

Data Management and Analysis Group

2003 Round Ward Population Projections

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This *DMAG Briefing* describes the recent changes and processes used in the ward projection model in order to produce the 2003 Round of population projections, as well as background on the data sources and examples of both the data used and data produced.

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Changes to the model

The 2003 Round of ward population projections is now complete. Since the publication of the results of the 2002 Round, a number of changes have occurred both with the data used in the model as well as the model itself.

Many of the changes are related to the release of the 2001 Census data. In particular, the new data required a change to the base year of the model, and the new ward boundaries needed to be incorporated. The base year of the model was changed from 1991 to 2001 and extended from 2016 to 2021.

Further detail about the ward model, including the methodology used to combine electorate and dwellings data as a proxy for migration, will be available shortly in a *DMAG Briefing*.

Table 1: Changes to the Ward Model

	2002 Round	2003 Round
Base year	1991	2001
Years where borough estimates exist	1991-2001	2001-02
Projected years	2002-2016	2003-2021
Single years of age	0-85+	0-90+
Wards	1991 boundaries (with changes up to 1996)	2002 boundaries
Borough constraint	2002 Round, Scenario 7.9	2003 Round, Scenario 8.1

Scenario 8.1

The GLA 2003 Round Scenario 8.1 borough population projections were developed from the GLA 2003 Round Central projection. The key inputs to the Central projection were:

- ONS revised 2001 mid-year estimates by age and gender
- 2001-02 change analysis from the ONS mid-year estimates

The borough level migration assumptions for 2002-03 were developed from the annual gross migration flows in the years 1997-98 to 2001-02. The flows were 'smoothed' and the trend from 1998-99 to 2001-02 was extended to 2002-03. After 2003 the gross inflows from outside London were held constant and the model's use of age-specific probabilities of migration flows starting in each borough created the gross outflows. This leads to a population of 8.108 million in Greater London in 2016.

In Scenario 8.1 the growth in population between 2002 and 2016 in the Central projection was apportioned amongst the boroughs in accordance with the growth in homes as described in *London's Housing Capacity* (GLA, 2000). This was done in three periods: 2002-06, 2006-11 and 2011-16. The population capacity of each borough at 2006, 2011 and 2016 was estimated using constant levels of average household size (based upon the 2001 Census adjusted for the additional population as in the revised 2001 estimates) and

a constant proportion of the population resident in communal establishments. The borough populations for intervening years were estimated by interpolation and then all were constrained (by single years of age and gender) to the Central projection for London. In this way some of the boroughs have higher projections in Scenario 8.1 than in the Central projection and vice-versa.

The main impact of the process is a shift away from Central boroughs of 58 thousand persons (by 2016) of which 41 thousand go to the Rest of Inner London. At the borough level Camden, Enfield, Greenwich and Hammersmith & Fulham all 'lose' over 30 thousand persons, while Lambeth, Lewisham and Southwark each 'gain' over 30 thousand. Fifteen boroughs have adjustments of less than 10 thousand persons; eighteen boroughs have adjustments equivalent to less than 5% of their populations.

Key data sources

The majority of data used in the model is produced by Office for National Statistics (ONS), although some data is received from individual boroughs.

Populations

Census day population figures by ward and single year of age were provided by the ONS in Standard Table 1. These were available broken down separately into private household and communal establishment populations. One of the basic assumptions of the model is that communal establishment populations remain unchanged from year to year, and so the Census day data can be used directly in the model. However, this assumption is not made for private households, and therefore the total population. An adjustment, using the borough mid-year estimates as a constraint, is made to convert the ward Census private household populations, and hence the ward total populations, into 'mid-year estimates'. The following detail explains how the ward mid-year estimates are calculated from the Census figures;

If for all wards (w) in borough (B) we have:

$P_h(x,g,w,c)$ = Census (c) household population (P_h) in Ward (w) by age (x), gender (g)

$P_c(x,g,w,c)$ = Census (c) communal population (P_c) in Ward (w) by age (x), gender (g)
 = $P_c(x,g,w,m)$ – by assumption same as MYE communal population

$P_h(x,g,B,c)$ = Census (c) household population (P_h) in Borough (B) by age (x), gender (g)

$P_c(x,g,B,c)$ = Census (c) communal population (P_c) in Borough (B) by age (x), gender (g)
 = $P_c(x,g,B,m)$ – by assumption same as MYE communal population

$P(x,g,B,m) = P_h(x,g,B,m) + P_c(x,g,B,c) =$ Borough mid-year population

We need to calculate:

$P_h(x,g,w,m) =$ MYE (m) household population (P_h) in Ward (w) by age (x), gender (g)

$P_h(x,g,w,m) = P_h(x,g,w,c) * [P(x,g,B,m) - P_c(x,g,B,c)] / [\sum_w \{P_h(x,g,w,c)\}]$

= Ward census household population raised in ratio of the borough MYE household population (estimate) to the sum of the ward census household populations.

Source: ONS 2001 Census and mid-2001 population estimates.

Vital Statistics for mid-2001 to mid-2002

The changes to the ward boundaries has meant that much ward data are not available on the present geographies prior to 2002. In particular, this affected the vital statistics (births and deaths by gender) tables received from ONS. Data for mid-2001 to mid-2002 were also needed by ONS. Special analyses were prepared and supplied to the GLA. Once received, these figures were fed into the model in order to 'age on' and 'survive' the population.

*Source: ONS, Health and Care Unit
GLA calculations – fertility and mortality adjustments*

Migration

Ward migration data are not available, therefore electorate and dwelling data are combined and used as a proxy. While the population data from the Census is just for the one year, the electorate data provides annual, and therefore up-to-date, ward electorate changes for people aged 17 and over. However, not all residents, even those so qualified, are on the electoral register. The dwelling stock data gives an indication of the changing availability of housing for local residents and gives some indication of the potential for people to move into particular localities, ie increased housing can act as a magnet for people, while a decrease can have the opposite effect. When taken together, electorate and dwelling data give a good prediction of local migration patterns in estimate years (ie 2002). Dwelling data, though, is the sole indicator for projection years.

Electorates

Electorate data is usually compiled from RPF29 forms, sent to the GLA via the ONS by each individual borough. Some boroughs were not able to provide ONS with electorate figures based on the new ward geographies, only on the old ward basis. ONS therefore carried out a matching exercise to create a series of data over a four year period (October 1999 – October 2002) of Parliamentary electorate figures for new wards. GLA used these to estimate the electorates at mid-2001 and mid-2002 and these figures were then used in the model. Table 2 shows the GLA estimates of the electorates for each borough, except the City of London, for mid-2001 and mid-2002.

Source: ONS, RPF29 Summary of Register of Electors

Table 2: GLA Estimates of Electorates

	Mid-2001	Mid-2002		Mid-2001	Mid-2002
London (excluding City)	5,167,224	5,183,487			
Barking and Dagenham	116,068	117,175	Hounslow	156,526	157,178
Barnet	231,870	234,124	Islington	128,634	127,647
Bexley	168,438	169,134	Kensington and Chelsea	99,262	98,437
Brent	174,852	171,694	Kingston upon Thames	100,830	101,834
Bromley	225,135	225,521	Lambeth	193,739	196,559
Camden	137,603	139,896	Lewisham	180,019	181,023
Croydon	239,534	238,669	Merton	134,054	133,204
Ealing	214,148	215,935	Newham	156,718	163,753
Enfield	200,820	197,050	Redbridge	178,277	180,435
Greenwich	155,883	157,081	Richmond upon Thames	128,892	123,136
Hackney	131,709	136,090	Southwark	169,705	171,042
Hammersmith and Fulham	114,770	113,424	Sutton	131,362	129,884
Haringey	149,337	150,823	Tower Hamlets	137,867	140,765
Harrow	158,961	159,635	Waltham Forest	161,318	159,930
Havering	177,480	177,564	Wandsworth	202,052	202,952
Hillingdon	181,262	181,567	Westminster	130,101	130,328

Dwelling stock

The 2001 Census provides an estimate of the household spaces in each ward. This is used as the base at mid-2001. The basis of the additional dwelling stock data is the London Housing Capacity Study (LHCS). It combines identified and unidentified sites as well as an estimate of reductions in vacancy to arrive at the total number of additional homes in each borough in each five-year period. Identified sites are assigned to the relevant ward, but the data relating to unidentified sites has to be spread amongst the wards in proportion to existing household spaces, reductions in vacancies are spread amongst the wards in proportion to the number of vacant household spaces at the time of the 2001 Census. Once the data has been assigned to the wards for the 5-year period, the figures are evenly spread across each of the 5 years to give annual data. As well as this, if available, the individual boroughs have provided the GLA with their own more recent borough development data, which provides a useful addition to the LHCS, bringing the figures more up-to-date and enabling better annual distributions of change in five-year periods. Data from the LHCS only goes as far as 2016. It has been assumed that changes in 2011-16 are repeated in 2016-21.

*Source: London Housing Capacity Study (GLA, 2000)
Individual Borough development data
2001 Census Key Statistics Table 16*

Availability of data

As with most other DMAG products and Briefings, the ward and borough projection data will be available, in part, via the Demography Extranet. This will be a summary of data by five year age bands for every fifth projection year. There will also be a full set of data for each borough and ward, by single years of age for every projection year. These will be available on a CD on request from Georgia Hay (georgia.hay@london.gov.uk, 020 7983 4347).

Tables and Maps

On this and the following pages, a number of tables and a map have been used to present information about the data used in the model and produced by the model, as well as an indication of the boroughs who have provided the GLA with housing development data.

Table 3 indicates which boroughs have provided the GLA with development data to be used in combination with the London Housing Capacity Study.

Table 4 is an example of development data provided – Enfield.

Table 5 shows an example of data used in the model, as well as the 2006 projected population – Ealing.

Map 1 presents the projected population change over the period 2001 to 2006 by ward.

Table 3: London Borough Development Data

	2001 -2	2002 -3	2003 -4	2004 -5	2005 -6	2006 -7	2007 -8	2008 -9	2009 -10	2010 -11	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16
Barking and Dagenham			X	X	X	X	X	X	X	X	X	X	X	X	X
Barnet				X	X		X						X		
Bexley	X	X	X	X	X										
Brent															
Bromley															
Camden															
Croydon															
Ealing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Enfield	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Greenwich	X	X	X	X	X		X						X		
Hackney															
Hammersmith and Fulham	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Haringey															
Harrow	X	X	X	X	X		X						X		
Havering			X				X						X		
Hillingdon															
Hounslow															
Islington															
Kensington and Chelsea															
Kingston upon Thames															
Lambeth															
Lewisham															
Merton															
Newham	X	X	X	X	X		X						X		
Redbridge															
Richmond upon Thames															
Southwark			X							X					
Sutton			N	I	L		R	E	T	U	R	N			
Tower Hamlets															
Waltham Forest	X	X													
Wandsworth															
Westminster	X	X		X											

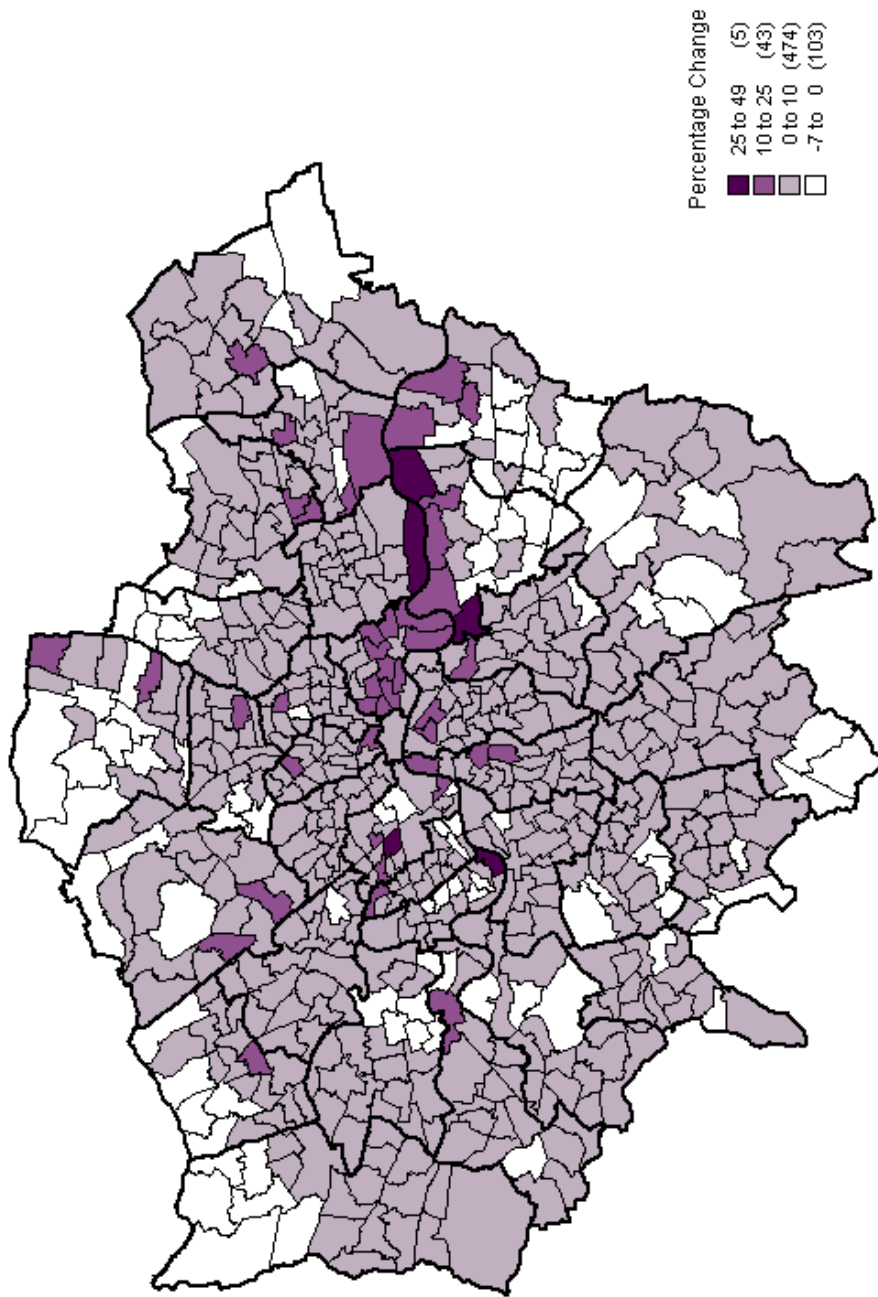
Table 4: 2001 Census Household Spaces and Additional Homes for LB Enfield

	2001 Census	Additional homes														
	Household Spaces	2001-2	2002-3	2003-4	2004-5	2005-6	2006-7	2007-8	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Enfield	113,229	1,367	-86	516	1,183	1,200	521	521	505	429	429	495	495	495	495	495
Bowes	5,044	10	1	5	42	42	55	55	55	55	55	80	80	80	80	80
Bush Hill Park	5,339	3	16	41	64	29	25	25	20	20	20	20	20	20	20	20
Chase	5,474	14	6	5	22	22	25	25	22	22	22	42	42	42	42	42
Cockfosters	5,188	56	32	37	54	27	30	30	20	20	20	20	20	20	20	20
Edmonton Green	6,448	75	-427	-1	143	115	21	21	20	20	20	30	30	30	30	30
Enfield Highway	5,521	26	1	26	40	21	24	24	17	17	17	17	17	17	17	17
Enfield Lock	5,319	359	94	118	139	94	28	28	20	20	20	20	20	20	20	20
Grange	5,087	43	13	53	71	25	28	28	35	21	21	21	21	21	21	21
Haselbury	5,664	-1	1	1	12	12	15	15	14	14	14	14	14	14	14	14
Highlands	5,370	2	0	30	52	57	19	19	13	13	13	18	18	18	18	18
Jubilee	5,209	3	7	2	13	13	15	15	13	13	13	13	13	13	13	13
Lower Edmonton	5,133	426	82	52	59	14	15	15	8	8	8	8	8	8	8	8
Palmers Green	5,471	20	0	8	60	60	35	35	30	30	30	57	57	57	57	57
Ponders End	5,236	11	2	6	41	41	20	20	76	14	14	14	14	14	14	14
Southbury	5,250	100	0	12	27	80	24	24	18	18	18	18	18	18	18	18
Southgate	5,490	30	17	55	88	171	23	23	21	21	21	15	15	15	15	15
Southgate Green	5,122	28	27	4	33	44	26	26	22	22	22	22	22	22	22	22
Town	5,884	136	41	11	29	35	20	20	14	14	14	14	14	14	14	14
Turkey Street	5,118	2	0	31	62	97	14	14	12	12	12	8	8	8	8	8
Upper Edmonton	5,783	4	0	11	99	120	26	26	26	26	26	15	15	15	15	15
Winchmore Hill	5,079	20	1	9	33	81	33	33	29	29	29	29	29	29	29	29

Table 5: Ward and Borough Level Estimates used in the Ward Projection Model for LB Ealing

	2001 mid-year estimate	2001 Census household spaces	2001-2 Births	2001-2 Deaths	mid-2001 electorate	mid-2002 electorate	2001-6 stock change	2001-6 stock change (%)	2006 projected population
EALING	308,072	120,887	4,316	2,218	214,148	215,935	3,005	2.5	315,077
Acton Central	13,795	5,733	191	91	9,237	9,250	206	3.6	14,128
Cleveland	14,458	5,885	181	105	9,618	9,684	123	2.1	14,517
Dormers Wells	13,345	4,318	209	107	8,919	8,906	19	0.4	13,835
Ealing Broadway	13,042	5,879	140	102	9,262	9,296	169	2.9	12,842
Ealing Common	13,179	5,801	126	127	9,590	9,584	128	2.2	12,756
East Acton	14,791	5,877	177	87	9,439	9,578	473	8.0	16,149
Elthorne	12,671	5,690	193	88	9,330	9,326	216	3.8	13,006
Greenford Broadway	13,555	5,481	196	111	9,772	9,709	299	5.5	14,199
Greenford Green	12,717	4,962	175	101	9,402	9,337	93	1.9	12,733
Hanger Hill	14,381	6,253	157	96	9,602	9,704	165	2.6	14,271
Hobbayne	13,343	5,436	173	110	9,257	9,312	105	1.9	13,447
Lady Margaret	13,036	3,971	189	98	9,347	9,586	47	1.2	13,686
Northfield	12,839	5,465	159	101	9,573	9,682	96	1.8	12,588
North Greenford	13,352	4,823	169	74	9,276	9,536	36	0.7	13,622
Northolt Mandeville	13,123	5,360	205	94	9,306	9,411	196	3.7	13,668
Northolt West End	13,683	5,616	233	97	9,392	9,555	92	1.6	14,185
Norwood Green	12,892	4,149	213	105	8,439	8,566	87	2.1	13,518
Perivale	13,713	5,082	186	85	9,582	9,634	106	2.1	14,093
South Acton	13,675	5,996	188	104	8,990	8,994	106	1.8	13,681
Southall Broadway	13,389	3,691	265	85	9,161	9,252	46	1.3	14,321
Southall Green	13,177	3,875	235	85	9,043	9,315	70	1.8	14,252
Southfield	12,856	6,023	172	65	9,356	9,432	56	0.9	12,675
Walpole	13,061	5,521	184	100	9,259	9,289	69	1.3	12,904

Map 1: GLA 2003 Round - Scenario 8.1 - Projected Ward Population Change - 2001 to 2006



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