

Flexible Area Model Development

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GLA Demography produces a range of population projections which are used to help inform planning and policy work within the GLA and across London. Most of the projections are updated annually, incorporating the latest data as it becomes available.

The GLA works to ensure that its population projections models make use of the most up-to-date methods and as such the models are continually evaluated and redeveloped from year to year.

This document briefly outlines the development of a new approach to small area modelling using a process to estimate past small area gross migration flows and a projection model which makes use of those flows (flexible area model).

Small Area Model

Small area (geographic units below local authority) projection is challenging primarily because of a lack of timely and robust data on the components of population change. Specifically, migration data for areas below local authority has historically only been available from the UK census either directly (for in migration) or derived and modelled (for out migration). This means that the methods developed for local authority projections are not available at small area.

Previous iterations of the GLA Small Area Model have used rates, flows and age structures derived from commissioned census outputs to model migration for small area¹. This approach has two main drawbacks. Firstly, it does not account for changes in migration patterns and behaviours since the census – it is rooted in 2011 patterns. Secondly, migration outputs from the 2021 census are expected to be heavily pandemic affected making them unusable for the purposes of modelling. Continuing an approach which relies on census data is therefore not feasible.

Development of a new method

For the 2021-based² projections the GLA is preparing a new approach to modelling small area populations. This approach rests on the development of a backseries of annual gross migration flows in to and out of each area. Access to a time series of past gross flows enables use of a methodology similar to that employed in the local authority level projections.

¹ Full details can be found in the housing-led and small area model documentation.

² And the 2020-based Borough Preferred Options

Gross migration flows backseries

The GLA has developed a process to create a backseries of modelled annual gross migration flows for small areas, which is then used as an input to the projection model.

The first stage of this process is to derive MSOA-level estimates of annual net migration by age and sex from published estimates of population, births, and deaths.

These net migration estimates are then split into constituent in and out gross flows using a model that aims to identify the most probable combination of in and out flows for a given net figure, and which uses origin-destination data from the 2011 Census as a baseline.

Flexible Area Model

This approach has been extended to allow modelled gross flows to be flexibly created for other geographies.

The approach is similar to that used for creating the outputs by MSOA, but published OA and LSOA data is best fit to the geography of choice to create a backseries of population, births and deaths, that in turn is used to estimate annual net migration. These net migration estimates are then split into gross flows as before, but using baseline flows best-fit from the Census MSOA data.

The model that has been developed allows projections to be produced on a wide range of alternative geographies, including recent electoral wards and TfL model zones, and is accordingly referred to internally as the *Flexible Area Model*.

This model uses an approach already used by the GLA at local authority level to project at small area taking advantage of the available and modelled components of change. This is a two-stage projection:

- Stage 1: A trend projection is run which incorporates past data on population change;
- Stage 2: A housing-led projection is run which incorporates a housing development trajectory and data on past occupancy to estimate housing capacity and household population.

These two populations are reconciled to produce a population consistent with past trends and available housing. Detailed components of change including gross in and out migration flows are available as outputs of this model.

Use of the model

The GLA intends to use the Flexible Area Model in the production of the 2020-based Borough Preferred Option (BPO) projections. These projections are provided directly to boroughs and are not published by the GLA.

The first publicly available outputs from the model will be the 2021-based projection currently scheduled for release in December 2022.

Full documentation on the Flexible Area Model will be available in due course.