# Population Weighted Centroids Guidance for Workplace Zones

## INTRODUCTION

Population weighted centroids have been created for the 2011 workplace zone (WZ) geography. These centroids represent the spatial distribution of the workforce in each of the WZ, as recorded in the 2011 Census, represented by a single summary reference point on the ground.

## METHODOLOGY

Each population weighted centroid was calculated using a median centroid algorithm, the result of which is less influenced by outliers than the result of an algorithm to calculate the mean centroid.

The median algorithm used was the Median Center *(sic)* function in ArcGIS 10.0, run against the coordinates and the number of workers in each WZ. Where the calculated centroid fell outside the boundary of the WZ being calculated, or within two metres of the WZ boundary, it was moved to the nearest location at least two metres inside the WZ boundary.

The population weighted centroids were created using the Full Resolution Extent of the Realm boundaries, for the WZ.

More information about how the Median Center algorithm works is **here**.

## PURPOSE

The population weighted centroid is a summary reference point representing the centre of the workforce in a WZ.  These centroids can be used in GIS software to support a variety of analyses.

National statistics, including all census estimates, for all levels of geography, are best-fitted from output area.

Output areas are the lowest level of geography for which Census estimates are published.  They are used as building bricks of population, based on where one population lives.

This means that estimates for all geographies produced as a national statistic are aggregations of whole output areas, in line with the **Geography Policy for National Statistics**.  The best-fitting of OA to any geography is determined by plotting the population weighted centroids into the boundaries of the output geography. Where an OA's centroid falls within an area's boundary, the OA is assigned to that area.

Workplace zones are the lowest level of geography for which Census workplace estimates are published.

Workplace zones could be used as a building block for building workplace based statistics for any geography, in the same way as output areas are used to build population statistics based on where people live.  However, this use of WZ as a building block for workplace statistics has not been officially adopted into the policy.

## CURRENCY

Population weighted centroids were produced using the 2011 Census population database and the 2011 WZ digital boundaries.  The population weighted centroids are referred to as 'workplace population weighted centroids for the 2011 WZ'.

## GEOGRAPHIC EXTENT

Population weighted centroids have been calculated for every 2011 WZ in England and Wales.

## FORMAT

The population weighted centroids are available in ESRI Shapefile and MapInfo Mid/Mif format.