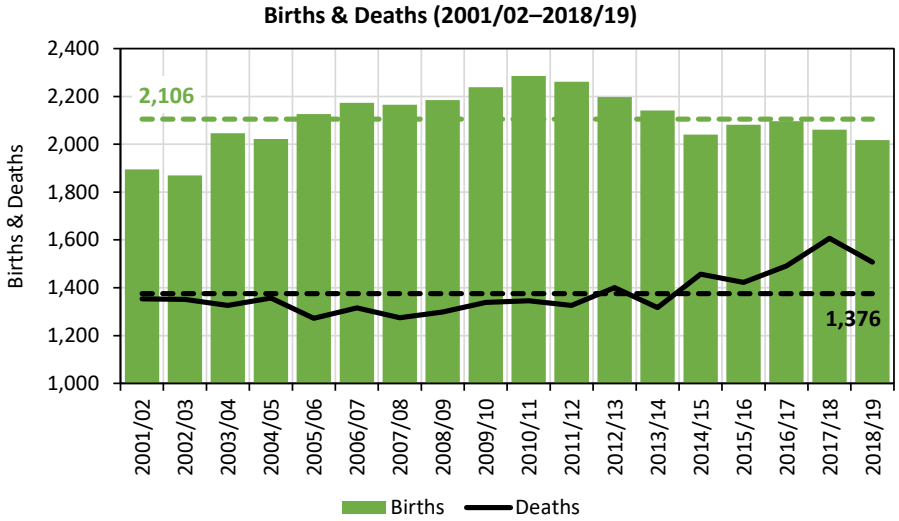

Figure 6: Telford & Wrekin Birth and Death profile 2001/02-2018/19 (Source: ONS)

2.8 A more detailed scrutiny of internal migration statistics reveals that *outflows* from Telford & Wrekin and the rest of the UK have remained relatively stable between 2001–2016. In 2014/15, *inflows* into the district exceeded *outflows* for the first time since 2001/02, whilst the overall annual net inflow has subsequently increased to a peak of over +1,150 in 2018/19 (Figure 7). There is a more prominent increase in both *inflows* and *outflow* in 2016/17, which aligns with the methodological change implemented by ONS in its population estimation process, redistributing student numbers based on historical patterns, post-graduation.

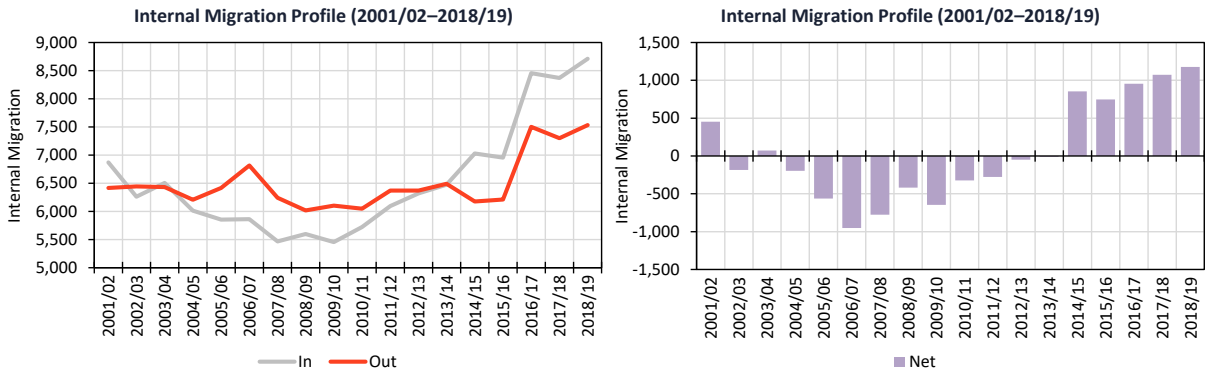

Figure 7: Telford & Wrekin Internal Migration profile 2001/02-2018/19 (Source: ONS)

2.9 Telford & Wrekin's most significant net migration *inflows* originate from Wolverhampton and from a series of other districts in the West Midlands. In contrast, its net migration *outflow* is overwhelmingly associated with the Shropshire UA (Figure 8).

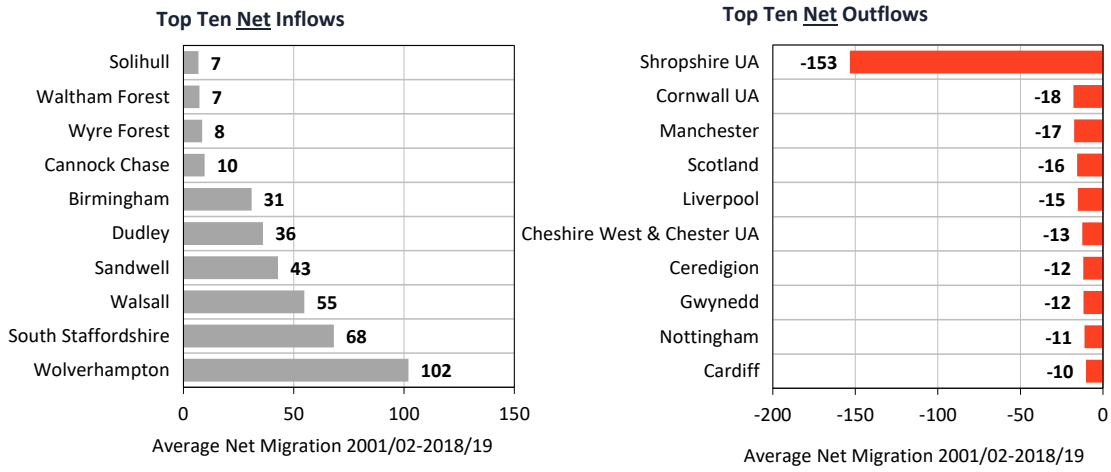

Figure 8: Telford & Wrekin Internal Migration exchanges 2001–2019 (Source: ONS)

2.10 The age profile of migration drawn from the full 2001–2019 historical time-series, indicates a dominant *outflow* in the 15-29 age-groups, usually associated with migration for higher education and employment (Figure 9). The largest net inflows have been in the family age groups, 0-14 and 30-44, and in the 75+ age-group.

2.11 Considering just the last five years of internal migration data evidence, during which the net inflow has been high, the average outflow has reduced among the young adult age groups, increasing to a net inflow in the 25-29 age group. Net inflow across the remainder of age groups has increased significantly, driving Telford & Wrekin's population growth since 2014/15.

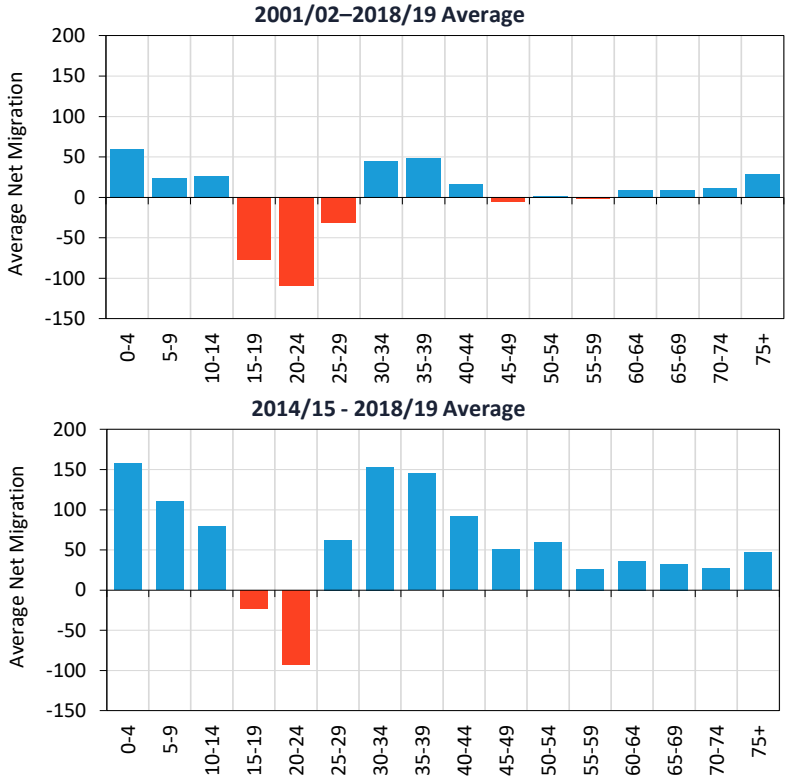

Figure 9: Internal Migration Age Profile (Source: ONS)

2.12 International migration has been a relatively consistent contributor to population growth in Telford & Wrekin since 2001. In the last four years of evidence, migration from overseas was estimated to increase the population by an average of +525. National Insurance Number (NINo) statistics provide a complementary illustration of international migration inflow to Telford & Wrekin (Figure 10).

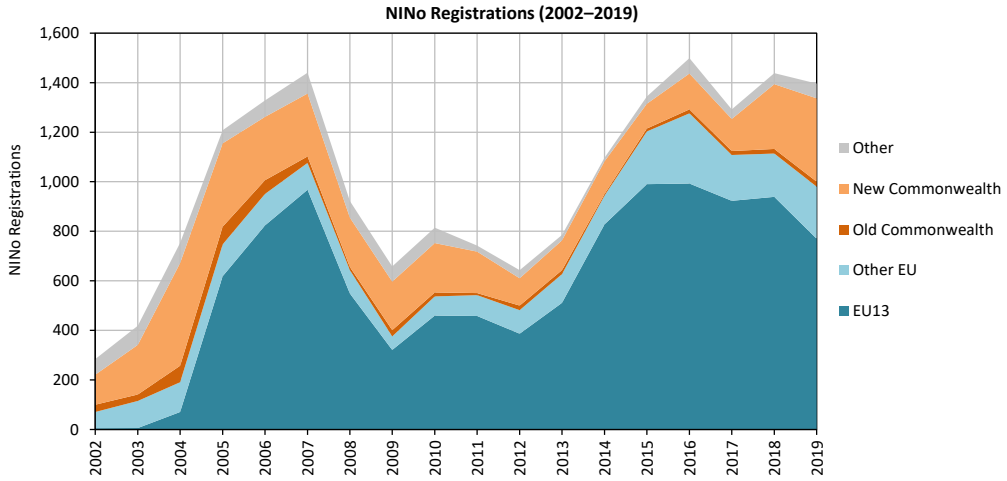

Figure 10: Telford and Wrekin NINo registrations by country of origin 2002-2019 (Source: DWP)

2.13 NINo statistics record the registration of migrants as they arrive to work in the UK. The sharp increase in registrations from the EU13[1] from 2013/14 were predominantly from Romania and Bulgaria, following removal of restrictions on their freedom of movement between EU member states. Annual registrations from Romania rose sharply from 2014, reaching a peak of over 400 registrations in 2017. Registrations from Bulgaria followed a similar trend, albeit peaking at a lower figure of approximately 150 registrations in 2018. Total NINo registrations have fluctuated around +1,300 per year since 2014.

Population Age Profile

2.14 Telford & Wrekin's population has grown or has remained stable in the majority of age-groups since 2001, but its profile is demonstrating a rapid process of 'ageing' as the birth cohorts of the 1950s and 1960s move through the population (Figure 11).

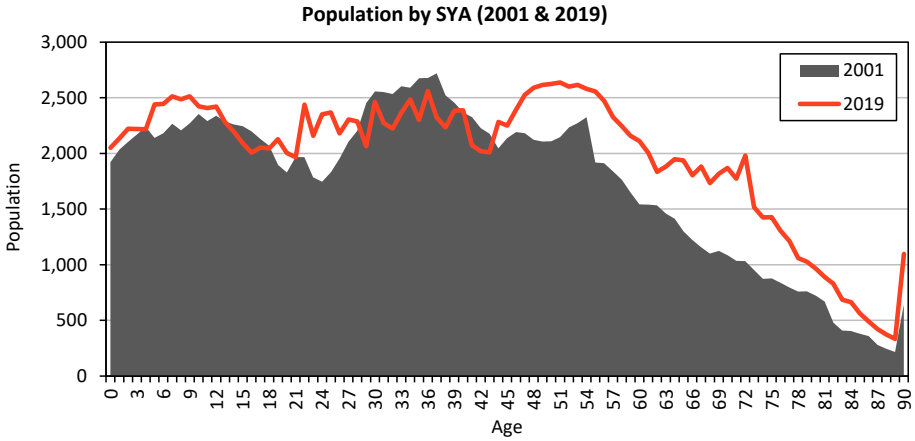

Figure 11: Telford & Wrekin Population by Single Year of Age in 2019 compared to 2001 (Source: ONS)

[1] New EU member states since 2004

2.15 Figure 12 illustrates growth in all age groups over the 2001–2019 period, despite initial falls in the number of 0-15 year olds. The number of over-65s and over-80s have increased by over 50% since 2019.

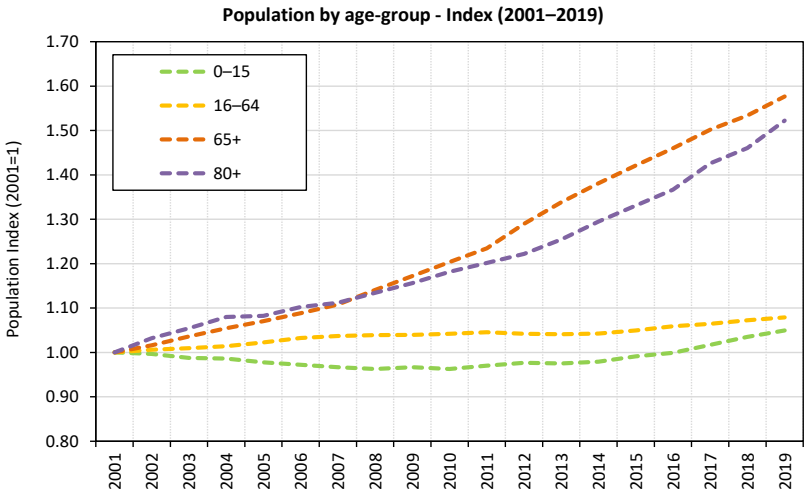

Figure 12: Telford & Wrekin population growth by age-group 2001–2019 (Source: ONS)

Income Profile

2.16 Evidence on the relative levels of income across Telford & Wrekin's communities is provided by the Index of Multiple Deprivation (IMD)[2]. The IMD presents statistics for Lower Super Output Areas (LSOAs), of which there are 108. Each LSOA is given a 'rank' based upon its estimated level of income deprivation and allocated to one of ten deciles. The chart below indicates that 10% of England's LSOAs are in each decile, providing the benchmark for comparison with Telford & Wrekin's LSOAs (Figure 13)

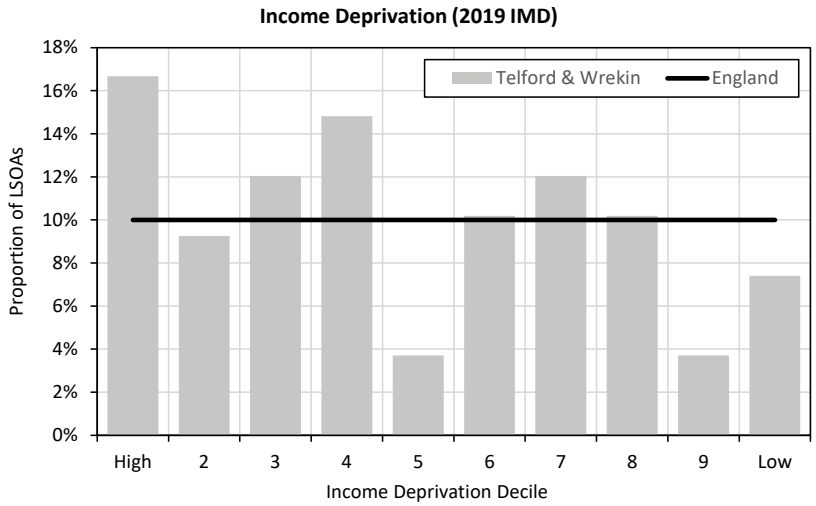

Figure 13: Telford & Wrekin – LSOA Income Deprivation Deciles (Source: MHCLG)

[2] The 2019 Index of Multiple Deprivation (IMD 2019), is the official measure of relative deprivation in England, assigning a rank (1-32,844) and decile (1-10) to every lower super output area (LSOA) according to seven deprivation domains. Decile 1 refers to the most deprived 10% of LSOAs. Decile 10 refers to the least deprived 10%.
https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

2.17 Telford & Wrekin has a relatively large number of LSOAs in the Highest income deprivation categories, with 61 of the 108 LSOAs in the 1-5 deciles, and over 16% of all its LSOAs in the High (1) decile. These are clustered in the south-east of the district, within and around Telford. Newport, together with the larger, more rural areas of the borough have the lowest levels of income deprivation (Figure 14).

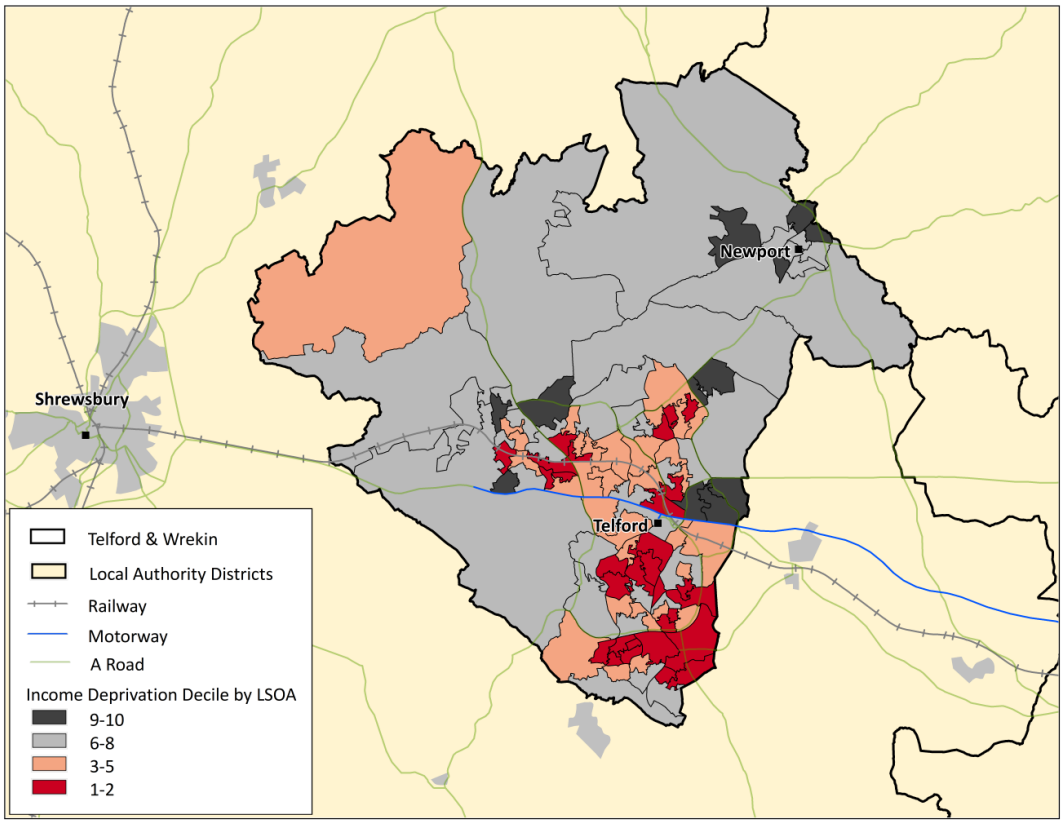

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Figure 14: Telford & Wrekin – LSOA Income Deprivation (Source: MHCLG)

3 Sub-Borough Demographics

3.1 The Council has identified eight sub-Borough geographies for consideration in the formulation of demographic and economic evidence. Seven of these geographies encompass the main urban areas of Telford plus Newport, with an eighth area encapsulating the remaining rural geography (Figure 15).

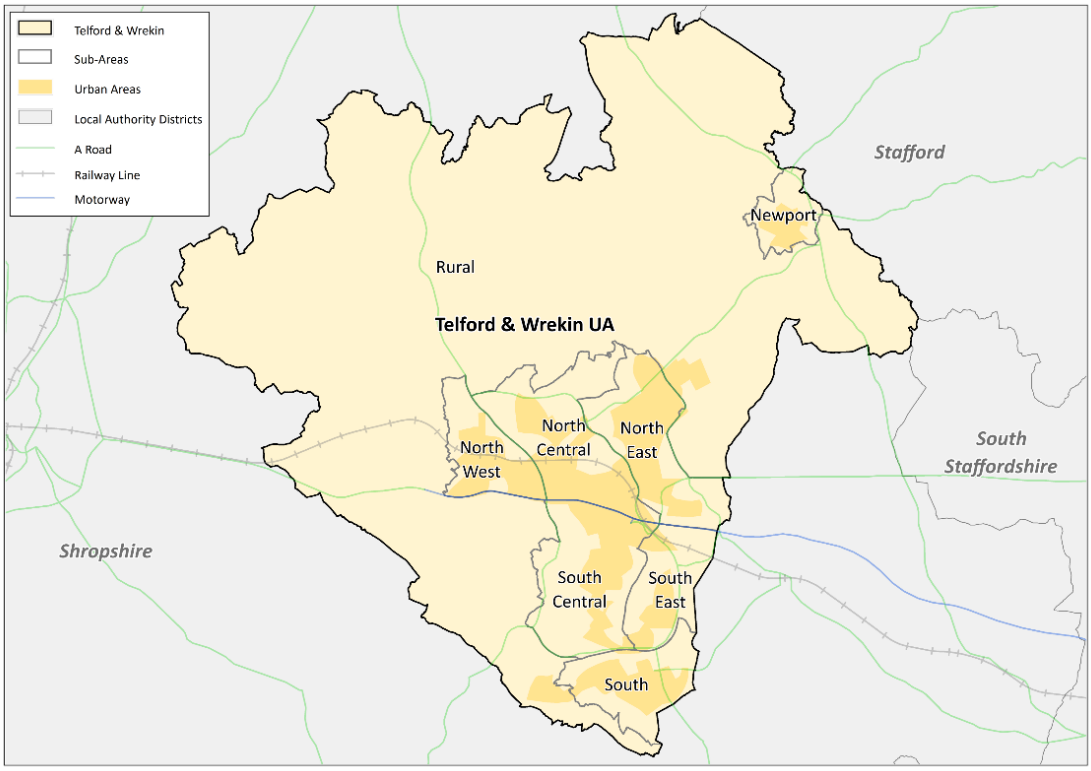

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Figure 15: Telford & Wrekin – Sub-Borough area definition

3.2 There has been considerable variation in the growth profile of these areas since 2001 (Table 1).

Table 1: Telford & Wrekin Sub-Borough Population Change 2001-2018 (Source: ONS)

Area Name	Mid-Year Population		Population Change (2001–2018)	
	2001	2018	Total	%
South Central	23,153	29,681	6,528	28%
North Central	22,105	26,824	4,719	21%
Newport	10,909	12,227	1,318	12%
Rural	20,675	23,138	2,463	12%
North East	26,606	28,621	2,015	8%
North West	20,438	21,940	1,502	7%
South	17,974	18,613	639	4%
South East	16,713	16,755	42	0%
Telford & Wrekin	**158,573**	**177,799**	**19,226**	**12%**

3.3 With an average growth of 12% (2001–2018), population change has ranged from 28% in South Central to virtually no change in the South East. In descending order of growth, the components of change associated with each of the eight areas is illustrated[3] (Figure 16).

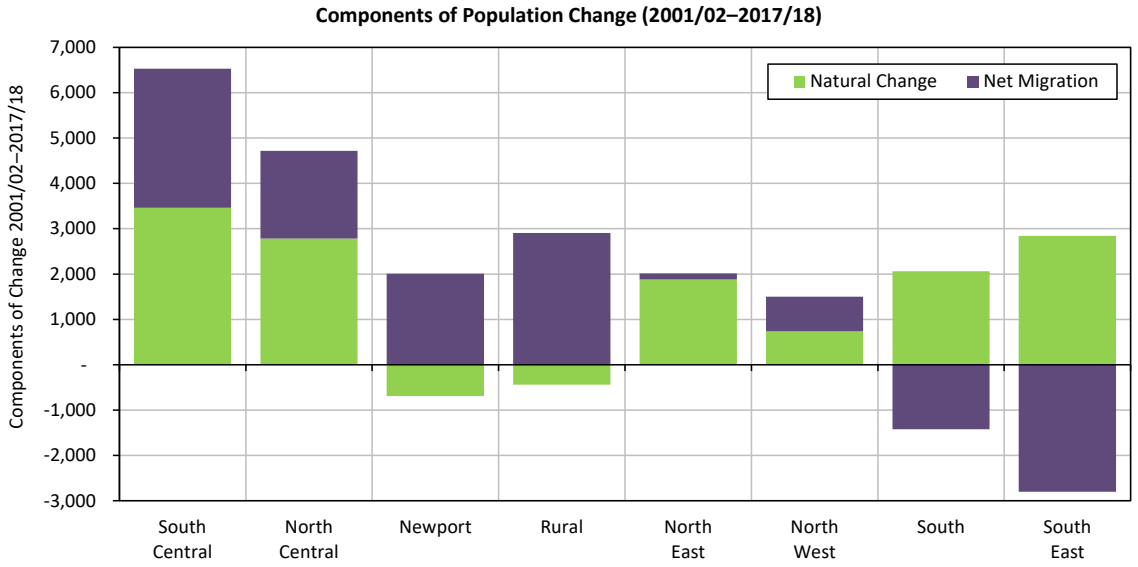


Figure 16: Telford & Wrekin – sub-Borough areas Components of Change 2001/02-2017/18

3.4 This perspective on the components of population change aggregates data across all years 2001–2018. An accompanying illustration illustrates how components of change have varied year-on-year for each of the eight areas (Figure 17).

3.5 The high growth experienced in South Central and North Central has been due to a mix of natural change (more births than deaths) and net inward migration. In both areas, growth has been concentrated in the later years of the historical time-series, a likely reflection of housing growth concentrations.

3.6 In contrast, the South and the South East areas have experienced positive growth from natural change over the 18-year time-series but a net loss through migration. In both areas, this pattern was consistent in all years to 2013/14. Thereafter, some migration effects have been experienced, in all years since 2014/15 in the case of the South.

3.7 The changing impact of Telford & Wrekin's ageing population is best illustrated in the Newport and Rural geographies. Natural change has resulted in a net loss of population in both areas between 2001–2018. An excess of deaths over births is most noticeable in the last five years as fertility rates have declined whilst death numbers have increased.

[3] No distinction between internal and international migration is available for sub-Borough geographies.

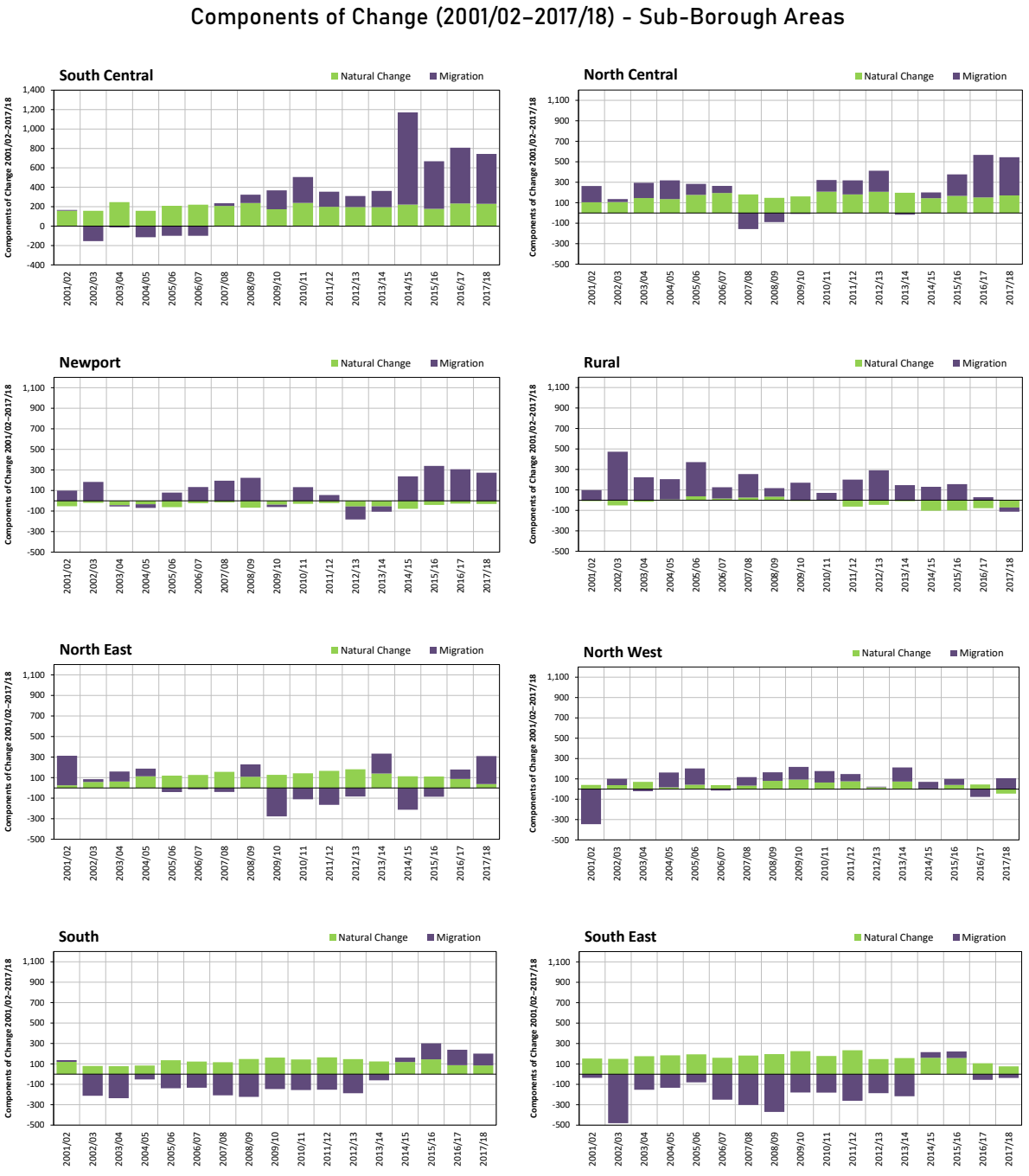


Figure 17: Telford & Wrekin Sub-Borough areas: Components of Change 2001/02-2017/18

4 Demographic Scenarios

Scenario Definition

4.1 POPGROUP technology (see Appendix A) has been used to configure a suite of growth scenarios for Telford & Wrekin. Additional detail on scenario data inputs and assumptions is provided in Appendix B.

4.2 ONS scenarios include the 2014-based and 2016-based 'principal' projections, plus an extended suite of variants that make up the 2018-based ONS projections (Table 2).

4.3 POPGROUP (PG) trend scenarios incorporate a **2019** base year and consider the growth outcomes based on a continuation of short-term and long-term migration histories, and an annual 'zero' net migration balance.

4.4 The employment-led scenarios consider the relationship between future employment growth and demographic change, incorporating key assumptions on economic activity rates, an unemployment rate and a commuting ratio, with a **2019** base year (see Appendix B for detail on the annual employment growth applicable to each employment-led scenario).

4.5 The dwelling-led scenarios consider the relationship between future dwelling growth and demographic change, using key assumptions on household representative rates, communal population statistics and a dwelling vacancy rate, with a **2019** base year.

4.6 Under each scenario, population, household, migration, dwelling and employment growth is presented over a 2020–2040 plan period, in line with Telford and Wrekin's planning horizon.

4.7 For all scenarios, household and dwelling growth is estimated using assumptions from the MHCLG's 2014-based household projection model. An additional headship rate sensitivity (**2014-based Return**) has been applied to all scenarios, which considers the impact of higher household formation in the young adult age-groups. The household headship rates for the 25–34 age-group have been 'returned' to their respective 2001 values over the 2020–2039 period.

4.8 In modelling the relationship between households and dwellings, a Telford & Wrekin vacancy rate of 3.1% has been applied, derived from 2011 Census statistics.

Table 2: Scenario Definition

1.	SNPP 2014-based	This scenario replicates the ONS 2014-based SNPP, using historical population evidence for 2001–2014.
2.	SNPP 2016-based (Principal)	This replicates the ONS 2016-based SNPP Principal Scenario, using historical population evidence for 2001–2016.
3.	SNPP 2018-based (Principal)	This replicates the ONS 2018-based SNPP Principal Scenario, using historical population evidence for 2001–2018.
4.	SNPP 2018-based (Higher Variant)	This replicates the ONS 2018-based SNPP Higher Migration Scenario, using historical population evidence for 2001–2018. This variant assumes higher levels of net international migration.
5.	SNPP 2018-based (Lower Variant)	This replicates the ONS 2018-based SNPP Lower Migration Scenario, using historical population evidence for 2001–2018. This variant assumes lower levels of net international migration.
6.	SNPP 2018-based (Alternative Variant)	This replicates the ONS 2018-based SNPP Alternative Internal Migration Scenario, using historical population evidence for 2001–2018. This variant uses five years of internal migration data to inform the projection, two years using ONS' new estimation methodology and three years using its previous methodology.
7.	SNPP 2018-based (10 year Variant)	This replicates the ONS 2018-based SNPP Alternative Internal Migration Scenario, using historical evidence for 2001–2018. This variant uses 10 years of all migration data to inform the projection.
8.	PG Short Term	This scenario uses an ONS 2019 base year and calibrates its migration assumptions from a six-year history (2013/14–2018/19).
9.	PG Long Term	This uses an ONS 2019 base year and calibrates its migration assumptions from an eighteen-year history (2001/02–2018/19).
10.	PG Zero	This scenario models the population growth implications of an annual 'zero' net-migration balance in the Borough.
11.	Employment-led Experian	Models the population impact of an average annual employment growth of +700 per year over the plan period, detailed in an Experian economic forecast.
12.	Employment-led Experian Growth	Models the population impact of an average annual employment growth of +859 per year, based on an uplift to the Experian forecast.
13.	Employment-led OE	Models the impact of an average annual employment growth of -46 per year, detailed in an Oxford Economics (OE) forecast.
14.	Employment-led Cambridge	Models the impact of an average annual employment growth of +603 per year, detailed in a Cambridge Econometrics forecast.
15.	Dwelling-led 1,050dpa	Models the population impact of an average annual dwelling growth of +1,050 dwellings per annum (dpa).
16.	Dwelling-led 1,100dpa	Models the population impact of an average annual dwelling growth of +1,100 dpa.
17.	Dwelling-led 1,150dpa	Models the population impact of an average annual dwelling growth of +1,150 dpa.

Scenario Summary

4.9 Population change for the 2020–2040 period ranges from a 1.9% decline under the **Employment-led_OE** scenario to 17.5% growth under the **SNPP-2018 (High)** scenario. This range of population growth equates to an estimated housing requirement of +131 to +885 dpa.

4.10 The **SNPP-2014** is a relatively low growth scenario, with underpinning assumptions based on the period when Telford & Wrekin's net migration balance was outwards. Similarly, the **PG Long Term** and **SNPP-2018-10YR** scenarios return relatively low growth to 2040, with each scenario drawing its migration assumptions from the period that includes substantial net outflows from the borough.

4.11 In contrast, the **SNPP-2018** and **PG Short Term** scenarios estimate higher growth, with 15.0% and 12.9% population growth respectively, associated with annual dwelling growth of +797 and +707 dwellings per annum (dpa). These growth projections are underpinned by assumptions drawn from the high migration effects experienced by Telford and Wrekin since 2014/15. The '**High**' variant of the **SNPP-2018** increases population growth to 17.5%, with dwelling growth of +885 dpa.

4.12 The **PG Zero** scenario indicates the degree to which Telford & Wrekin's population would decline in the absence of annual migration effects, with a decline of -0.3% estimated by 2040 and corresponding average annual dwelling growth of +237 dpa.

4.13 The **Employment-led** scenarios present contrasting growth outcomes. In each scenario, workplace-based employment forecasts have been used to estimate likely population growth, using economic activity rates adjusted for OBR uplifts, a fixed commuting ratio, plus an unemployment rate that varies over the forecast period in line with the employment forecasts.

4.14 The **Employment-led Experian Growth** scenario estimates the highest population growth of all the employment-led scenarios, estimating growth of 13.6% and associated dwelling growth of +665 dpa. The **Employment-led Experian** and **Employment-led Cambridge** scenarios estimate growth of 10.6%, aligned to +560 dpa and +551 dpa respectively. In contrast, the **Employment-led OE** scenario estimates a population decline over the same plan period, a fall of 1.9%, aligned to a dwelling requirement of +131 dpa.

4.15 The **Dwelling-led** scenarios present high growth outcomes, relative to the trend scenarios. In each scenario, annual dwelling growth targets have been used to estimate likely population growth, using 2014-based household representative rates, communal population statistics and a dwelling vacancy rate.

4.16 The **Dwelling-led_1150dpa** scenario estimates the highest population growth, of 26.7%, over the forecast period. The **Dwelling-led_1100dpa** and **Dwelling-led_1050dpa** scenarios estimate population growth of 25.4% and 24.0%, respectively.

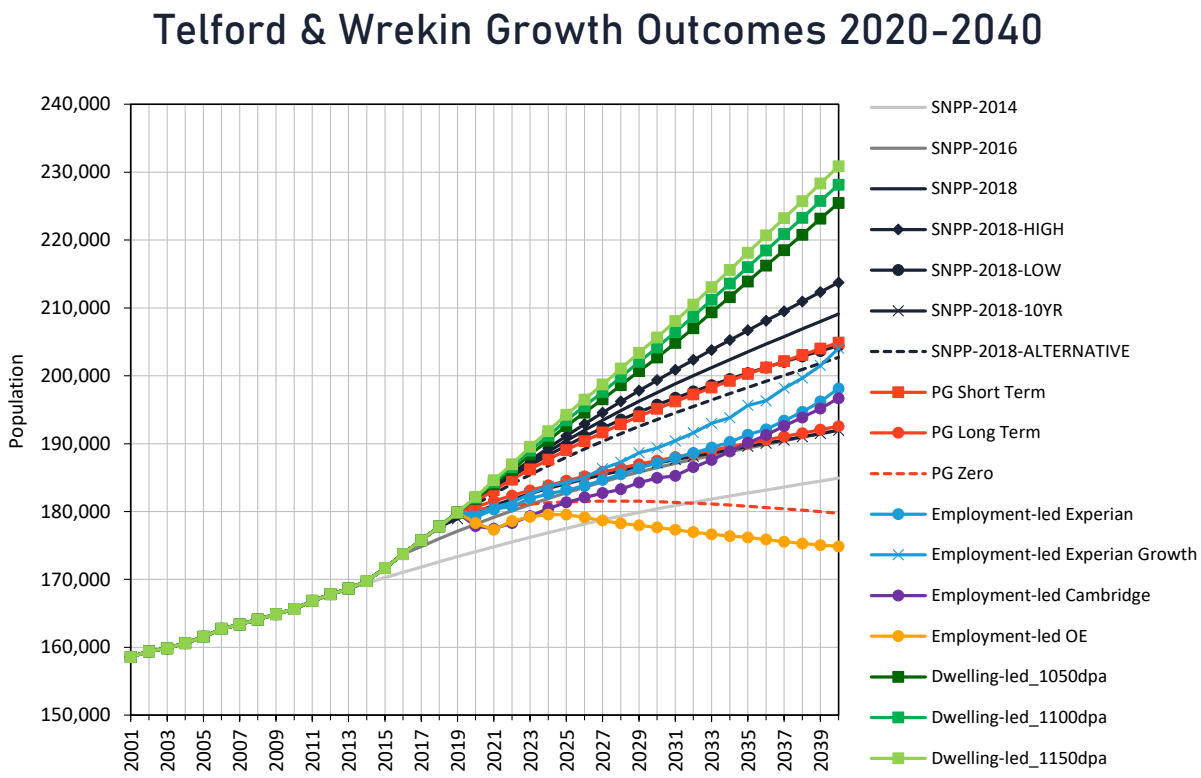


Figure 18: Telford & Wrekin scenario outcomes 2001–2040

Table 3: Population, Household, Migration and Dwelling growth under each scenario 2020–2040

Scenario	Change 2020–2040				Average per year	
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings
Dwelling-led_1150dpa	48,707	26.7%	22,295	29.9%	1,993	1,150
Dwelling-led_1100dpa	46,143	25.4%	21,326	28.6%	1,884	1,100
Dwelling-led_1050dpa	43,581	24.0%	20,356	27.3%	1,774	1,050
SNPP-2018-HIGH	31,905	17.5%	17,155	23.0%	1,367	885
SNPP-2018	27,320	15.0%	15,446	20.7%	1,178	797
Employment-led Experian Growth	24,413	13.6%	12,890	17.5%	975	665
PG Short Term	23,390	12.9%	13,712	18.4%	972	707
SNPP-2018-LOW	22,731	12.5%	13,736	18.4%	988	709
SNPP-2018-ALTERNATIVE	21,609	11.9%	12,925	17.4%	892	667
Employment-led Cambridge	18,848	10.6%	10,680	14.6%	744	551
Employment-led Experian	18,973	10.6%	10,860	14.8%	735	560
SNPP-2016	13,859	7.8%	9,512	13.0%	392	491
SNPP-2018-10YR	12,006	6.7%	9,118	12.3%	478	470
PG Long Term	11,859	6.6%	8,487	11.5%	388	438
SNPP-2014	10,829	6.2%	7,569	10.6%	84	390
PG Zero	-499	-0.3%	4,596	6.2%	0	237
Employment-led OE	-3,438	-1.9%	2,539	3.5%	-262	131

Headship Rate Sensitivity

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

4.18 An alternative set of household representative rates has been generated for Telford & Wrekin, in which the 2014-based rates for the 25–34 age group have been adjusted to 'return' to their 2001 value between 2020–2039, fixed thereafter. This sensitivity analysis estimates how a return to higher household growth rates could manifest itself in higher dwelling growth outcomes for each scenario (Table 4).

4.19 For the **Dwelling-led** scenarios, the application of 2014-based 'return' household representative rates results in lower population growth over the forecast period.

Table 4: Population & dwelling growth under alternative household representative rate assumptions

Scenario	Change 2020–2040		Average Annual Dwelling Growth	
	Population Change	Population Change %	2014-based	2014-based Return
Dwelling-led_1150dpa **(2014-based)**	48,707	26.7%	1,150	
Dwelling-led_1100dpa **(2014-based)**	46,143	25.4%	1,100	
Dwelling-led_1050dpa **(2014-based)**	43,581	24.0%	1,050	
Dwelling-led_1150dpa **(2014-based Return)**	38,221	21.0%		1,150
Dwelling-led_1100dpa **(2014-based Return)**	35,830	19.7%		1,100
Dwelling-led_1050dpa **(2014-based Return)**	33,439	18.4%		1,050
SNPP-2018-HIGH	31,905	17.5%	885	1,058
SNPP-2018	27,320	15.0%	797	964
Employment-led Experian Growth	24,413	13.6%	665	848
PG Short Term	23,390	12.9%	707	876
SNPP-2018-LOW	22,731	12.5%	709	869
SNPP-2018-ALTERNATIVE	21,609	11.9%	667	833
Employment-led Cambridge	18,848	10.6%	551	726
Employment-led Experian	18,973	10.6%	560	735
SNPP-2016	13,859	7.8%	491	649
SNPP-2018-10YR	12,006	6.7%	470	630
PG Long Term	11,859	6.6%	438	603
SNPP-2014	10,829	6.2%	390	541
PG Zero	-499	-0.3%	237	368
Employment-led OE	-3,438	-1.9%	131	274

5 Summary

5.1 Demographic evidence is a critical input to Telford & Wrekin's EHDNA. POPGROUP technology has been used to configure a suite of growth scenarios for Telford and Wrekin. Under each scenario, population, household, migration and dwelling growth is presented over a 2020–2040 plan period.

5.2 Under each scenario, household growth has been estimated using household representative rate assumptions from MHCLG's 2014-based household projection model. Associated dwelling growth has been estimated using a dwelling vacancy rate of 3.1% for the borough. **Employment-led** scenarios have been presented alongside trend scenarios, incorporating key assumptions on economic activity, unemployment and commuting.

5.3 For the **Dwelling-led** scenarios, the population growth associated with each annual dwelling growth has been presented, incorporating key assumptions on household representative rates, communal population statistics and a dwelling vacancy rate.

5.4 A population and dwelling growth summary is presented, including dwelling growth estimated under alternative household representative rate assumptions (Figure 19).

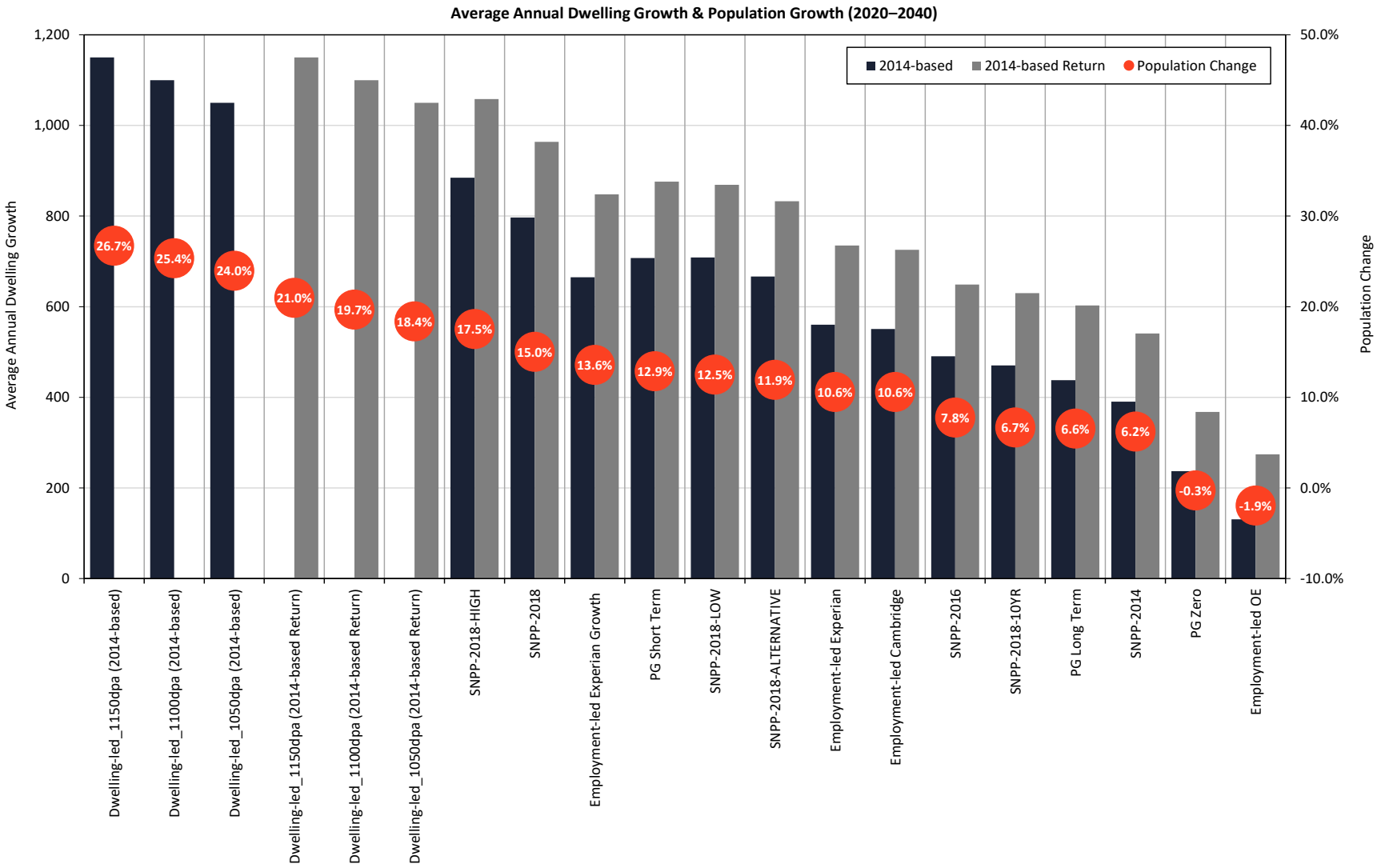


Figure 19: Average annual dwelling growth & population growth under each scenario 2020–2040

Appendix A POPGROUP Methodology

A.1 Demographic forecasts have been developed using the POPGROUP suite of products. POPGROUP is a family of demographic models that enables forecasts to be derived for population, households and the labour force, for areas and social groups. The main POPGROUP model (Figure 20) is a cohort component model, which enables the development of population forecasts based on births, deaths and migration inputs and assumptions.

A.2 The Derived Forecast (DF) model sits alongside the population model (Figure 21) providing a headship rate model for household projections.

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

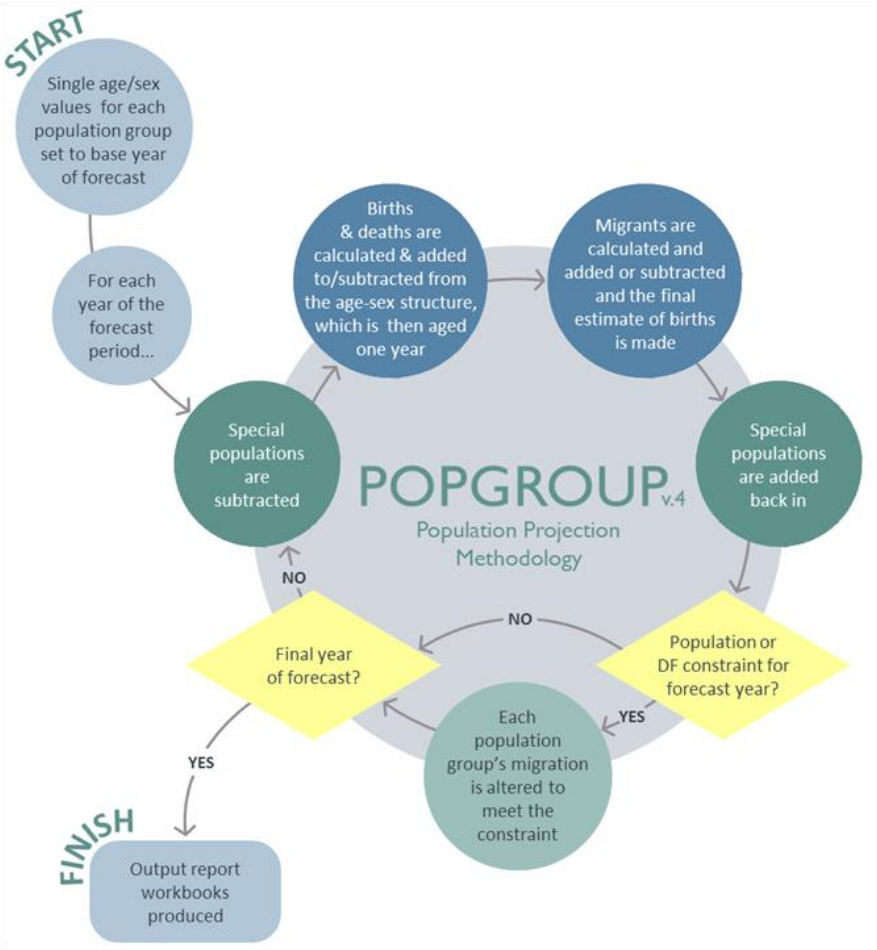
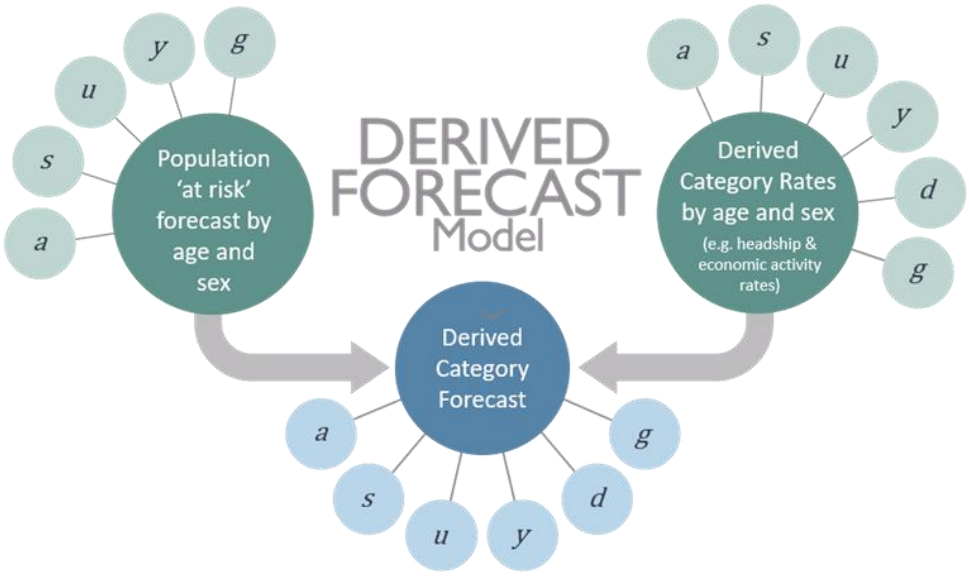


Figure 20: POPGROUP Population Projection Methodology



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

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

Figure 21: Derived Forecast (DF) methodology

Appendix B Data Inputs & Assumptions

Population

B.1 In each scenario, historical population statistics are provided by ONS mid-year population estimates (MYE), with all data disaggregated by single year of age and sex. The **SNPP** scenarios use MYE populations up until their respective 2014, 2016 and 2018 base years. Each of the **PG**, **Employment-led** and **Dwelling-led** scenarios uses an ONS 2019 MYE as its base year.

Births & Fertility

B.2 In each scenario, historical mid-year to mid-year counts of births by sex have been sourced from the ONS MYEs. Under the **SNPP** scenarios, historical births counts have been used until each scenario's base year.

B.3 For the **PG**, **Employment-led** and **Dwelling-led** scenarios, birth counts are used from 2001/02 to 2018/19. From 2019/20, an area-specific and age-specific fertility rate (ASFR) schedule is derived from the 2018-based National Population Projections (NPP). In combination with the 'population-at-risk' (i.e. all women between the ages of 15–49), these ASFR assumptions provide the basis for the calculation of births in each year of the forecast period.

B.4 In each of the **SNPP** scenarios, the future *counts* of births are specified from their base year onwards to ensure consistency with the respective population growth outcomes.

Deaths & Mortality

B.5 In each scenario, historical mid-year to mid-year counts of deaths by sex and 5-year age group have been sourced from the ONS MYEs. Under the **SNPP** scenarios, historical deaths counts have been used until each scenario's base year.

B.6 For the **PG**, **Employment-led** and **Dwelling-led** scenarios, death totals are used from 2001/02 to 2018/19. From 2019/20, an area-specific and age-specific mortality rate (ASMR) schedule is derived from the latest 2018-based NPP.

B.7 In each of the **SNPP** scenarios, the future counts of deaths are specified from their base year onwards to ensure consistency with the respective population growth outcomes.

Internal Migration

B.8 In each scenario, historical mid-year to mid-year estimates of internal in- and out-migration by five year age group and sex have been sourced from the 'components of change' files that underpin the ONS statistics.

B.9 In the **SNPP** scenarios, these historical estimates are used up to each respective base year, with future counts of migrants specified to remain consistent with the corresponding projection.

B.10 Under the **PG Short Term** and **PG Long Term** scenarios, an area and age-specific migration rate (ASMigR) schedule is derived from a 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 six years of historical data (2013/14-2018/19). For the **PG Long Term** scenario, this is derived from the full eighteen years of historical data (2001/02-2018/19).

B.11 For the **PG Zero** scenario, future internal migration is calibrated to ensure a 'zero' annual net internal migration balance.

B.12 Under the **Employment-led** and **Dwelling-led** scenarios, future internal migration assumptions have been derived from the full eighteen-year historical period, with migration altered to meet annual employment and dwelling growth requirements, respectively.

International Migration

B.13 Historical mid-year to mid-year counts of immigration and emigration by five-year age groups and sex have been sourced from the 'components of population change' files that underpin the ONS MYEs.

B.14 In the **SNPP** scenarios, these counts are used up to each scenario's respective base year, with future counts of migrants specified directly from the projection statistics.

B.15 In the **PG Short Term** and **PG Long Term** scenarios, historical counts of immigration are used from 2001/02 to 2018/19. From 2019/20 onwards, an ASMigR schedule of rates is derived from a six-year and eighteen-year migration history respectively and used to distribute future counts by single year of age and sex.

B.16 In the **PG Zero** scenario, future international migration is calibrated to ensure a 'zero' annual net international migration balance.

B.17 For the **Employment-led** and **Dwelling-led** scenarios, future international migration assumptions are derived from the full eighteen-year historical period.

Households & Dwellings

B.18 A household is defined as, "*one person living alone, or a group of people (not necessarily related) living at the same address who share cooking facilities and share a living room or sitting room or dining area*". A dwelling is defined as a unit of accommodation which can either be occupied by one household or vacant.

B.19 The household and dwelling implications of each population growth trajectory have been estimated through the application of household representative rates, communal population statistics and a dwelling vacancy rate. These assumptions have been sourced from the 2011 Census and the MHCLG's 2014-based household projection model.

B.20 A household representative rate is defined as the *"probability of anyone in a particular demographic group being classified as being a household representative"*.

B.21 The household representative rates used in the POPGROUP modelling have been taken from the latest MHCLG 2014-based household projection model, which is underpinned by the ONS 2014-based SNPP. The MHCLG household projections are derived through the application of projected headship rates to a projection of the private household population. The methodology used by MHCLG in its household projection model consists of two distinct stages:

- Stage One produces the national and local authority projections for the total number of households by sex, age-group and relationship-status group.
- Stage Two provides the detailed 'household-type' projection by age-group, controlled to the previous Stage One totals.

B.22 Under each scenario, Stage Two headship rates have been applied by age-group, sex and 'household type' (Table 5).

Table 5: MHCLG 2014-based Stage Two household type specification

MHCLG Category	Description
One person male	One person households: Male
One person female	One person: Female
Couple no child	One family and no others: Couple households: No dependent children
Cple+adlts no child	A couple and one or more other adults: No dependent children
One child	Households with one dependent child
Two children	Households with two dependent children
Three+ children	Households with three or more dependent children
Other households	Other households with two or more adults

B.23 For each scenario, two sets of household representative rates have been applied to the young adult age group (25–34):

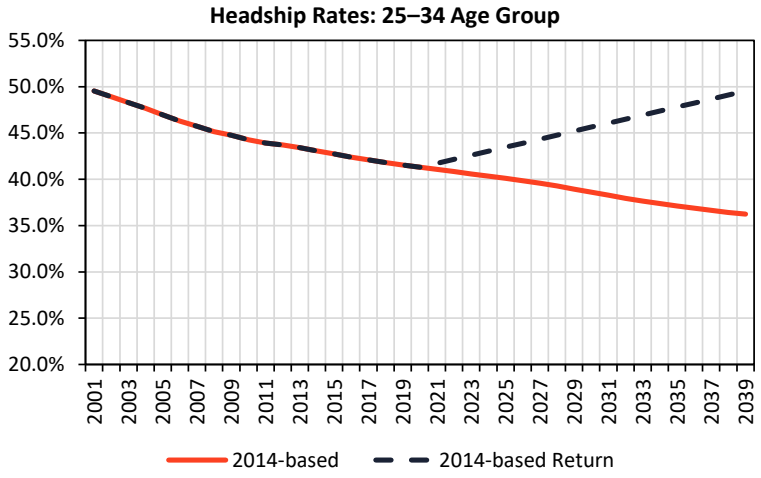


Figure 22: Telford & Wrekin - 2014-based household representative rates for 25–34-year olds

Communal Population Statistics

B.24 Household projections in POPGROUP exclude the population 'not-in-households' (i.e. the communal/institutional population). These data are drawn from the MHCLG 2014-based household projections, which use statistics from the 2011 Census. Examples of communal establishments include prisons, residential care homes, student halls of residence and certain armed forces accommodation.

B.25 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' for ages 75–85+ varies across the forecast period depending on the size of the population.

Vacancy Rate

B.26 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 3.1% has been applied and fixed throughout the forecast period. Using the vacancy rate, the 'dwelling requirement' of each household growth trajectory has been estimated.

Dwellings

5.5 The **Dwelling-led** scenarios model the demographic impact of annual dwelling growth, as follows:

- **Dwelling-led_1150dpa** – an annual dwelling growth of +1,150 is applied.
- **Dwelling-led_1100dpa** – an annual dwelling growth of +1,100 is applied.
- **Dwelling-led_1050dpa** – an annual dwelling growth of +1,050 is applied.

Labour Force & Jobs

B.27 The labour force and jobs implications of each population growth trajectory have been estimated through the application of three key economic assumptions: economic activity rates, commuting ratio and an unemployment rate. The economic activity rates determine the estimated annual change in Telford & Wrekin's resident labour force, whilst the unemployment rate and commuting ratios link the labour force to *workplace -based employment* in Telford & Wrekin.

Economic Activity Rates

B.28 Economic activity rates measure the proportion of the population that are actively involved in the labour force, either employed or unemployed and looking for work.

B.29 Economic activity rates by five-year age group (ages 16–89) and sex have been derived from Census statistics, with adjustments made in line with the Office for Budget Responsibility's (OBR) analysis of

labour market trends in its 2018 Fiscal Sustainability Report[4] (Figure 23). The economic activity rate adjustments have been applied to all scenarios.

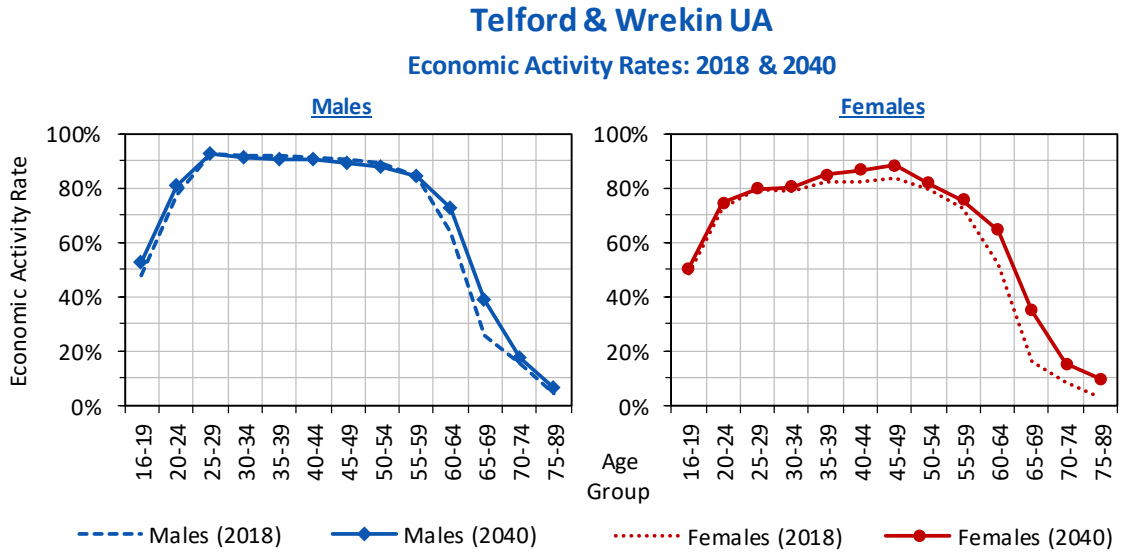


Figure 23: Telford & Wrekin - Economic activity rates (2018-2040)

Commuting Ratio

B.30 The commuting ratio indicates the balance between the level of employment and the number of resident workers. A commuting ratio greater than 1.00 indicates that the size of the resident workforce exceeds the level of employment available in the area, resulting in a net out-commute. A commuting ratio less than 1.00 indicates that employment in the area exceeds the size of the labour force, resulting in a net in-commute.

B.31 In Telford & Wrekin, according to the 2011 Census Travel to Work Survey, the number of resident workers was approximately 78,500, with the number of employed workers at 83,500. This results in a commuting ratio of 0.94, indicating a net in-commute. This is applied in all scenarios and fixed throughout the forecast period.

Unemployment

B.32 The unemployment rate is the proportion of unemployed people within the total economically active population. Historical unemployment rates are sourced from ONS model-based estimates. For Telford & Wrekin, the 2019 unemployment rate of 3.8% has been applied in each of the trend and **Dwelling-led** scenarios and fixed throughout the forecast period.

Employment Forecasts

B.33 The **Employment-led** scenarios model the demographic impact of a projected level of annual employment growth, measured as *workplace-based employment.* Workplace-based employment is a

[4] OBR Fiscal Sustainability Report 2018

'people-based' measure, rather than a jobs-based measure of economic activity. The two measures are directly related, but the jobs-based measure is typically reported in employment forecasts, including both full-time and part-time positions. The workplace-based employment figure measures the number of people employed, linking directly to people-based measures of unemployment, commuting and economic activity.

B.34 The **Employment-led** scenarios (**Employment-led Experian**, **Employment-led OE, Employment-led Cambridge**) model the demographic impact of the annual workplace-based employment growth outlined directly in the Experian, Oxford Economics and Cambridge Econometrics employment forecasts for Telford & Wrekin. The **Employment-led Experian Growth** scenario models the demographic impact of an annual workplace-based employment growth, based on an uplift to the Experian forecast[5]. The annual change in employment applied under the scenarios is illustrated (Figure 24).

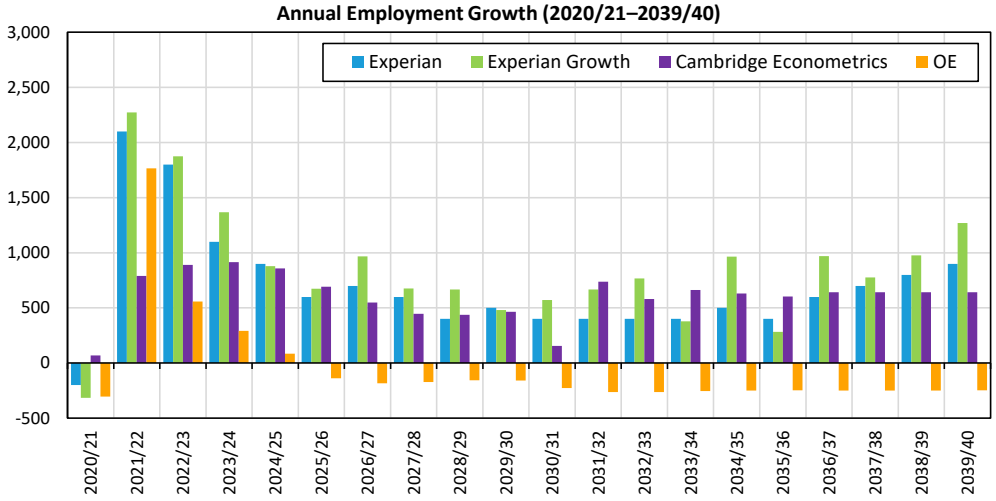


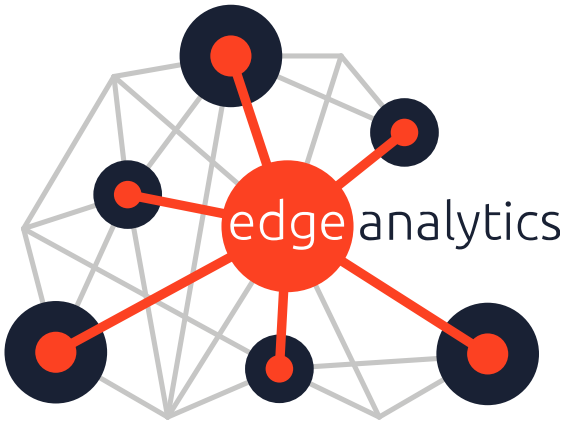
Figure 24: Telford & Wrekin - Experian and OE employment growth forecasts

B.35 The Experian economic forecast projects average annual employment growth of +700 per year over the plan period, with annual employment growth expected in each year from 2021/22. The Experian Growth forecast projects higher average annual employment growth +859 per year, following a similar trend to the core Experian forecast. The Cambridge Econometrics forecast projects average annual employment growth of +603 per year. Conversely, the OE economic forecast estimates average annual employment change of -46, with an annual decline in employment from 2025/26.

B.36 In running the **Employment-led** scenarios, economic activity rates and the commuting ratio are consistent with the trend scenarios, whilst the unemployment rate is consistent with that estimated in the respective employment forecasts[6].

[5] The Experian Growth forecast provides an annual jobs figure for Telford & Wrekin. For use in POPGROUP, annual workplace-based employment has been derived from the annual jobs forecast, based on the core Experian forecast.

[6] In the absence of a defined unemployment rate, the **Employment-led Cambridge** scenario applies the historical unemployment rate up to 2019. From 2020–2021, the unemployment rate follows the trend outlined in the OE forecast, then returning to its 2019 level by 2025. From 2025 onward, the unemployment rate follows the trend detailed in the Experian forecast.



Edge Analytics Ltd
Nexus | Discovery Way | University of Leeds | Leeds | LS2 3AA
www.edgeanalytics.co.uk