Note on Employment Land Needs for Greater Manchester

February 2020

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This paper has been prepared by Nicol Economics for the GMCA to provide :

1) A refresh of the different methods and summary of the key data that could be used to assess future demand for employment land

2) A review of the range employment land requirements using latest available data including updated economic forecasts.

3) Implications of the analysis.

Postscript Note: this analysis in this paper was produced before the **Covid-19 pandemic** started to impact on the UK economy. Covid-19's impact on the world economy and the UK Government's policy response will clearly impact on the performance of the GM economy. This will affect the demand for floorspace in the short term (next 1-2 years) and also may have impacts in the medium term (3 to 5 years). We consider, however, that it is relatively unlikely to substantially impact on the 15 year forecasts and assessment for the Greater Manchester economy, although there are many uncertainties about the length and nature of the eventual economic recovery from Covid-19 globally, in the UK and so in Greater Manchester.

1. Introduction

1.1 This note sets out the independent advice of Nicol Economics on the future scale of employment land needs in Greater Manchester (GM) for the Greater Manchester Spatial Strategy (GMSF).

Positioning this note and caveats

1.2 The analysis has been produced to inform the GMSF assessment of **overall economic needs** for employment land; therefore it is important to note:

- The analysis is of the future requirements for employment **floorspace.** This needs to be converted into the land requirements by the GMCA based on appropriate densities for different uses.
- The analysis covers **GM as a whole** and does not break down the assessment of need by district, although some but not all of the data used and analysed is available at a district level. The choice of the locations for provision of employment land allocations in the future is not therefore covered by this paper.
- The analysis considers only requirements for employment land in **B Use Classes**. The analysis considers needs in quantitative terms for **office** uses in total (B1a and B1b) and **industrial and warehousing** uses (I&W) in total (B1c, B2 and B8). It does not consider demand separately for B1b (R&D) space nor does it consider employment land and property needs for other use classes. It does not consider the quality of employment land and floorspace nor the precise location of need.
- The analysis considers only the demand/need in the future for employment floorspace, it does not consider the **supply position**, which is addressed elsewhere.
- The analysis covers the total assessed need for the current proposed GMSF plan period **from 2020 to 2037**.

1.3 The paper makes best possible use of available data. However, there is always inherent uncertainty in looking forward for an economy as large and complex as GM's.

Approach to assessing employment land needs

National guidance

1.4 There is limited guidance on exactly how to assess employment land needs. The updated National Planning Policy Framework (NPPF) says nothing new of significance in relation to economic needs assessment (see para 80 to 84). The relevant guidance is set out in Planning Policy Guidance (PPG) paras 25 to 30 in the section on "*Housing and economic needs assessment".* PPG states that strategic policy-making authorities need to prepare a **robust evidence base** to understand existing business needs, which will need to be kept under review to reflect local circumstances and market conditions

1.5 In terms of what PPG calls "market signals" (or what we might call forecasts of needs) it states that plan makers will :"*need to develop an idea of future needs based on a **range of data** which is **current and robust, such as***":

1) **sectoral and employment** forecasts and projections (labour demand)

2) **demographically derived assessments** of future employment needs (labour supply techniques)

3) analysis based on the **past take-up of employment land and property** and/or future property market requirements

4) **consultation** with relevant organisations, studies of business trends, and monitoring of business, economic and employment statistics.

1.6 It is clear than no one single method is preferred or required by PPG. However, the guidance appears to encourage the use of as wide a range of data as possible. Most employment land studies and assessment also include some form of "buffer" or "margin" to reflect a number of factors. It is important to note that there is no guidance on these factors nor the size of any margin in PPG.

Consideration of different approaches in this paper

1.7 As noted, there is no one "right" or standard method to assess employment land need (unlike for housing need) and the method or methods used can and do vary depending on the area, the data available etc. In assessing future needs there are two key concepts:

- First, **net new demand** for the stock of employment floorspace which is the global GM-wide demand that will occur as a result of overall economic change ("net demand")
- Second, the demand which result essentially from the same business activity relocating within GM to better or more suitable premises ("**replacement demand**"). This generates overall positive demand only where the space they vacate cannot be re-used or can only be partly re-used for employment uses (ie it is left semi or fully derelict/vacant or is re-used for other uses (non B Use class)). This issue tends to be far more significant for industrial and warehousing uses where the age and appropriateness of the stock is more problematic than say for offices.

1.8 The combination of the two form the overall demand for new employment floorspace/land needs ("gross demand").

Gross Demand or the overall need for employment land/space = Net demand driven by overall economic change + demand as a result of businesses replacing old with new employment space

1.9 The approach in this paper is to consider all sources of information and attempt to triangulate across the methods and produce a reasonable range from which an average from different methods is used. Essentially, as noted above, there are three broad methods (with some variants) that can be used and often a "blended" approach is used that combines or triangulates between methods. The methods are:

1) Use of **past employment land take-up** or **completions** by Use Class as the basis for forecasting future need. This has been the primary method used for the GMSF to date (eg as set out in the January 2019 Employment Topic Paper). This method essentially assumes that given that the GM economy has, on average, needed a certain level of new employment land/floorspace in the past that this need is likely to continue into the future.

   - The main advantages of this method is that it based on real and measurable evidence of actual take of employment land and that, crucially, it takes account of all types of factors that drive the need for employment land (new demand and demand that is replacement demand for space which is too old etc).

- The main disadvantage is that it assumes the past (for whatever period used) is good guide to the future. It cannot take into account the aspirations for growth and development of the GM economy if this is not reflected in past performance.

2) Use of **forecasts of economic drivers** that lead to demand for employment floorspace. The normal proxy that is used is employment. In doing so, it is assumed that the past and current relationship between jobs and the demand for employment floorspace will continue broadly unchanged into the future. There have also been instances of the use of GVA change instead as a proxy for demand (in the case of the manufacturing sector[1]).

- The main advantage of these methods is that they take into account the best estimates of the likely (or hoped for) direction of the economy - which may be quite different than that which has occurred historically. It is also possible to model a range of growth scenarios to see the implications for demand for employment floorspace.
- The two main disadvantages of this method are: (1) there is inevitably a degree of uncertainty about any forecast 10 to 20 years in the future which is compounded by the sensitivity of this method to which sectors employment change is expected to occur; and (2) this method only forecasts net need for employment space and cannot forecast any replacement demand so a separate assessment of future replacement demand is needed. This method also relies on the assumptions that the current and historic relationship between employment (or GVA) and floorspace for a sector will continue into the future.

3) Use of forecasts of **labour supply**. This method works back from an assumed level of growth in an area's workforce to assess what additional employment land would be needed to meet this growth. It is conceptually different from the use of employment change forecasts only where there are significant differences between the resident labour force and jobs in an area (due to commuting patterns).

- The main potential advantage of this method is that it should ensure consistency between planning for housing and labour force and planning for employment land/floorspace.
- The main disadvantage is that there are many steps working back from any change in the labour force to employment land needs (assumptions about the sectors that people will be employed it etc).

1.10 We have used or at least considered all of these methods. There is not a robust enough dataset to be able to model the relationship between GVA and employment floorspace needs for GM, therefore we have not used a GVA forecasting method. However, we have used GVA forecasts and past changes to help inform our assessment. Given that, under the forecasts used in the assessment, employment and the labour force move in very similar way we have not looked at the labour supply method separately. The two methods used in this paper are therefore: (1) past completions; and (2) economic forecasting based on employment (and taking account of replacement demand)

[1] This was one factor used in the evidence base for the now adopted Birmingham Development Plan. See "Employment Land Study for the Economic Zones and Key Sectors in Birmingham", 2012 and "Employment Land and Office Targets Study", 2013 both by Warwick Economics and Development. However, it is not common to use forecasts of GVA to derive forecasts of the need for employment space

Data sources uses

1.11 The research and analysis is based on the following data sources:

1) Past **completions data** provided by each of the 10 GM districts to the GMCA. This data measures the gross take up/completions of new floorspace as recorded by the planning system. The information is aggregated for all I&W and is not separated out for B2, B8 or B1c Use Classes. There is now a run of 15 years' worth of consistent data from 2004/5 through to 2018/19 available across GM. We set out how this data has been analysed and used in Section 3.

2) Past data on **GVA and employment** overall and by sector from the Greater Manchester Forecasting Model (GMFM) which covers actual data up to 2018 analysed by Oxford Economics for the GM area (the GVA data is in 2016 prices).

3) Past data on changes in the **recorded stock** of office and "industrial" floorspace from the Valuation Office Agency (VOA) which covers the period 2000/01 through to 2015/16 but not more recently.

4) Employment and GVA **forecasts** based on the updated **Accelerated Growth Scenario** (AGS 2019). AGS 2019 aligns with the growth ambitions for the North articulated in the NPIER refresh 2019[2] and the strength of the AGS growth reflects GM's strong contribution to this overall Northern Powerhouse growth. We set out how this data has been analysed and used in Section 4

5) Data from <u>some</u> GM districts on past **losses of employment land and floorspace**, which covers a variety of time periods**.** We set out how this data has been analysed and used in Section 4.

2. Overview of the assessment

2.1 Our summary assessment is set out in Table 2.1. This assessment is based on two methods: (1) using past completions and extrapolating these forward; and (2) using the latest forecasts of employment change under the AGS 2019 scenario, plus our best estimates of likely future replacement demand. These figures represent a reasonable range for the likely future needs for GM. The figures based on the employment change forecasting method are slightly higher for both offices (14% for rounded figures) and I&W (5% for rounded figures). We recommend the use of the rounded figures to avoid spurious accuracy.

2.2 To these we have added a margin of annual need/supply (4 or 5 years for the 17 year period); these equate to respectively 24% to 29% uplifts and would represent the upper end of margins that cover rigidities in supply, flexibility for choice and the inherent uncertainties in forecasting future needs. It would be inappropriate to add a further margin to the supply figure (so long as the assessed supply is all regarded as being deliverable and fit for purpose).

2.3 These estimates necessarily have a margin of error around them. The assessment of future levels of replacement demand is particularly challenging for the I&W sector.

2.4 An important question for the GMCA is which approach to use for the purposes of the GMSF. All approaches have their merits and an average of the two approaches could be used. Arguably the use of employment forecasts approach is more consistent with the future-facing approach of the

[2] The 2019 Northern Powerhouse Independent Economic Review transformational growth scenario (NPIER 2019)

GMSF which is seeking to deliver stronger (and more inclusive) growth in GM. However, it is important to note that this approach requires more assumptions and calculations and so is subject to greater uncertainty (around translating jobs to floorspace needs and estimating replacement demand).

Table 2.1: Greater Manchester, estimates of future floorspace needs 2020-37, 000s sqms

FUTURE OFFICE NEED		
	Past completions based	Forecasts based
Net need		1,289
Replacement need		605
Total gross need	**1,687**	**1,970**
Total annual average	99	116
Total overall including 4 year margin	2,083	2,433
Total overall including 5 year margin	2,183	2,549
Total rounded - 4 year margin	**2,100**	**2,400**
Total rounded - 5 year margin	**2,200**	**2,500**
FUTURE I&W NEED		
	Past completions based	Forecasts based
Net need		1,267
Replacement need		1,784
Total gross need	**3,030**	**3,149**
Total annual average	178	185
Total overall including 4 year margin	3,743	3,890
Total overall including 5 year margin	3,921	4,075
Total rounded - 4 year margin	**3,700**	**3,900**
Total rounded - 5 year margin	**3,900**	**4,100**

Source: Nicol Economics calculations. Note: the 2019 Topic paper figures of assessed need were 2.46 million sqm for offices and 4.22 million sqm for I&W for the then 19 year Plan period

3. Method 1: Analysis of past completions data

Summary of key points on past completions

- There is a run of consistent data for the last 15 years used in the analysis, this covers a period of strong economic growth and property expansion up to 2008, a very sharp and deep recession from 2008 to around 2012 and a period of recovery subsequently. This is a reasonable basis as a period on which to base any extrapolation of the past.
- The average (unweighted) annual rate of completions is 98,000 sqm for offices and 169,000 sqm for all I&W. However, the annual figures fluctuate around this average
- We have considered whether there should be some reweighting to take account of the extent to which this period is in any sense "atypical". A review of weighting factors suggests a modest increase to 99,200 sqm per annum for offices and 178,000 sqm per annum for I&W space.
- These figures are based on past gross completions which represents a combination of **new** space required for economic expansion in the sectors as well as some

replacement demand (as businesses move out of stock that is no longer used for employment purposes and has become redundant or is not suitable any longer).

- These figures represent a starting point for considering future needs. However, they may not fully reflect future needs as a result of changes in the growth rate of sectors, changes in the space requirements of businesses and/or changes in the rate of replacement demand needed.
- Given these uncertainties it is important to consider adding some form of "margin" to reflect this uncertainty.

Past completions data

3.1 The completions data for the period 2004/5 to 2018/19 has been provided by GM districts which is used in the modelling of demand. The 15 year run of data used shown below in Figure 3.1. The figures clearly show the volatility of the completions data, but that broadly they respond to economic cycles. The most recent data as reported are:

- I&W: in 2018/19 gross completions were 126,200 sqm which is **75% of the 15 year average** and so slightly reduces the average from 172,000 for the previous 14 years to 169,000 sqm (by 2%). The completions figure for 2018/19 suggests the figure for 2016/17 look like more of a one-off.
- Office: in 2018/19 gross completions were 42,800 sqm which is just **44% of the 15 year average** and so slightly reduces the average from 102,000 for the previous 14 years to 98,000 sqm (by 4%).

Figure 3.1: GM completions data trends, 2004/5 to 2018/19

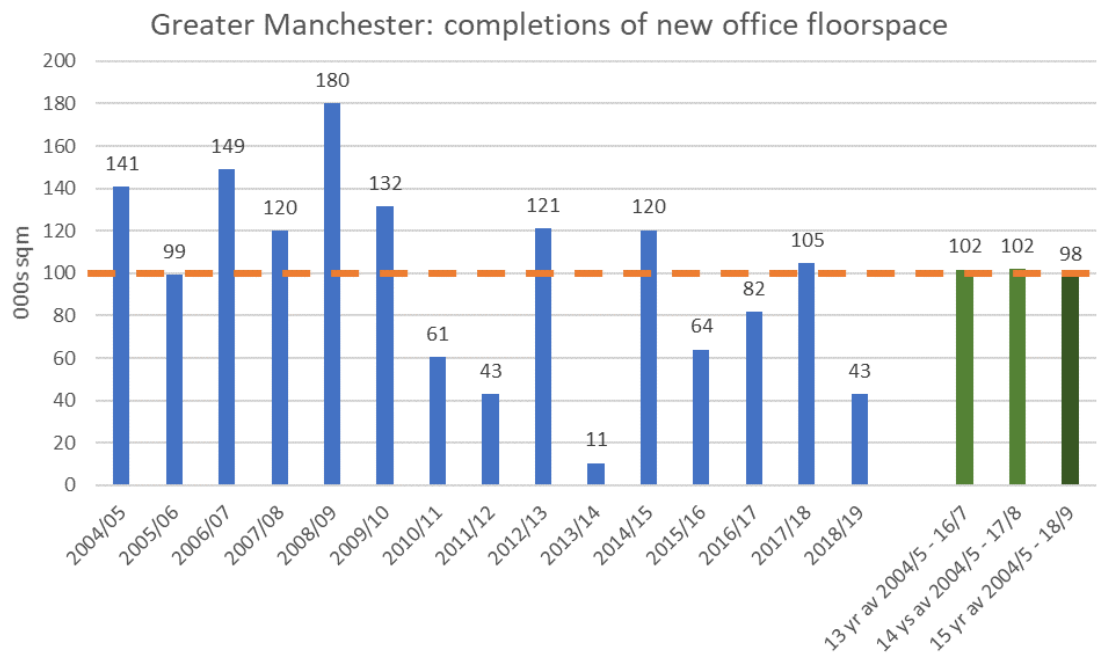
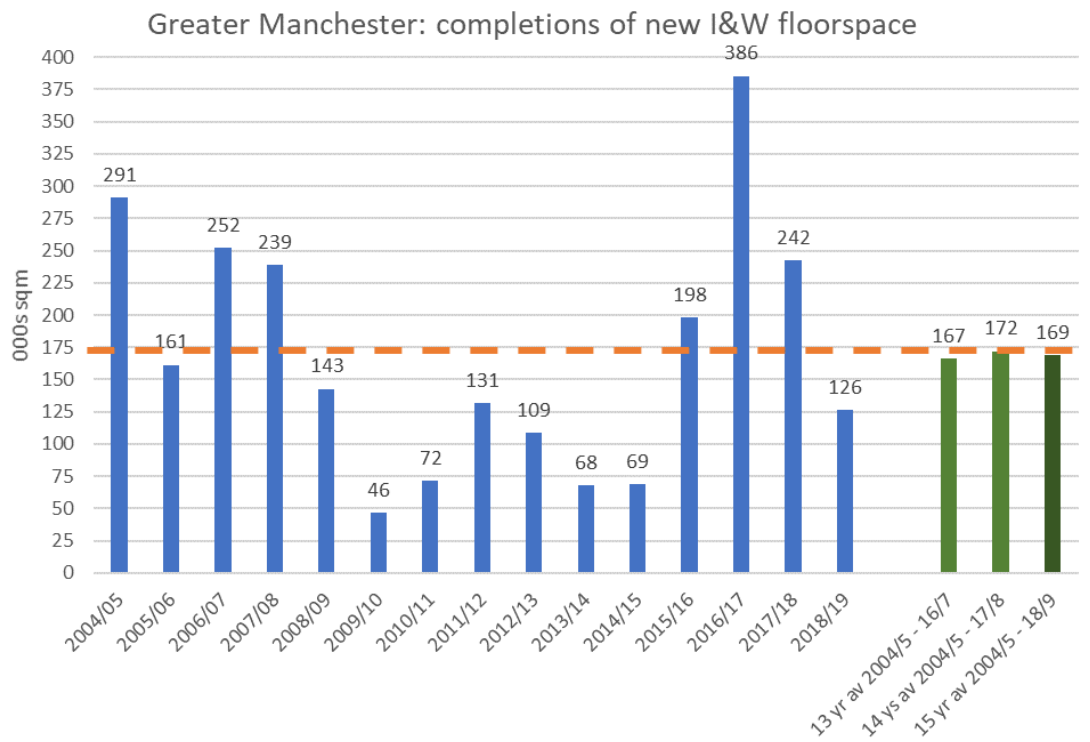


Figure 3.1: GM completions data trends, 2004/5 to 2018/19



Source: GMCA and individual district authorities

Updating the approach – weighting factor?

3.2 The rationale for this step was described in the January 2019 Topic Paper as reflecting "*consideration of the appropriateness of the historic time period has been made due to past trends incorporating a once in a generation UK recession and a weighting applied to account for atypical years*". We have two observations on this:

- First, the strength of the rationale for using any special weighting must diminish the longer the time period covered; the extent to which any one single year or groups of years impacts on the overall average gets smaller over time. Although, it is still undoubtably the case that the 2008 to 2012 recession was, in many respects, unprecedented.
- Second, to some degree every form of weighting is a bit arbitrary (as of course is applying no explicit weighting as this implicitly gives each year's data the same weight).

3.3 We have run the re-weighting exercise from 2018 and the results are set out in Table 3.1 below. As can be seen, applying each set of weightings has different impacts on office and I&W due to the pattern of timing of completions. The average of all weightings produces uplift factors which are similar to that in the Topic Paper (which were 1.6% for offices and 3.3% for I&W). The application of these new weightings leads to a weighted I&W figure which is very similar that in the January 2019 Topic Paper, however for offices the weighted figure is below that used previously.

3.4 The weightings used are set out in Figure A1 in Appendix A. They are very similar to those used in the January 2019 Topic paper, apart from the fact that there is an extra year so therefore all the weightings needed to be adjusted.

Table 3.1: Impact of weighting factors				
Weighting used	**Office**		**I&W**	
	Annual av. 000s sqm	% change on unweighted	Annual av. 000s sqm	% change on unweighted
Previous unweighted average*	*102.0*		*172.0*	
New baseline average (unweighted)**	**98.0**		**168.9**	
Weighting **recent** data	83.4	-14.9%	163.3	-3.3%
Weighting **past** data	110.2	12.4%	175.5	3.9%
Take out impact of **recession**	104.1	6.2%	195.2	15.6%
Average of recent and past only	96.8	-1.2%	169.4	0.3%
Average of all forms of weighting	**99.2**	**1.2%**	**178.0**	**5.4%**
Weighted figure January 2019 Topic paper	*103.6*		*177.7*	
Notes: * based on 14 years data to 2017/18; ** based on 15 year average 2004/5 to 2018/19				

4. Method 2. Employment forecast based

4.1 This section sets out the economic forecasts method. It starts with a consideration of economic forecasts and the implications for net demand for employment floorspace (paras 4.2 to 4.16). It then reviews and assesses the evidence on replacement demand (paras 4.17 to 4.35), before combining these two elements to produce overall assessment of future demand (para 4.36).

Analysis of economic forecasts

Summary of key points on economic forecasts

- We have used the AGS 2019 in this paper. This represents the latest forecasts for GM that are consistent with the ambition of the Northern Powerhouse. The rates of growth of employment are slightly below that over that last 15 year or so; however GVA growth is forecast to be stronger than historically. All forecasts need to be treated cautiously, nevertheless the rates of growth in AGS 2019 are not out of kilter with historic trends. The scenario is also, importantly, broadly consistent as between population, labour force and jobs growth.
- The scenario has stronger short term employment growth than longer term growth. This has implications for the impact of the particular time period chosen on the average rate of growth for any estimates of employment (and so employment space needed). Given the uncertainty over the timing of forecasts changes in employment in the period 2018 to 2020 in the GMFM, we have used the annual average figures for the whole forecast period to 2037 (ie 2018 to 2037) but applied to the period 2020 to 2037. This is because when the GMFM forecasts were made in the main reliable base employment data was only available for 2018.
- We have converted the AGS 2019 employment forecast to estimates of B Use Class floorspace using a set of assumptions that are fairly standard for these exercises. There is no one single correct way of attributing sectors to Use Classes nor for assessing employment densities. We have produced estimates using a range of approaches. In the final analysis we have used an average of these approaches to produce best estimates.

- The estimated overall net office floorspace requirements ranges is around 1.3 million sqm for the 17 year Plan period. So the application of jobs based floorspace need approach provides an estimate of need for floorspace for this growth scenario similar or close to the extrapolation of past (re-weighted) completions trends.
- The overall warehousing B8 I&W net floorspace requirement ranges from 1.3 to 1.5 million sqm for the 17 year Plan period and averages at around 1.4 million sqm. Given that employment is forecast to decline in the manufacturing sector, an employment based approach would lead to a large net fall in floorspace requirement from the manufacturing sector. However, there are several good reasons why this element is set aside and not netted off the warehousing/B8 forecast element.
- Adding in our best estimates of replacement demand, the forecast overall future need for offices is from 2.0 million sqm and for I&W the forecast is around 3.15 million sqm for the 17 year period.

The latest economic forecasts - AGS 2019

4.2 We have been supplied with the latest AGS 2019 forecasts. The results for the GM economy as a whole are summarised in Table 4.1 below. The key elements of the forecasts and comparison to the period 2004 to 2018 (which we have selected as it corresponds to the period for which we have completions data) are:

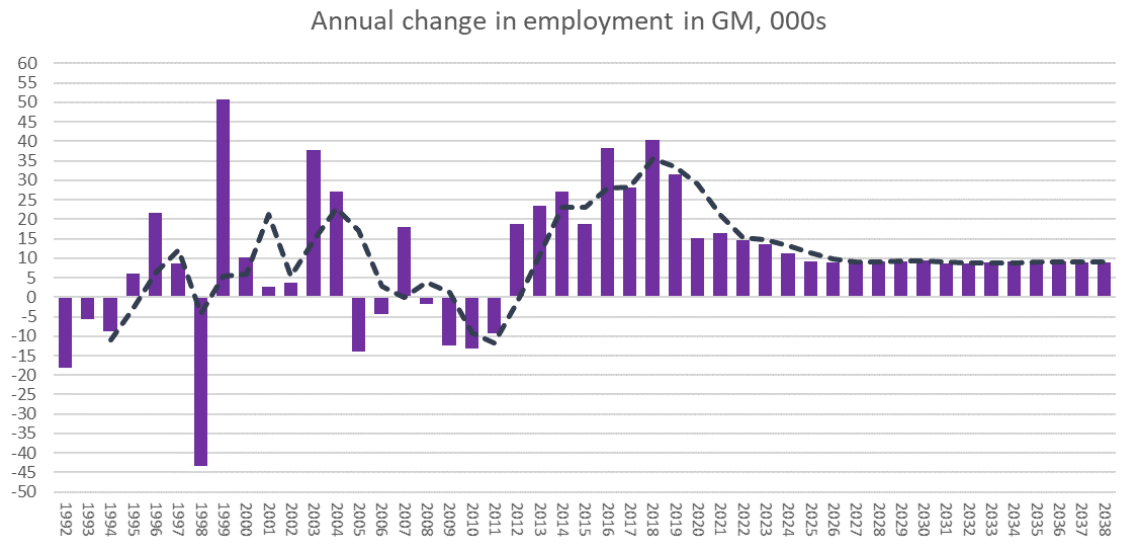
- The rate of growth of jobs overall is forecast to grow at a slightly slower rate than historically
- However, GVA and so productivity growth is forecast to be stronger. The rate of growth of labour supply is forecast to be slower than in the past but broadly in line with total increase in jobs.
- The period 2020 to 2037 sees a lower forecast absolute growth in employment (around 170,000 compared to 220,000) than the period 2018 to 2020. As Figure 4.1 shows the latest AGS 2019 forecasts assumes relatively rapid employment growth in the first few forecasts years which then slows thereafter. The figure also shows the degree of variability in historical movement in recorded annual employment change in GM, indicating that any year on year forecast must be treated carefully. Or put another way the broad shape of the forecasts are likely to be more robust than any year on year forecast change.

Table 4.1: Changes in key economic variables, GM economy

Measure	Type of change	Actual change	Forecast change	
		2004-2018	2018-37	2020-37
Jobs	Change 000s	158	220	173
	Change %	11.8%	15%	11%
	CAGR %	**0.8%**	**0.7%**	**0.6%**
GVA	Change %	22.7%	56%	50%
	CAGR %	**1.5%**	**2.4%**	**2.4%**
Productivity	CAGR %	**0.7%**	**1.6%**	**1.8%**
Labour supply	Change 000s	229	199	163
	Change %	18%	13.3%	10.6%
	CAGR %	**1.2%**	**0.7%**	**0.5%**
Working age population (16 to 64)	Change 000s	134	83.1	70.9
	Change %	8.1%	4.6%	3.9%
	CAGR %	**0.6%**	**0.2%**	**0.2%**
Total population	Change 000s	263	282	245
	Change %	10.3%	10.0%	8.6%
	CAGR %	**0.7%**	**0.5%**	**0.5%**

Source: Nicol Economics analysis of AGS 2019. Note: CAGR = compound annual growth rate

Figure 4.1: Summary of actual and forecast annual employment change in GM for the whole economy, 000s



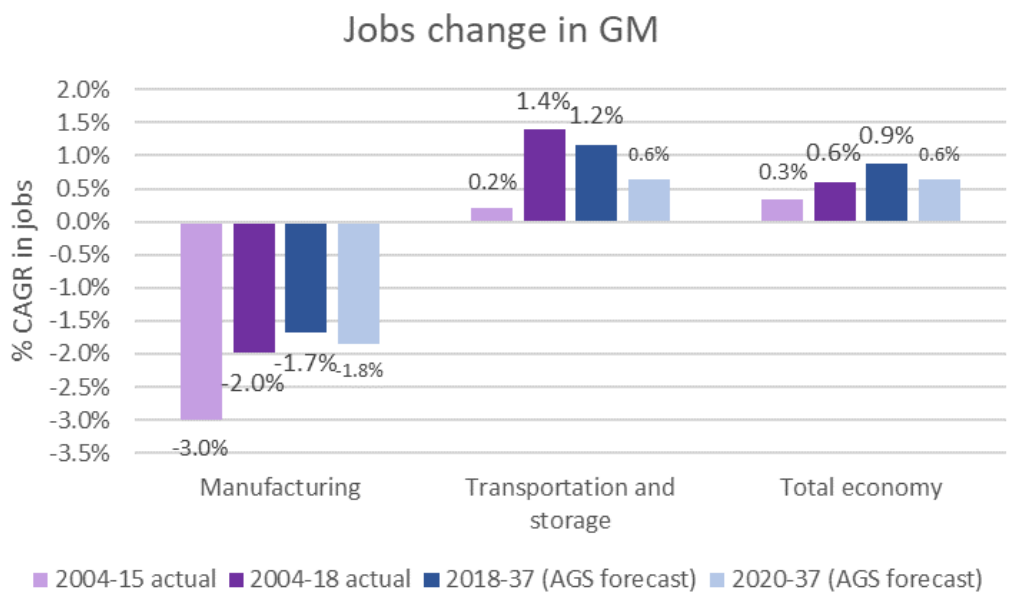
Source: Nicol Economics analysis of AGS 2019 forecasts. Note: trend line based on three year moving average

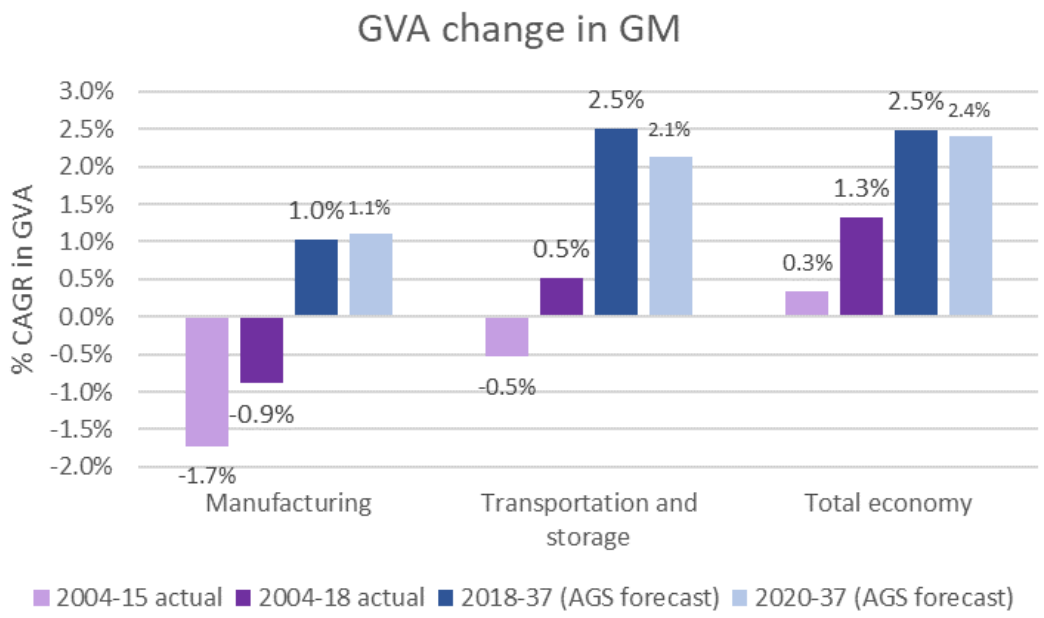
Comparison of past change to forecasts for I&W sectors

4.3 We have carried out a further analysis of patterns of historic and actual annual average changes in GVA and jobs for the I&W sectors. This is initially at a broad brush level for illustrative purposes. The analysis shows that:

- As with total employment, the rate of change is sensitive to the period chosen (the big differences between 2004 to 2015 and to 2018 reflects the relatively strong growth in the last few years after a period of relative stagnation as a result of the recession).
- As noted above the rate of forecast growth is sensitive to the assumed changes over the period 2016 to 2020. This is particularly true for the transportation and storage sector (the key sector driving demand for warehousing). The net rate of job creation over the period 2004 to 2015 was 0.2% per annum which rises to 1.4% pa over the period to 2018.
- For manufacturing the main message is that forecast rate of jobs decline is set to slow slightly, but that GVA growth is forecast to occur over either forecast period compared an historic decline.

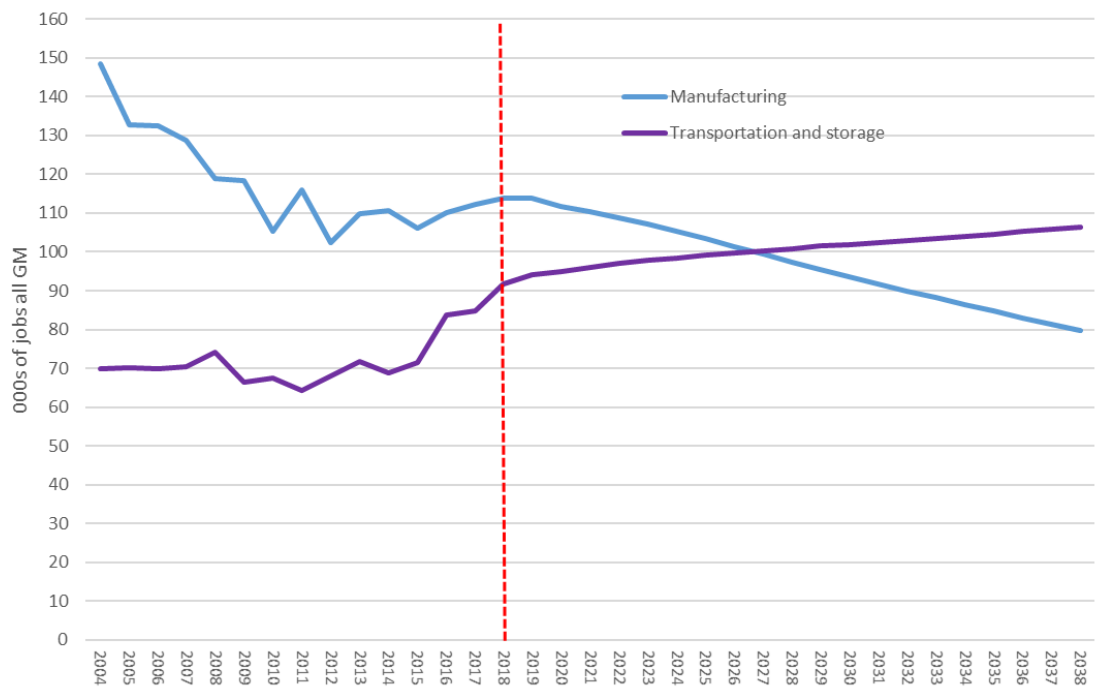
Figure 4.2: Annual average historic and forecast changes in jobs and GVA for manufacturing and transport and distribution sectors





Source: Nicol Economics analysis of AGS 2019 forecasts

Figure 4.3: Employment forecasts for manufacturing and transport and district sectors, all GM



Source: Nicol Economics analysis of AGS 2019 forecasts. Note: horizontal dashed line represents period from where estimates/forecasts are made in the GMFM

Converting the forecasts to an assessment of net demand for floorspace

Step 1: derive the appropriate employment change for each Use Class

4.4 There are different methods used to allocated jobs to floorspace in using employment change to derive change in need for floorspace. There is no one correct method for many sectors. So for instance most construction jobs do not require B Use Class floorspace (but are based on site), but of course construction firms do have offices and depots. Similarly the storage and transport sector includes jobs inside warehouses but also HGV and LGV drivers who are generally not included as part of the employment density calculations. The assumed changes in floorspace need are therefore sensitive to the assumptions made about whether jobs translate to the demand for floorspace and in what sectors.

4.5 The forecasts available for the AGS scenario are for 19 broad sectors and for the GMFM Baseline for the 19 sectors as well as a more detailed sectoral breakdown. An important issue is in the treatment of wholesaling (which is a sector driving demand for warehousing, but is lumped in with retail and motor vehicles which are non-B class uses in the broad sectors)[3]. Some models have been developed for very detailed sectoral forecasts. This has the advantage that the allocation of jobs to types of floorspace can be finer grained. However, it does mean that the modelling is even more sensitive to the detailed sectoral forecasts (where margins of error are inevitably higher than broader sectors).

4.6 We have adopted two approaches[4]:

[3] In the case of warehousing jobs we have assumed that these represent between 28% and 33% of the total change in jobs in the broader "wholesale and retail trade" sector .

[4] The detailed assumptions are set out in Table A4 in Appendix A

1) Method 1: a **broad brush** approach to allocation of jobs to use classes

2) Method 2: a **finer grained** approach[5].

4.7 However, it is important to note that, for jobs forecasts looking forward over a couple of decades, as well as the uncertainty around the robustness of the job forecasts, there is also **considerable uncertainty** over how jobs will be allocated to different land use classes. The results of this exercise are shown below in Figure 4.4. Given this uncertainty we have used the **average** of these two approaches in our assessment of employment driven needs.

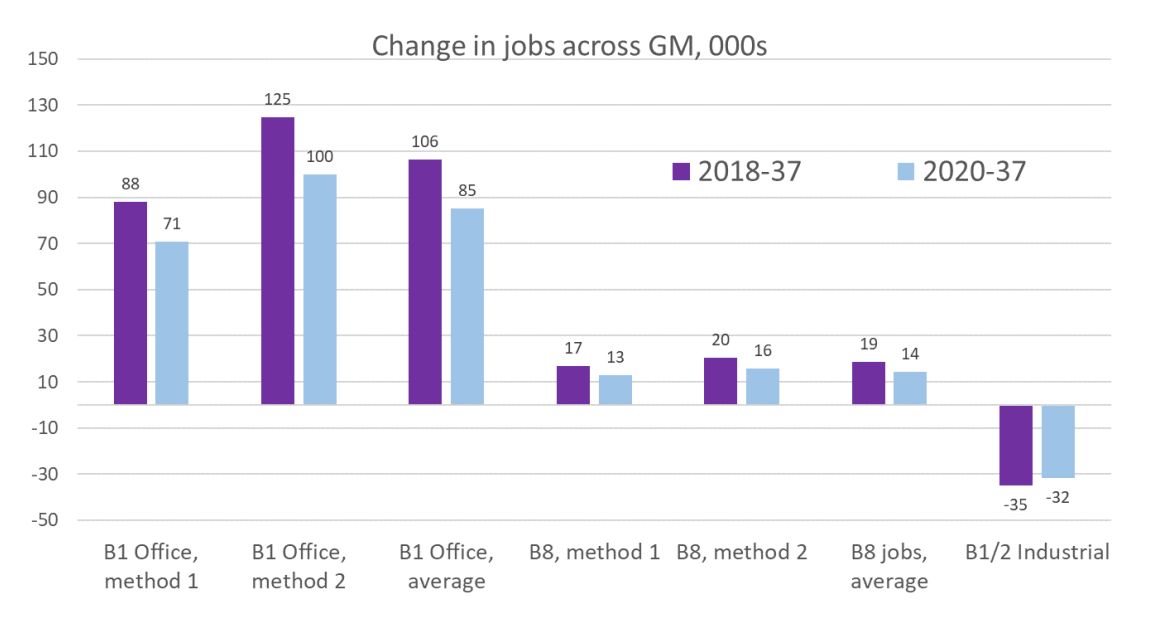
4.8 The forecasting period makes a difference to the overall change and the annual rate of change. For offices the annual rate of growth over the period 2020 to 2037 is 10% lower than for the period 2018 to 2037 whereas for warehousing it is 14% lower. One choice therefore is whether it is more appropriate to take the total change from 2018 to 2037 which is the current forecast period and **apply the annual average for this period** to reflect the uncertainty about assumed timing of employment change over the next few years. This is the approach adopted[6].

4.9 In some employment land exercises the two jobs-driven forecast elements of I&W need are added together. However, there are good reasons not to do this:

1) There are very different drivers of demand for B8 as opposed to B1/B2 industrial floorspace

2) There are also very different employment densities that are applied.

Figure 4.4: Estimated change in jobs by use class 2018 to 2037 and 2020 to 2037, AGS 2019 scenario



Source: Nicol Economics analysis of AGS 2019 employment forecasts

[5] Based on the allocations used by others in various employment land reviews

[6] In practical terms the forecast average annual levels of employment change are higher for the 19 year period 2018 to 2037 than the 17 year period 2020 to 2037 by 12% for office sectors and 17% for B8 sectors

Step 2: apply an appropriate employment density factor to the change in jobs

4.10 There is generally consistency in the employment densities used to assess office floorspace requirements (12 sqm of NIA floorspace per FTE job,, which translate to around 14 sqm per FTE job for GEA). There is more variation and choice for industrial and for warehousing. For the latter the HCA guidance has a wide range:

- National Distribution Centre, 95 sqm of GEA per FTE job
- Regional Distribution Centre, 77 sqm of GEA per FTE job
- 'Final Mile' Distribution Centre, 70 sqm of GEA per FTE job.

4.11 Clearly, the conversion of jobs to floorspace is fairly sensitive to the employment density assumed for warehousing. Much of the new warehousing development in GM in recent years has been high bay warehouses which are regional distribution centre, we have therefore used 77 sqm per job as the mid/lower range but tested the NDC density of 90 sqm per job, in part to reflect the growing trend towards greater automation in warehousing as the higher case. The main results use **a weighted average of these two approaches (2/3rd RDC and 1/3rd NDC)** to reflect a judgement about the trend towards larger automated warehousing operations.

4.12 It is important to note that the analysis assumes these employment densities **remain constant** over the forecasting period to 2037. However, there are significant structural economic changes which may alter these densities (potentially reducing floorspace per person employed in offices and increasing in I&W). We consider that for the proposes of this exercise this assumption about constant densities is not unreasonable.

4.13 As the GMSF forecasts are for **total jobs** they need to be converted to FTE jobs to be used with these employment densities. Business Register and Employment Survey (BRES) data accessed via Nomis for 2018 suggests that in GM for office sectors FTE jobs are around 89% of the total and for warehousing/B8 around 91% and we have used these conversion factors.

Step 3: Adjust for vacancy rates

4.14 A "normal" vacancy rate of 10% as been assumed for all types of property, which is common practice. This means that an extra 10% floorspace requirement is added on to that derived from simple application of employment densities to allow for vacancy to reflect market movements.

Step 4: Consider losses of employment land to other uses

4.15 In some ELRs an explicit addition is made to reflect the anticipated loss of employment land from a use class (and so need to replace it). This converts the employment change-based **net** demand to a **gross** need. The potential scale of this requirement was is explored below.

Results for net employment space need

4.16 Table A1 in Appendix A examines the implications of the latest **AGS 2019 scenario**. The results are:

- Before any uplift for "margin of error" the overall **office** floorspace requirements averages around 1.3 million sqm for the 17 year period.
- Before any uplift for "margin of error" the overall **warehousing B8 I&W** floorspace requirement averages around 1.4 million sqm for the 17 year period.

Analysis of replacement demand data

Summary of key points on replacement demand
• Replacement demand is significant in GM, especially for I&W, but it is hard to measure reliably.
• There has been a dramatic fall in the total stock of I&W floorspace over the last 15 years or so, at a much faster rate than most other parts England apart from the former industrial metropolitan areas. This decline has continued irrespective largely of levels of gross completions. However, much of the decline reflects industrial re-structuring and a move to a more efficient use of space and does not necessarily translate into the need for replacement demand.
• Our best estimate is that annual losses of office floorspace are running at around 36,000 sqm to 40,000 sqm per annum. Given the relatively close fit between office demand and occupancy, we would expect this almost all to be translated into replacement demand.
• We have identified that the range of potential replacement demand for I&W based on data from the last 15 years could be from 49,000 sqm to 161,000 sqm of floorspace per annum (or an average of 105,000 sqm). These figures range from 29% to 95% of the gross completions over that period, with the average at 62%.
• For I&W, replacement demand accounts for a very significant component of demand.

Introduction

4.17 We know that an important driver of the demand for employment land is the need to find new land to replace premises that are either: (1) no longer suitable for modern industrial and economic needs (by dint of location or nature of the site and space); or (2) have been lost to other uses (usually but not exclusively residential). Even if the overall demand for an aggregate quantity of floorspace in a sector is static or in some cases declining, there is often still need for new sites to be made available. This so-called **replacement demand** is rather hard to measure and, as we shall see, there is a fair degree of uncertainty around how large it is.

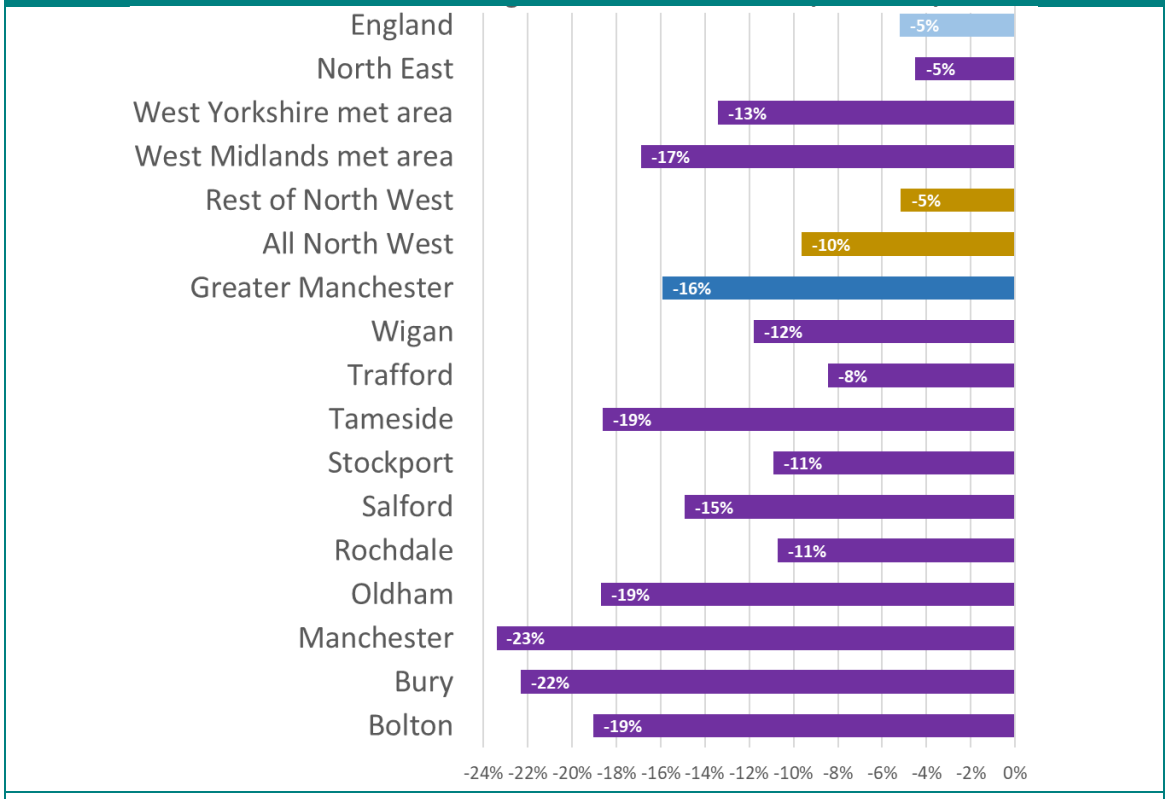
4.18 To use either the employment or GVA method of forecasting need also requires an estimate of the likely scale of employment land losses that may lead to replacement demand. We have two potential sources of information on these:

- A comparison of the data on gross completions as recorded by districts and the change in stock as measured by the Valuation Office Agency (VOA) for rating purposes
- Data provided by some but not all GM districts on the recorded losses (largely where there has been a change of use).

Change in business floorspace

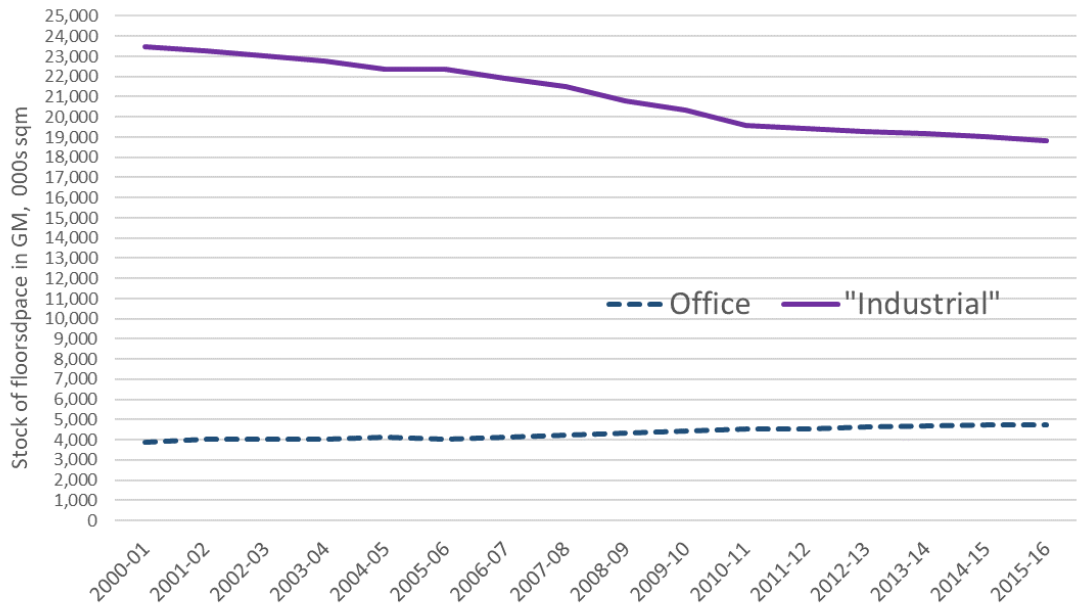
4.19 As can be seen from Figures 4.5 and 4.6 there has been a very considerable reduction in the overall "industrial stock" across GM. Over the whole period 2000/1 to 2015/16 the total stock of I&W premises across GM fell by 20% (4.46 million sqm), and over the period from 2004/5 to 2015/16 by 16% or 3.56 million sqm. The rate of fall in GM has been similar to other large metropolitan areas such as West Midlands and West Yorkshire, but a much faster rate of decline than nationally or in the rest of the North West (the fall for the North West was 10% overall and just 5% for all of the region excluding GM).

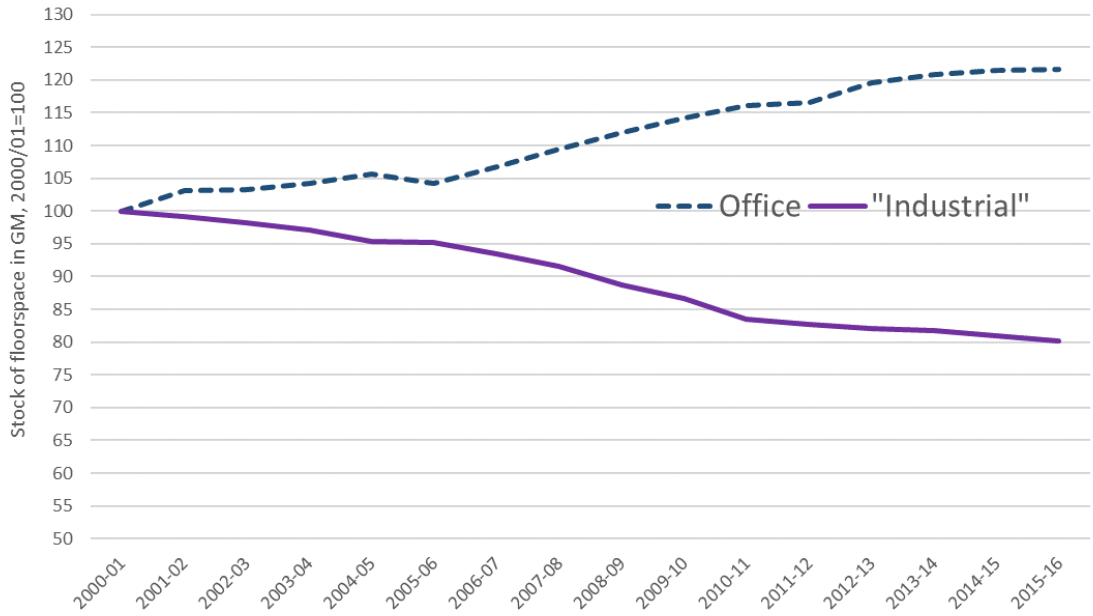
Figure 4.5: Change in overall stock of industrial floorspace, 2004/5 to 2015/16



Source: VOA Administrative Data as at 31 March 2016, analysed by Nicol Economics. Notes: (1) "industrial" includes warehousing as well as manufacturing; (2) 2015/16 is the most recent published data

Figure 4.6: Change in overall stock of floorspace, 2000/1 to 2015/16 all GM





Source: VOA Administrative Data as at 31 March 2016, analysed by Nicol Economics. Note: "industrial" includes warehousing as well as manufacturing

Comparison of completions and stock change data

4.20 We have compared the gross completions data with the VAO data on stock over the period 2004/5 to 2015/16 (as this is the period over which there is comparable data) in Table 4.2. This comparison is indicative only as:

- One data set covers property as defined for rating purposes (see Appendix A for what is covered by "industrial" uses), the other is as recorded by GM districts for planning purposes defined by Use Classes.
- There may be time lags between completions, additions, changes of use and deletions from the rating list.

4.21 Nevertheless, the data comparison suggests that for **offices** the increase in the overall stock is broadly consistent with the changes as picked up by completions (55% over this period). As we note below, excluding the more central areas of Manchester, Salford and Trafford (where losses to other uses especially residential are likely to be most significant), the ratio runs at 78%. Over the period covered the analysis suggests that, on average, there has been a loss of around 47,000 sqm of office floorspace either to other uses or because it has been demolished[7]. Over the period covered the average annual loss of offices is running at about 1.2% of the stock in each year. At the end of 2015/16 the recorded stock was 4,735,000 sqm so if the rate of losses continued this would be around **55,000 sqm per year**. However, it is clearly possible and indeed likely that the conversion of older office stock will slow down over time.

4.22 The data comparison for I&W produced rather different results. Over the period covered the analysis suggests that, on average, there has been a loss of around 480,000 sqm of I&W floorspace either to other uses or because it has been demolished (or approximately 10 times the rate for offices). Over the period covered the average annual loss of I&W stock is running at about 2.1% of the stock in each year. At the end of 2015/16 the recorded stock was 18,800,000 sqm so if the rate of losses continued this would be around **400,000 sqm per year**. However, as with offices it is clearly possible and indeed likely that the rate of conversion of older I&W stock will slow down over time as more and more of the older industrial stock is replaced and removed.

4.23 It should be noted that this analysis covers both industrial and warehousing space together and within the overall category that it is likely that the losses are driven more by industrial premises and new demand by warehousing. However, we are unable to separate out these different streams.

Table 4.2: Comparison of completions and stock data, 2004/5 to 2015/16 for whole of GM

Type of use		Office	I&W
Change in stock 2004/5-2015/16 (A)	Total	677	-3,972
	Annual average	**56**	**-331**
	%	17%	-17%
Recorded gross completions (B)	Total	1,241	1,780
	Annual average	**103**	**148**
Implied "losses" of existing stock = (B) – (A)	Total	564	5,752
	Annual average	**47**	**479**
	Annual rate of loss	1.2%	2.1%
	Extrapolated from 2015/16	**55**	**396**

Source: VOA Administrative Data as at 31 March 2016 and data from GM districts, analysed by Nicol Economics. Note: "industrial" includes warehousing as well as manufacturing

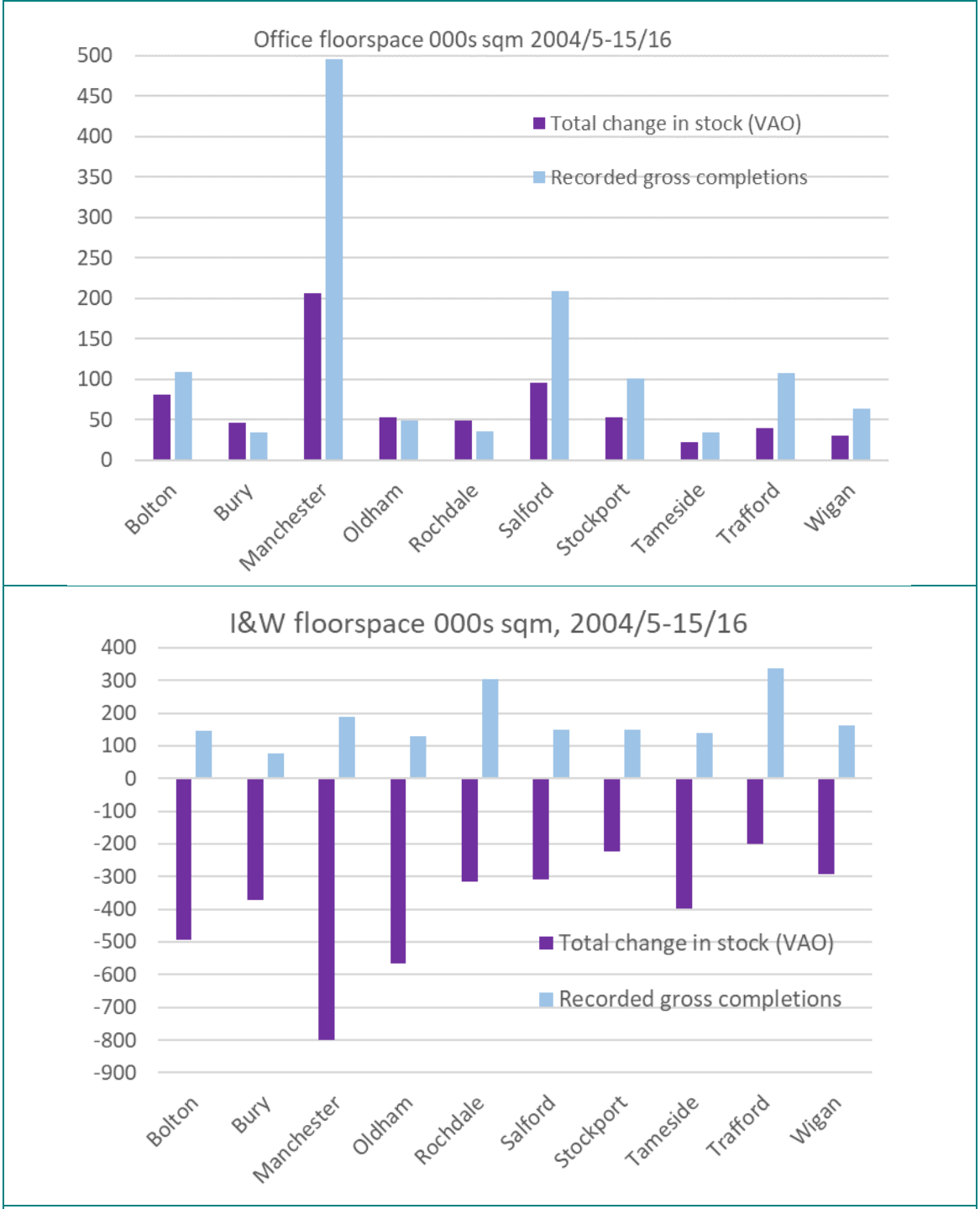
[7] Office space that is simply vacant would still be recorded as part of the office stock.

Figure 4.7: GM data on changes in stock of floorspace and gross completions 2004/5 to 2015/16

Source: VOA Administrative Data as at 31 March 2016 and data from GM districts, analysed by Nicol Economics. Note: "industrial" includes warehousing as well as manufacturing

4.24 We have also looked at the district by district change to see what patterns emerge. As can be seen the biggest difference in the recorded gross completions and change in stock for offices are in Manchester, Salford and Trafford – the areas where conversion of offices to other uses (eg residential or hotel) is most likely to have occurred. Excluding these three districts the recorded net change in stock of offices runs at 78% of recorded gross completions.

Figure 4.8: changes in stock of floorspace and gross completions 2004/5 to 2015/16 by district



Source: VOA Administrative Data as at 31 March 2016 and data from GM districts, analysed by Nicol Economics. Note: "industrial" includes warehousing as well as manufacturing

Recorded information on losses

4.25 Several GM district have been able to provide the GMCA with data on recorded losses of different types of land. This data has its limitations as:

- It covers seven districts[8] as not all districts record this information any longer (and Manchester's data does not cover the period for which there is VOA data)
- In some cases the data is recorded as losses of employment land (measured in hectares) which has been converted to floorspace by GMCA staff, whereas the data used in the rest of this analysis is about employment floorspace (000s sqm). The losses of employment land are not necessarily employment land in use but may of course be sites designated for employment use that are re-used for residential purposes.
- In some cases the data is separated by Use Class but in others it is not (although we know from the analysis above that in floorspace terms the losses are dominated by I&W, which will be even more the case for land areas given different densities).

4.26 We set out in Table 4.3 below the data for the six districts and compare this to the estimates of employment floorspaces losses from the previous approach. As can be seen there is considerable variation from district to district when comparing the results of the two approaches, with the district-based information running at 80% of the alternative method (Salford and Wigan) but at only around 40% for Bolton and Trafford (which may understate losses of office space as the monitoring focussed on land). Across the six districts the analysis suggests that the recorded bottom-up rate of losses of employment land/space is running at about 65% (two-thirds) of that suggested by the use of VOA stock and district completions data combined. Although, it should be noted, that the total losses data includes some office stock that is lost so we are not quite comparing like with like.

Table 4.3: District data on loss of employment space over period for which there is VOA data

District	Period	000s sqm of losses based on		Recorded as % of estimated (A/B)	Notes
		District data (A)	VOA /compl-etions (B) (1)		
Bolton	2010/11-2015/16	101	279	36%	Floorspace loss data only recorded since 2010/11. Covers all B Use Classes
Bury	2012/13-2015/16	110	69	158%	Floorspace loss data only recorded since 2012/13. Covers all B Use Classes
Man-chester	2016/17–2018/19				Record office and I&W separately. However, floorspace loss data only recorded since 2016/17 so cannot compare with VOA data
Salford	2010/11-2015/16	201	250	80%	Record office and I&W separately.
Tameside	2010/11-2015/16	104	214	49%	Record office and I&W separately.
Trafford	2012/13-2015/16	46	109	43%	Based on hectares of employment land lost to residential or retail development converted to sqm equivalent by GMCA
Wigan	2011/12 to 15/16	186	230	81%	Based on total hectares of employment land lost converted to sqm equivalent by GMCA
All 6 excl Manchester		**747**	**1,152**	**65%**	

Source: data from GM districts, analysed by Nicol Economics. Notes (1) for the relevant comparable period; (2) information not collected (or supplied) by Bolton, Salford, Tameside, Trafford and Wigan

[8] Bolton, Bury, Manchester, Salford, Tameside, Trafford and Wigan

4.27 We have also developed an alternative way of looking at the losses data from the seven districts who collect this which is set out in Table 4.4. This takes the average annual losses for the period covered by whatever data is collected (which can go back as far 9 years but in some cases only 3 years). We then gross up to a total GM figures based on these seven districts' shares of the total stock of either I&W floorspace or I&W and office floorspace. This gives suggested scaling up factors from the 7 to the 10 GM districts of 41% or 46% for I&W and 23% for offices[9]. The data for the seven districts suggests an annual rate of loss of all floorspace of around 185,000 sqm (which would be scaled up to 260,000 sqm to 270,000 sqm across all of GM). However, the data covers office space losses which are relatively significant in the case of Manchester and Salford, so when we strip out the likely losses of office stock as best we can, the figure for the seven districts for losses of floorspace runs at around 150,000 sqm or grossed up 215,000 to 220,000 sqm. For offices the estimate is around 40,000 sqm per annum.

Table 4.4: Straightforward annual average rate of employment land/space losses

District	Period	Number of years	Average annual rates of losses over the full period for each district (000s sqm)					
			Office	I&W	Both	I&W share*	Assumed only	
							I&W	Office
Bolton	2010/11 to 18/19	9			26	n/a	24	2
Bury	2011/12 to 18/19	8			15	n/a	14	1
Manchester	2016/17 to 18/19	3	14	11	25	46%	11	14
Salford	2010/11 to 18/19	9	9	23	32	73%	23	9
Tameside	2010/11 to 18/19	9	1	14	15	92%	14	1
Trafford	2012/13 to 18/19	7			10	n/a	10	1
Wigan	2011/12 to 18/19	8			61	n/a	56	5
Total 7 districts					**185**		**152**	**33**
Scaled up across total GM		Higher (46%)			**270**		**222**	**40**
		Lower (41%)			**261**		**215**	

*Source: Nicol Economics analysis of information provided by GM districts to the GMCA. Note: * based on Tameside share where not known*

Conclusions on losses of employment space

4.28 Taken in the round, both sources of data reviewed support the conclusion that, historically and indeed up the current day, there have been large scale losses of, particularly, premises (and so land) in existing use for I&W. However we have established that:

- The rate of losses varies strongly from year to year (although it appears as would be expected that the rate of losses were lower during the last recession when demand for residential and other uses was lower).
- Overall, a comparison of the two data sources suggested that extrapolating past trends the losses of existing floorspace to other uses of could be as high as around **55,000 sqm a year for office space** and **400,000 sqm a year for I&W taken as a whole** (covering losses to alternative land uses as well as the creation of new stock to replace older less desirable or usable stock). The rate of losses of I&W is of the order 10 times larger in absolute terms than that generated by offices.

[9] See Table A3 in Appendix A

- A comparison of the data from the six districts that is available (that account for around 53% of the estimated losses of employment land/premises across GM) suggests that the method based on using stock and completions data might overstate the actual extent of losses, alternatively the difference could be due to land becoming derelict rather than being demolished altogether. Across these six districts the "bottom up" recorded employment space losses run at around 65% of the top down assessment. This suggests an alternative estimate of **36,000 sqm per annum of losses for offices and 257,000 sqm per annum for I&W**[10].
- Finally, we have looked at a different approach that simply uses data on losses from the seven districts for which this is available (even though it covers different time periods in all cases). For these districts this suggests that for I&W annual average recorded losses may be running at around 150,000 sqm or grossed up across all of GM in the range **215,000 to 220,000 sqm per annum**. For offices the figure is **40,000 sqm.** These would represent an upper bound estimate of the rate of losses to consider assessing need.

4.29 We consider therefore that a starting point in forecasting the future rate of loses of employment floorspace would be:

- **36,000 to 40,000 sqm per annum for offices**
- **215,000 to 220,000 sqm per annum for I&W**[11]**.**

Application of the losses data

4.30 A particular challenge is how to interpret these forecasts or extrapolations of employment floorspace losses in assessing the future overall gross need for floorspace by sector. The key issue is that it is very hard to establish how far these losses of employment floorspace may need to be converted into replacement demand. The losses will reflect a range of complex factors, many linked to the restructuring of the economy.

4.31 In the case of the office sector it is a reasonable starting point that across GM most of the office stock is occupied[12]. As office stock is lost (often converted to residential use) this largely, but not entirely, needs to be replaced by new stock on a like for like basis. In other words, even if there was no net growth in office based employment forecast, then there would still be a need for new floorspace delivered to adjust for the losses of existing stock so long as the relationship between office-sector employment and floorspace continues. This assumption has been tested by comparing the total stock of office space from the VOA (for 2015/16) with the assumed occupation based on jobs and employment densities. The figures derived are compatible with the view that most office space is occupied and used.

4.32 This assumption cannot be made for I&W floorspace where there is a much looser "fit" between overall employment and floorspace across the sector. In other words, not all of the forecast losses of stock necessarily needs to be replaced by new stock (this is particularly true for industrial/manufacturing floorspace and sites). Indeed we can see that this must be the case as the absolute recorded loss of all forms of industrial floorspace based on VAO data (333,000 sqm per annum 2004/5-2015/16 (see Table 4.2 earlier) is considerably higher, indeed twice that, of average recorded gross completions (148,000 sqm per annum).

[10] Applying 65% to the figures in Table 4.2 of 55,000 sqm for offices and 396,0000 sqm for I&W

[11] We have not used the higher figure of 257,000 sqm per annum as this method appears less reliable than the bottom-up method

[12] There is a lack of robust vacancy data across GM. Commercial agent reports suggest a vacancy rate of 4.0% in the main Manchester office market (see for instance https://www.jll.co.uk/en/trends-and-insights/research/uk-big-6-report-h2-2019)

4.33 Unfortunately we do not have any detailed breakdown of the types of losses of floorspace (as between industrial and warehousing uses). Therefore we have to make some reasonable assumptions on what the scale of replacement demand might be in the future. In other words we need to establish what share of losses of the current stock I&W space need to be replaced to meet existing demand. In some studies a form of explicit discounting (25% to 50%) is used to historic losses data[13] to account for the fact that some historical losses will reflect restructuring in the economy and a move towards a more efficient use of land and premises in the economy. To take the more modest end of this range and applying a 25% "discount" would lead to a figure of 161,000 sqm per annum (75% X 215,000 sqm).

4.34 To help assess what this level might be we have also looked at the historic gross completions rate and re-modelled demand from just the warehousing sector over the period 2004/5 to 2018/19 (based on the method set out in the next section - see para 4.4 to 4.16). This analysis suggests that if all gross completions and net need were generated by the warehousing sector (as over this period there was a strong loss of both employment and GVA in the manufacturing sector) then this would leave around 50,000 sqm per annum of replacement demand (either for lost B8 or B1/B2 space). There is inevitably uncertainty around this estimate, but it suggests that as a minimum around 30% of gross demand over this period was likely to be replacement demand.

Table 4.5: Re-working of past historic demand

000S sqm	Total I&W need 2004-2018	Annual average
Gross completions	2,534	169
Less, historical assessed B8 need*	1,804	120
Residual = replacement demand	730	49

*Source: Nicol Economics analysis. Notes: * based on assessed mid end of assessed warehousing/B8 demand using the methodology to forecast future need*

4.35 We therefore have a wide potential range of future replacement demand needs for I&W from around 215,000 sqm per annum at the top end (discounted to down 161,000 sqm) to 49,000 sqm using the re-estimation of past demand. The best figure is likely to lie between these two estimates. We have therefore taken the **simple average of the two methods for the basis of the assessment of gross demand in the next section**.

Table 4.6: GM future estimated replacement demand - summary

000S sqm		Annual	Total 17 years
Office	*Lower*	36	605
	Higher	40	687
	Average	**38**	**646**
I&W	*Lower*	49	827
	Higher	161	2,740
	Average	**105**	**1,784**

Source: Nicol Economics analysis

[13] For instance see: Employment Land Forecasting Study, Nottingham Core HMA and Nottingham Outer HMA, NLP, July 2015 (used 50% for Nottingham City) or Hull Employment Land Review Final Report Hull City Council June 2014 (uses 66%)

Combining employment growth and replacement demand

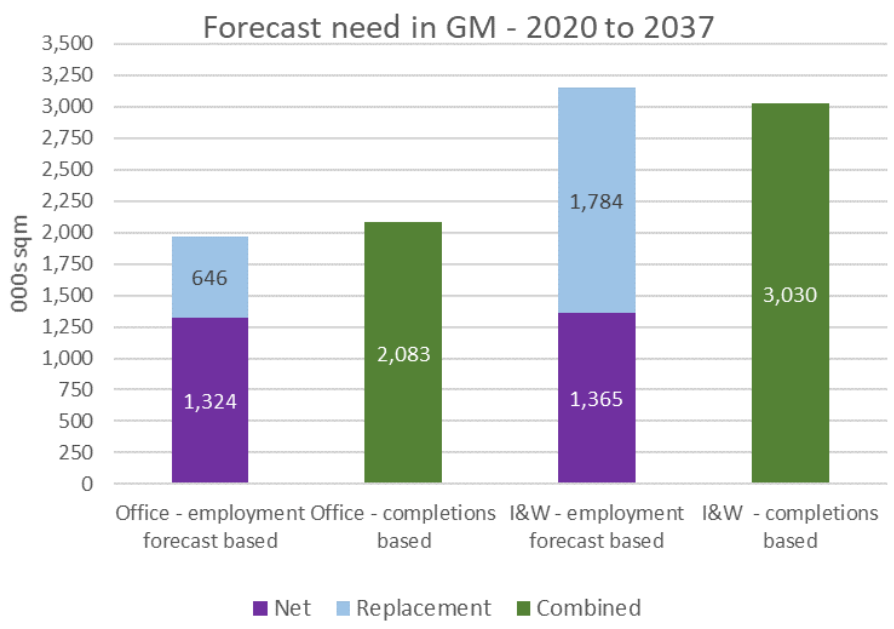
4.36 We have drawn together the estimates of net demand from economic change and replacement demand below (with the detailed results in Table A2 in Appendix A). For offices the estimate is 2.0 million sqm for the 17 year period and for I&W the estimate is 3.15 million sqm for the 17 year period. For the estimates for I&W floorspace it is worth re-iterating that:

1) The net forecast demand is derived purely from forecast employment change in the B8 sector. The forecast employment reductions in manufacturing are not netted off this figure. There are several reasons for doing this:

- Although an employment based approach would suggest a major negative net demand for manufacturing floorspace we note that, unlike the last 15 year period, strong GVA growth is forecast and to the extent that this increases the demand for floorspace linked to manufacturing output this could offset the employment trends.
- Any release of land as a result of a reduction in manufacturing activity is not necessarily going to lead to a release of land and certainly not a release of property for warehousing use.
- The historic comparison of fall in stock, jobs in manufacturing and gross completions provided no evidence of re-cycling and re-use of former manufacturing land and premises for warehousing use.

2) There is considerable uncertainty around the scale of the future replacement demand driven needs. As can be seen from the Figure 4.9 below our best forecast of this element account for well over half the future source of gross demand for I&W space. We have used an average figure from two approaches. If we used the extreme ends of the range this could add plus or minus of the order of 1 million sqm of need for I&W space.

Figure 4.9: Net employment land need based on employment forecasts (and completions)



Source: Nicol Economics analysis of AGS 2019 employment forecasts

5. Overall assessment including a margin allowance

Appropriate use of a margin

5.1 The norm in employment land reviews is to add some further uplift factor often called a "**buffer**", "**margin of choice**" or "**safety margin**". These buffers tend to be expressed either as a % or more normally as a number of years supply. Typical figures are 10% to 20% or 2 to 5 years' worth of annual need (for a 20-year Plan period).

5.2 The figure of two years is sometimes described as based on "*an allowance to reflect the average time for a site to gain planning permission and be developed*[14]". So in this context it is very much a supply-side margin. Such an approach might of course not be appropriate if the supply consists of large and complex new land allocations with significant development implementation action needed to bring them forward (as is the case for some of the proposed GMSF allocations).

5.3 It should be noted that there is no clear central government guidance on what scale of buffer there should be and what is an appropriate range. Logically, the need for an overall need buffer might be somewhat lower for a larger geographical area (such as GM) as there is inherently more choice so long as businesses are prepared to be flexible about location.

5.4 The need for such a margin is often described as providing for some flexibility to allow for:

- Potential margin of error associated with any forecasting process
- Choice of sites to facilitate competition in the property market
- Some level of vacant floor space within functioning markets
- Flexibility to allow for any delays in individual sites coming forward.

5.5 It is important that there is no overlap between the concept of a margin applied to demand/need and that which might be applied to supply. It is also the case that this concept of the margin is not designed to deal with any assumed inadequacies in the quality or realism of the assessed supply. In other words, the margin is not designed to adjust for any inadequacies in supply apart from the "normal" time delays in delivering new developments.

5.6 There is no consistency across employment land studies as to how large the margin should be[15]. The minimum generally used is two years of need (or looked another way the annual supply required to meet the assessed need) but many studies include five years of supply. In percentage terms these margins of course depend on the period for which provision is being made, the longer the plan period the greater the number of years of margin that would be appropriate. Table 5.1 shows a four year would equate to an effective 24% uplift and a five year margin a 29% uplift for a 17 year period.

[14] This approach is sometimes quoted as it is based on rather dated guidance from the now defunct South East England Planning Partnership Board "Economic and Employment Land Assessments Supplementary Guidance Consultation Document", 2009

[15] Different research and consultancy firms adopt different approaches and these may also vary across time

Table 5.1: Margins expressed in different ways	
	Plan Period
	2020-37
Number of years of plan	17
Margin in years of supply/need	Margin as a %
2	12%
3	18%
4	24%
5	29%

5.7 In the January 2019 GMSF Employment Topic Paper the view was taken that it was possible to apply a margin of demand covering:

- Any **unforeseen increase in demand** for land (i.e. a margin of error linked to the inherent uncertainty of any forecasts of need)
- Aspirations to increase the **overall size and competitiveness** of the GM economy and
- Accounting for demand which may have been **suppressed by a lack of supply**.

5.8 This margin was set at 25% (reflecting the top end of margins used elsewhere). In addition a further margin of 20% was applied to the assessed supply. In effect this amounted to a 50% combined margin (1.2 X 1.25) which was subject to some criticisms during the consultation stage as both relatively large and not fully justified.

5.9 We have reviewed the approach to the margin and note the following:

- The new forecasts of need take account of the AGS 2019 forecasts which themselves include the aspiration to reflect an increase in the size and competitiveness of the GM economy
- The employment-based estimates are less likely to be suppressed by past lack of supply (although there may be some issues)
- The issue of uncertainty remains
- A combined need and supply margin of 50% falls well outside the bounds of what has been generally used elsewhere (up to around 25% or at most 5 years of supply).

5.10 We consider that across <u>both</u> demand and supply an overall margin of around 25% is justifiable (over 4 years' worth of supply over a 17 year plan period). This could be thought of as two years' worth of supply as a minimum to reflect rigidities in the delivery of supply, plus two to three years to reflect the uncertainty over the forecasting of need. Having carried out further data analysis it is clear that there are uncertainties in all forecasting methods:

1) For the past completions approach a key issue is that the rate of economic growth (jobs and especially GVA) for some sectors contributing to employment need is forecast to be stronger than in the past – this is especially true for manufacturing. Therefore this approach may understate future need without a further margin.

2) We have not used the top end of potential future replacement demand need rather a mid-range figure. Again, it is possible that future need is therefore being understated.

5.11 We consider there is a finely balanced argument as to whether a 4 or a 5 year margin is more appropriate and so show both.

Final overall assessment

5.12 The final result of the assessment are set out in Table 5.2 below. The range of figures for **offices** are 2.1 to 2.5 million sqm for the 17 year Plan period (compared to the 2.46 million sqm in the January 2019 Topic paper for the then 19 year Plan period). The higher end of the range is somewhat above the 2019 Topic paper figure on an average annual basis, this reflects the use of a forecasting based method coupled with an element of replacement demand.

5.13 For **I&W space** the assessment produces a range of 3.7 to 4.1 million sqm of space needed. As noted above there is particular uncertainty around the employment forecast based method figures due to the difficulties of assessing replacement demand.

Table 5.2: Greater Manchester, estimates of future floorspace needs

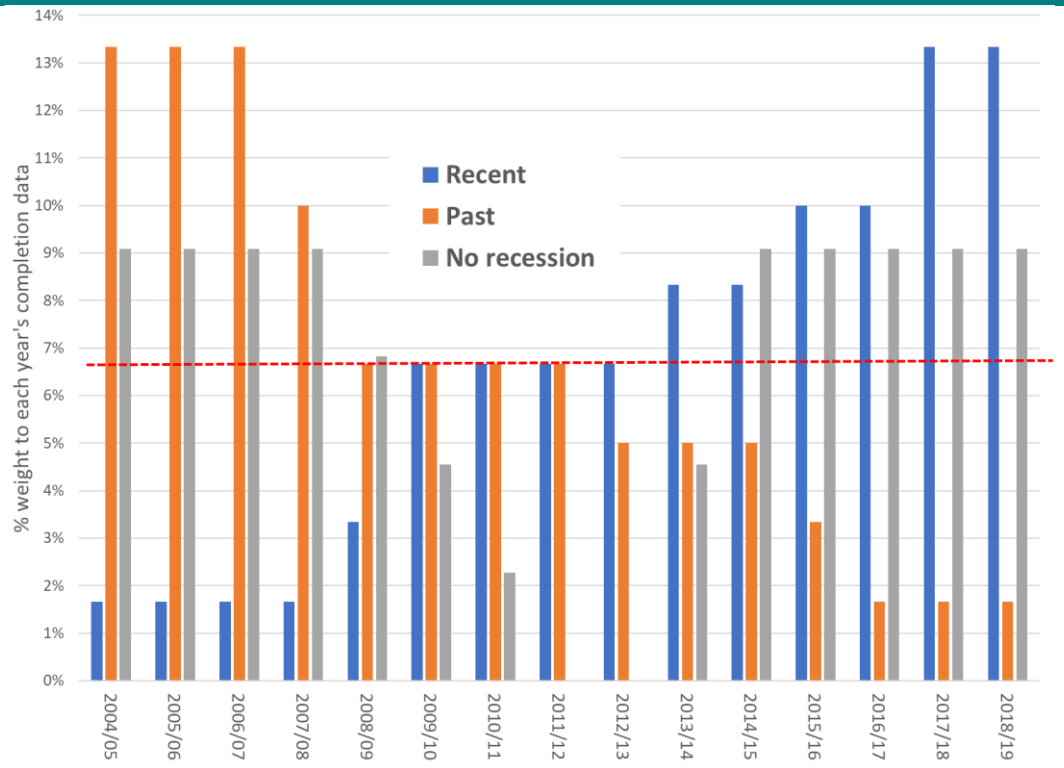
	Office		I&W	
	Past completions based	Forecasts based*	Past completions based	Forecasts based*
Net need		1,324		1,365
Replacement need		646		1,784
Total gross need	1,687	1,970	3,030	3,149
Total annual average	99	116	178	185
Add margin (4 years)	*397*	*463*	*713*	*741*
Total overall	2,083	2,433	3,743	3,890
Total rounded	**2,100**	**2,400**	**3,700**	**3,900**
Total annual av. inc. margin	123	143	220	229
Add margin (5 years)	*496*	*579*	*891*	*926*
Total overall	2,183	2,549	3,921	4,075
Total rounded	**2,200**	**2,500**	**3,900**	**4,100**
Total annual av. inc. margin	128	150	231	240

Source: Nicol Economics calculations. Note: the 2019 Topic paper figures of assessed need were 2.46 million sqm for offices and 4.22 million sqm for I&W for the then 19 year Plan period

Nicol Economics, April 2020

Appendix A : Key Workings and Data Tables

Figure A1: Weighting factors 2004/5 to 2018/19



Note: the red dashed line is the equal yearly weighting line

Table A1: 2019 AGS scenario - implications for employment floorspace need 2020 to 2037

		All	B1 Office	B1/2 I&W	B8 I&W	Non-B Class
		000s	000s	000s	000s	000s
Employment change 2018-37						
Total change in jobs detailed method		219.8	87.9	-34.9	16.7	150.1
Total change in jobs high level apportionment		219.8	124.8	-32.4	20.5	107.0
Average		219.8	106.3	-33.6	18.6	128.6
Annual average		11.6	5.6	-1.8	1.0	6.8
Applied over 17 years 2020 to 2037		**196.7**	**95.1**	**-30.1**	**16.6**	**115.0**
Convert to floorspace						
FTE jobs			89%	96%	91%	
Sqm NIA per job			12.0			
Sqm GEA per job		Mid	14.1	40	77	
Sqm GEA per job		High	14.1	50	90	
Vacancy rate			10%	10%	10%	
Implied floorspace needed	Mid		1,324	-1,280	1,292	
	Higher		1,324	-1,600	1,510	
	Simple average		**1,324**	-1,440	**1,401**	
	Re-weighted average for I&W*		1,324	-1,440	1,365	
Average annual			78	-85	82	

Source: Nicol Economics calculations. Note: weighted 2/3 to Mid and 1/3 to Higher figure

Table A2: Forecasts based using annual average forecasts employment change and so need for 2018-2037 applied to 2020 to 2037

	Office	I&W
	Forecasts based	Forecasts based
Net need	1,324	1,365
Replacement need	646	1,784
Total gross need	1,970	3,149
Total annual average	116	185
Number of years margin = 4 years	4	4
Add margin	463	741
Total overall	2,433	3,890
Total rounded	**2,400**	**3,900**
Total annual average inc margin	143	229
Number of years margin = 5 years	5	5
Add margin	579	926
Total overall	2,549	4,075
Total rounded	**2,500**	**4,100**
Total annual average inc margin	150	240

Source: Nicol Economics calculations

Table A3: Shares of I&W and Office stock by district

District	I&W Stock in 2011/12, VAO		Office stock (011/12)	All stock (office and I&W)	
	000s sqm	share of GM total	000s sqm	000s sqm	share of GM total
Bolton	2,076	11%	305	2,381	10%
Bury	1,090	6%	146	1,236	5%
Manchester	2,308	12%	1,921	4,229	18%
Salford	1,799	9%	183	1,982	8%
Tameside	1,752	9%	152	1,904	8%
Trafford	2,175	11%	506	2,681	11%
Wigan	2,197	11%	467	2,664	11%
All 7 district (A)	**13,397**	**68%**	**3,680**	**17,077**	**71%**
Oldham	2,297	12%	129	2,426	10%
Rochdale	2,321	12%	518	2,839	12%
Stockport	1,560	8%	209	1,769	7%
	6,178	**32%**	**856**	**7,034**	**29%**
All GM (B)	**19,575**	**100%**	**4,536**	**24,111**	**100%**
Scaling factor (B/A)		**146%**	**123%**		**141%**

Source: Nicol Economics analysis of VOA data

Table A4: Allocation of Jobs by Sector to use Classes

Sector	Method 1: Finer tuned apportionment share				Method 2: High-level apportionment share			
	Non B Class	Office	I&W		Non B Class	Office	I &W	
			Industry	Ware-housing			Industry	Ware-housing
Agriculture, forestry & fishing	100%				100%			
Mining & Quarrying	100%				100%			
Manufacturing			100%				100%	
Electricity, gas, steam and air	17%		83%		100%			
Water supply	17%		83%		100%			
Construction	100%				100%			
Wholesale and retail trade	69%			31%	67%			33%
Transportation and storage	24%			76%				100%
Accommodation and food service	100%				100%			
Information and communication		100%				100%		
Financial and insurance		100%				100%		
Real estate activities		100%				100%		
Professional, scientific and tech		100%				100%		
Administrative and support	76%	24%				100%		
Public administration and defence	90%	10%				100%		
Education	100%				100%			
Human health and social work	100%				100%			
Arts, entertainment and rec	100%				100%			
Other service activities	100%				100%			

Table A5: Use Classes for Rating Purposes included in VOA "Industrial" Rating Data	
Industrial	Abattoirs & Slaughterhouses
Industrial	Agricultural Research Centres
Industrial	Animal Breeding Centres
Industrial	Baling Plants
Industrial	Brickworks, Clay Tile/Pipe Works
Industrial	Bus Garages
Industrial	Cement Tile Works
Industrial	Cold Stores
Industrial	Concrete Works
Industrial	Contractors Huts & Compounds
Industrial	Creameries
Industrial	Distilleries
Industrial	Factories, Workshops & Warehouses
Industrial	Food Processing Centres
Industrial	Foundries
Industrial	Garages
Industrial	Granaries & Intervention Stores
Industrial	High Tech Warehouses
Industrial	Industrial Miscellaneous
Industrial	Large Distribution Warehouses
Industrial	Large Industrials
Industrial	Newspaper Printing Works
Industrial	Pack Houses
Industrial	Paper Mills
Industrial	Post Office Sorting Centres
Industrial	Potteries
Industrial	Provender Mills (National Scheme)
Industrial	Scrap Metal/Breakers Yard
Industrial	Stores
Industrial	Tanneries
Industrial	Vehicle Testing Centres
Industrial	Wafer Fabrications
Industrial	Warehouses
Industrial	Waste Transfer and Recycling
Industrial	Workshops