GREATER MANCHESTER

DOING THINGS DIFFERENTLY FOR OUR WORKFORCE

Industry Labour Market and Skills Intelligence Report

Manufacturing

Published January 2021

PURPOSE OF REPORT

This report provides an employer led and current understanding of skills and talent needs required across our Manufacturing business landscape in Greater Manchester (GM). The intelligence has been gathered from conversations with a large variety of sources including existing employer networks and sector bodies, Universities, MIDAS, the Growth Company, Local Authorities, and national manufacturing and engineering skills facilitating organisations. GMCA would like to thank everyone involved in the development of this report for their time and insights.

The report is intended for a large variety of stakeholders to support in understanding the skills and talent needs within our regional manufacturing industry. Recommendations made will not necessarily lead to GMCA led work and skills activity. They are intended to help summarise and support stakeholders to understand where their actions may fill gaps and support talent development for the industry. Advanced Manufacturing is identified as one of the 4 key sectors for Greater Manchester in the Local Industrial Strategy (published June 2019). This report supports and feeds in to wider GMCA policy and strategy including:

- Greater Manchester Strategy
- Greater Manchester Local Industrial Strategy
- Greater Manchester COVID Recovery
- Greater Manchester Work and Skills Strategy

GMCA will coordinate wider dissemination and translation of this intelligence for different audiences in GM. Additionally, GMCA will look across devolved powers in the work and skills team and wider authority to see where objectives, projects, and activity can better align based on this intelligence. The overall vision for this work is to be a key contributor in developing a fully aligned labour market response in GM where there is credible, current, employer led and shared understanding of the jobs, talent, and competencies employers need across our Local Industrial Strategy (LIS) frontier and foundation sectors.

The report sets out an overview of the intelligence available relating to the skills required to meet our Manufacturing Sector requirements across Greater Manchester. The objectives of this intelligence are as follows:

- Provide a better understanding of the progression pathways to roles within the Manufacturing sector in GM.
- Identify which occupations need to be prioritised.
- Better inform and implement existing skills provision for the benefit of GM residents and Manufacturing employers.
- Identify opportunities for the skills system to increase the available pathways for new entrants and upskilled/reskilled workers into priority occupations needed.
- Understand the future trends within the Manufacturing sector – in particular, how these trends will impact the existing workforce and future skills needs.
- Understand the impacts of COVID19 and Brexit on the skills-base within the sector, including challenges and opportunities.

GM residents need to be able to understand the occupations and progression pathways as well as the technical skills and wider competencies and attributes required in different areas of the industry and at different levels. There is the need for

key stakeholders working with different groups to be able to translate these key skills and labour market messages for the following groups:

- Young people
- Influencers – teachers, parents, careers advisors and work coaches
- People looking to switch careers or looking for work
- Skills providers of all types
- Employers
- Individuals wanting to progress in work

This intelligence was gathered in late 2020 and is accurate as of the release date of this report. The report is intended as an initial platform of intelligence and research, which will be built on and updated by GMCA. Upcoming developments in the COVID-19 pandemic and the UK's withdrawal from the EU will continue to shift the economy. These shifts, in addition to new technological developments evolving at a rapid pace will have large and long-lasting impacts on the Manufacturing sector. GMCA understands the need to regularly update this intelligence accordingly. Plans are laid out towards the end of the report for further intelligence gathering and research – these will be formalised in an action plan in early 2021.

EXECUTIVE SUMMARY

With the sector identified as a key industrial sector for both the UK-wide and GM economy, support for Manufacturing is of increasing importance. This report looks primarily at how the skills challenge in Manufacturing is met within Greater Manchester, to inform and guide better responses from GMCA, local authorities, employers, providers, and other stakeholders.

Key findings from this report include:

- Manufacturing is an **important sector for GM** employing over 100,000 people. Employers in the sector are particularly important for the workforce in a few of the local authority areas – primarily Wigan, Rochdale, Bolton, and Oldham.
- Colleges, universities, and private providers deliver programmes for the sector that **generally meet the skills demand** for technical professions. There are some in the sector who would prefer to see big courses broken up so individual elements of them can be accessed for staff who don't need the full qualification.
- Apprenticeships are **well respected as an entry route** for young people into manufacturing – there is a long-standing tradition of "learning on the job". However, there are many who have not yet started using the newer Apprenticeship Standards.
- There is a feeling within the sector that **manufacturing is not perceived as an exciting sector** for career progression. Employers feel like they are missing out on the top talent.
- There are skills gaps in the following areas:
    - **Management** – Staff are often promoted into management positions and not given any formal training on the principles of good people management. As a result, management styles tend to be production-led rather than people-led.

    - **Specific technical areas** – Certain sectors see persistent skills gaps in roles that are new or difficult – these roles often require high-level niche skillsets. Advanced materials (because many experts are in academia) and Welding (because the roles are difficult and demanding) are good examples.
    - **Digitalisation** – While digitalisation is a trend in all industry sectors, Manufacturing is facing a system-wide shift. Trends towards "Industry 4.0" are accelerating. All businesses in the sector will be exposed to this (if not already), over the next few years. Understanding and maximising the use of the new technology requires specialist skills covering areas like data analytics, additive manufacturing, and automation.
    - **Sales and Marketing** – At SME level, there is a poor understanding of the basic principles of sales and marketing. The pandemic has impacted traditional networks and many businesses are trying to find new ways to generate orders.
- Trends in the sector point towards **increased electrification, automation, and digitalisation**. Larger employers have responded to this faster than the SME market, but the trend will touch all organisations over the next few years.
- Manufacturing has seen a **mixed impact from the COVID-19** pandemic. Some have seen orders drop and have made redundancies, but others are busier than ever and struggling to meet demand. Many have had to make allowances for social distancing guidelines.
- Despite improvement in recent years, **diversity and demographics remain challenges** for the sector – women and BAME workers in many roles are rare, and the average age of workers is above most other industries.

RECOMMENDATIONS

Full and detailed recommendations are given at the end of this report, but a list of the core recommendations can be found below. These recommendations are not likely to be short-term fixes, and several require a long-term culture change around the sector. They act to summarise key areas of activity based on the greatest need – activity which will need input from all corners of the sector, including employers, skills providers, schools, local government, and sector bodies. A full action plan will be produced in early 2021.

Key recommendations from this report include:

1. Commissioning activity should take place to fill **immediate skills gaps in management, digitalisation, and sales/marketing**. Programmes meeting this need should be short (8-12 weeks), face-to-face where possible, and facilitate mixing of businesses.

2. Progression routes, potential future careers, and **occupation pathways should be made clearer** and linked to formal qualifications, to improve transparency for existing staff. Work with business networks to **increase number of STEM Ambassadors** across Greater Manchester

3. Build **better and more valuable links between local employers and schools** to dispel myths and improve reputation of the Manufacturing sector. In particular, role models from technical engineering and production backgrounds should be encouraged to engage.

4. Encourage **diverse hiring practices** within the GM manufacturing sector, targeting under-represented groups. Promote the sector within these groups to remove barriers and increase opportunities.

5. Facilitate and enhance **peer-to-peer business networks** around skills delivery. Many networks exist but have been hampered by the pandemic.

6. Larger programmes like degrees and apprenticeships should be **broken up so that modules can be accessed separately**.

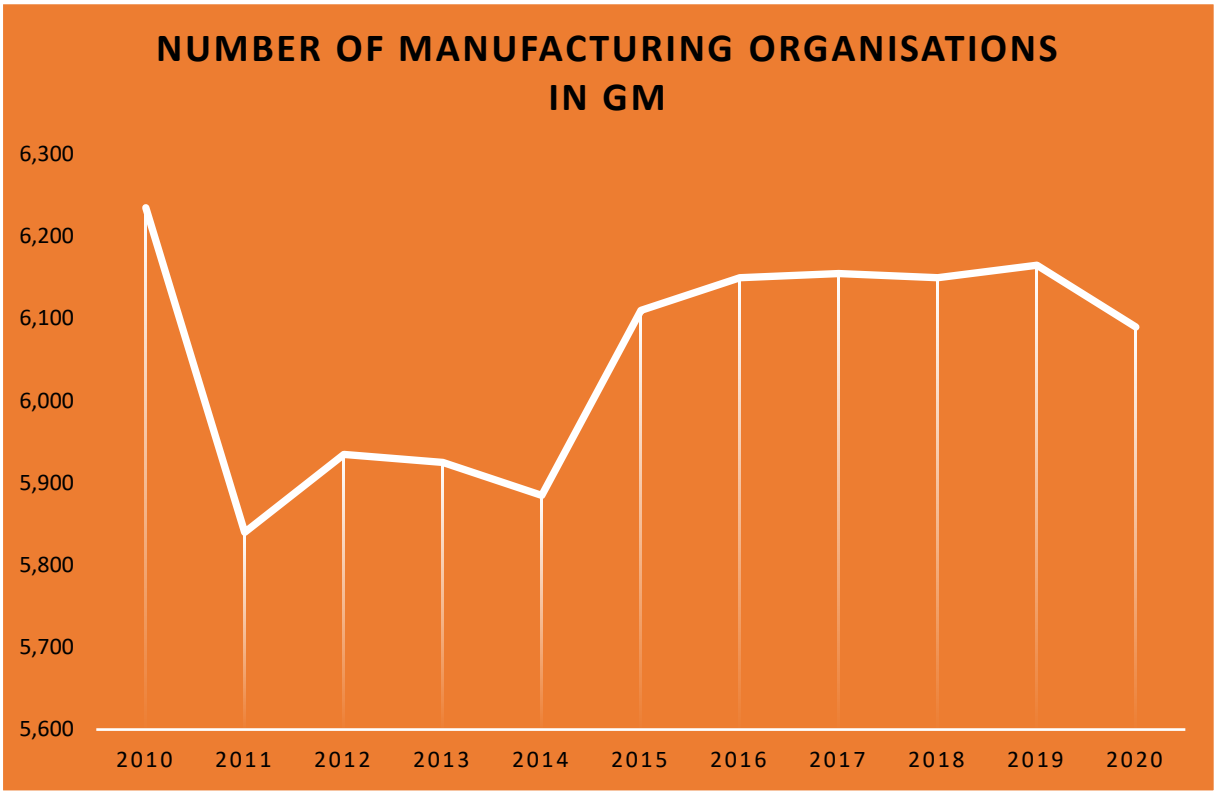
7. Support employers with the **transition to digitalisation and automation** – these developments are a great opportunity to turn some staff into subject matter experts within their business, improving job satisfaction and productivity.

8. Work to ensure that **T Levels are positioned as a leading option** with both further education colleges and employers. The relevant pathways for manufacturing will be launched in 2022 – work should be done to promote them for the SME market as well as larger employers well ahead of the launch.

(1) INTRODUCTION

(1.1) Manufacturing is an important sector for both the UK and Greater Manchester economy and has a long heritage in the region. With the advent of new technologies, production methods, and supply chain possibilities, the sector is rapidly transforming in some areas while other areas are falling behind. Part of the challenge for the sector on a nationwide basis is to improve productivity and compete on a global level. To enable this, UK national and devolved skills policy must support the sector in the most effective way possible.

(1.2) According to the latest Business Count data from NOMIS[1], Greater Manchester contains 6,090 Manufacturing businesses. The number has remained fairly stable over the past 10 years, only varying by 100-200 registered businesses away from the 6,058 mean. This stability indicates that the sector remains an important area of the GM economy both in terms of productivity and employment opportunities. As such, it is both a foundation and frontier sector for the region.



(1.3) According to the latest NOMIS data, the number of Manufacturing jobs within Greater Manchester is around 100,000[2], representing 7.4% of the total number of jobs. This has remained reasonably stable over the past 5 years, with a mean of 103,200 jobs. Other sources[3] with different definitions to the NOMIS data report approximately 116,000 jobs in manufacturing. Employing around 8-9% of the GM workforce makes it a key foundation sector for the GM economy.

[1] GMCA Analysis of NOMIS Data Extract – November 2020
[2] NOMIS Report – December 2020
[3] GMCA LMSR - 2019/20

Challenges and Opportunities

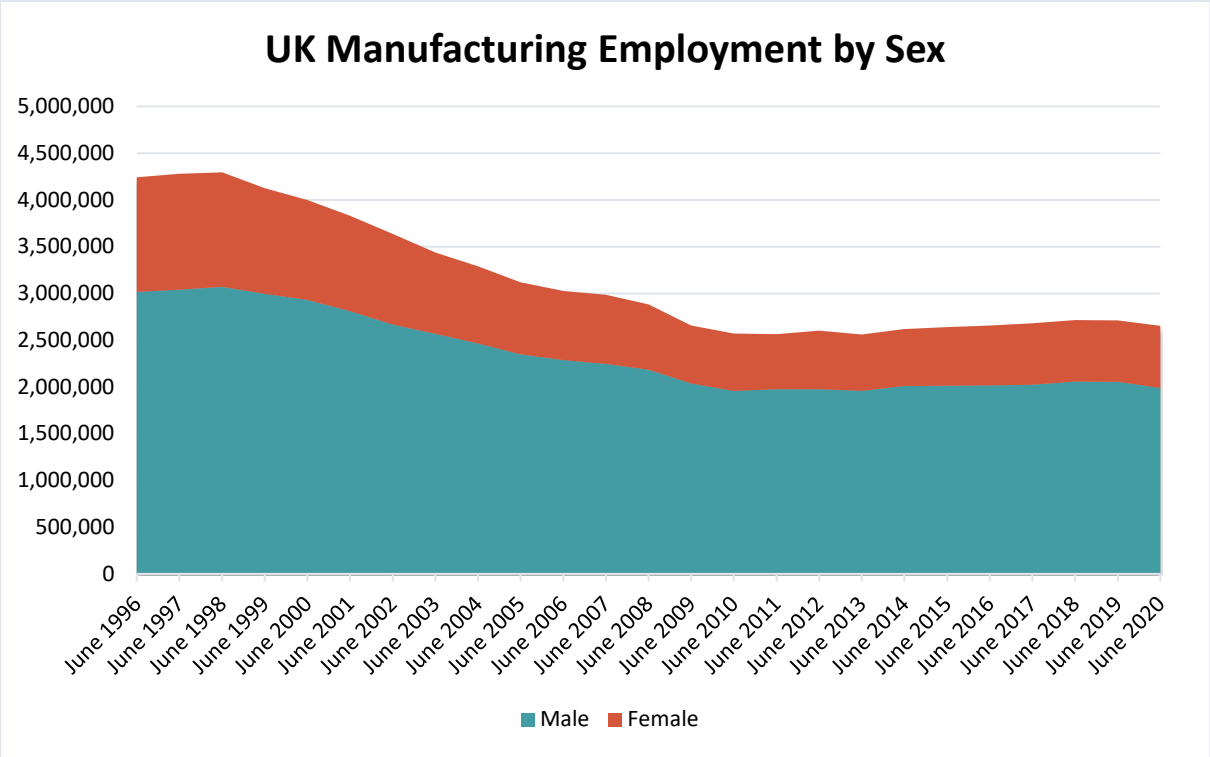
(1.4) The Manufacturing sector is facing various challenges on a global scale - these challenges are reflected at a local level within Greater Manchester.

- COVID-19 has had a mixed impact on the Manufacturing sector. On a positive note, sub-sectors which make essential products like milk, pasta, or toiletries, have been busier than ever as more of the population spend more time at home. GM has numerous food manufacturers in the region, many of which have seen little impact. Other sub-sectors with complex international supply chains or in sectors with reduced demand (i.e. automotive, aerospace) have seen decreased orders, high levels of furlough, and redundancies.
- Manufacturers in more advanced economies are increasingly under pressure from competing manufacturers in the developing world. This has accelerated a shift to more efficient automated systems, digitisation, and use of innovative new technologies (i.e. additive manufacturing processes, Internet of Things (IOT) and networked production).
- Trends towards electrification in the automotive sector are likely to cause significant disruption to the 2nd and 3rd tier supply chain as automakers shift to manufacturing electric and hybrid vehicles. There are no major automotive manufacturers in Greater Manchester, but there are a significant number of organisations supporting UK carmakers in the supply chain.
- Trends within Construction point to a much tighter partnership with Manufacturing. Modern methods of construction (MMC) will make more use of production techniques and well-integrated supply chains than at present. For example, instead of buildings being constructed on site, there is a drive towards pre-assembly of modules at the manufacturing stage, making the process easier, cheaper, and quicker.
- At a national level, Manufacturing has the joint highest Skills-Shortage Vacancy (SSV)[4] density (a vacancy which attracts applicants but none with the right skills) of 36% of all vacancies in 2019 (up from 29% in 2017). This means that employers in the sector are not able to reliably attract the skills they need to fill many positions.
- At a national level, Manufacturing has the joint lowest proportion of staff who received training in the past year at just 48%. This indicates that there is a lack of regular training and ongoing CPD/staff development.

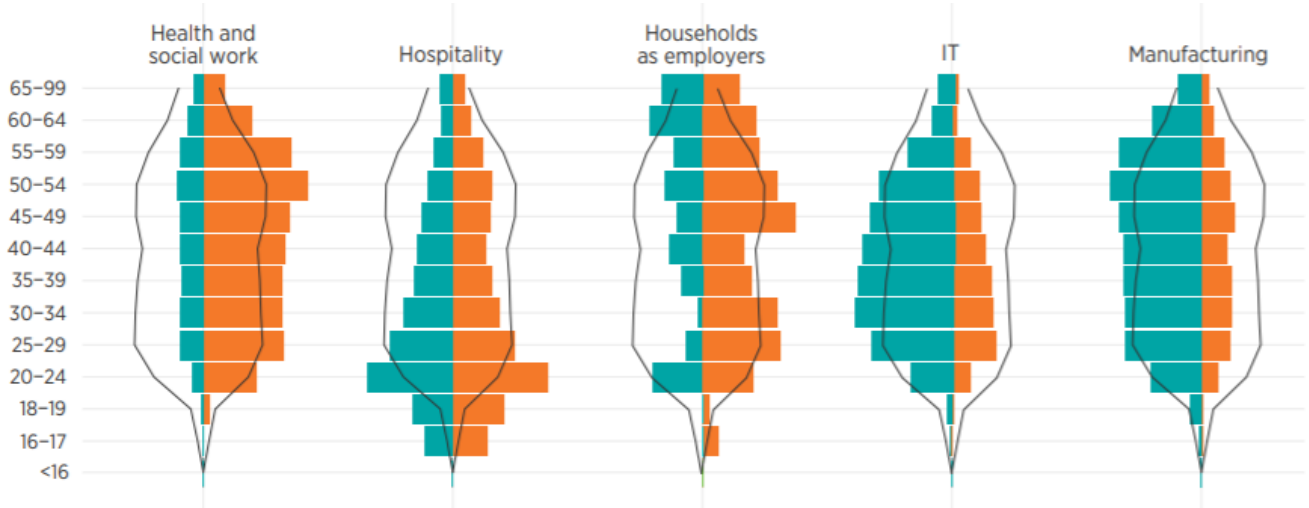
Industry Context

(1.5) As a sector, Manufacturing has a demographic tilt towards male workers occupying the majority of positions at all levels. Over the last 10 years in the UK[5], the average proportion of the workforce make up was 76.01% Male, 23.99% Female. This ratio is reflected within Greater Manchester and has remained fairly static over the past 10 years (as have the overall employment numbers).

[4] Employer Skills Survey – October 2020
[5] NOMIS Workforce jobs by industry (SIC 2007) and sex - unadjusted



(1.6) In addition to the skew towards male workers, the Manufacturing sector is one of the top sectors for employees aged 50+. It has a "top-heavy" demographic profile[6] as compared with other sectors such as IT or Hospitality. Some within the sector expect this to result in a worsening skills shortage at the more advanced levels as members of the older generations retire. The graphic below from the CIPD Report shows demographic profile of Manufacturing against other sectors – teal shows male workforce, orange shows female workforce.



[6] CIPD Report – Benefits of an Older Workforce – October 2019

(1.7) The ethnic background of the Manufacturing workforce is also skewed towards people from a white background. Data from NOMIS[7] shows that the Manufacturing workforce is 95.5% White (data shown here is for the North West as a whole, GM specific data is not available). All other BAME groups are underrepresented when compared to the whole workforce across the North West. It is unclear at this stage why this is the case – more work will be done to determine and address the cause of this discrepancy.

Ethnic Background	NW Workforce	NW Manufacturing Workforce	NW Differential	UK Differential
White	90.5%	95.5%	5.0	3.9
Mixed/multiple ethnic group	0.9%	0.7%	-0.2	-0.4
Indian	1.7%	0.6%	-1.1	0
Pakistani	2.5%	1.1%	-1.4	-0.4
Bangladeshi	0.6%	*	*	-0.4
Chinese	0.4%	*	*	-0.3
Any other Asian Background	0.6%	0.2%	-0.4	-0.5
Black/African/Caribbean/Black British	1.8%	0.9%	-0.9	-1.4
Other ethnic group	1.0%	1.0%	0.0	-0.3

*Proportion is negligible (<0.1%), so differential cannot be calculated

(1.8) As the NOMIS data above shows, using the same calculations at the UK level returns a difference in the BAME population within manufacturing. There is still an over-representation of the white population, but it is slightly less stark at the UK level. While work needs to be done at a national level to address the disparity, more work clearly needs to be done to diversify the workforce, with particular focus on the South-Asian population in the North West. Reassuringly however, the past 10 years have seen trends at both the nationwide and north west levels towards the diversification of the workforce, with increasing numbers of the BAME population choosing to work in the sector.

(1.9) Wider trends in Manufacturing point to an increasing use of automation, digitalisation, and new innovative manufacturing processes and techniques including 3D Printing. These areas are new to many Manufacturing organisations and will require a highly skilled workforce to implement them in the most effective way. This is often referred to as Industry 4.0 or the 4th Industrial Revolution (4IR).

(1.10) In a similar way, the increasing amount of data gathered by manufacturing processes by specialised and advanced sensors is leading to a more pressing need for data analytics in the sector. This skillset is not currently well-represented among the existing labour base. Good data analytics supports optimised production processes, data-driven decision making, and empowered continuous improvement teams. Given the uncertain global

[7] GMCA Analysis of NOMIS Data Extract – December 2020

landscape, development of new technology disrupting the industry, and the impact of the pandemic, many Manufacturers are in a situation where cost-cutting and efficiency gains are a priority. Larger organisations often have dedicated Operational Excellence or Continuous Improvement teams, but smaller firms often lack the scale to engage with these activities.

(1.11) Industry leading organisations are already starting to use advanced digital technology in their production, including AI predictive maintenance, machine learning, and modernised Enterprise Resource Planning (ERP) systems. Some employers say that this is leading to a widening technological gap between those manufacturers which are embracing these new systems and those which still run older more manual systems.

(1.12) The International Federation for Robotics issue statistics measuring automation in different countries. UK Manufacturing underachieves on this and does not currently feature in the top 20 countries when it comes to robotics density[8] (number of industrial robotic systems per employee). For the sector and for GM, this represents an opportunity to improve productivity and output. Two things need to be addressed to achieve this – the supply of automation equipment/machinery and the skills needed to maximise their use.

[8] IFR – 2020

(2) BACKGROUND

Policy landscape

(2.1) Manufacturing continues to play an important role in the UK-wide economy, making up nearly 70% of total Research and Development spend, 52% of exports, and 15% of total business investment. Exerting an outsized influence accounting for population, the UK Manufacturing sector compares favourably on the world stage as the 9th biggest contributor in terms of output (as of 2018[9]). More work needs to be done by both central and local governments to understand the needs of the sector and respond accordingly.

(2.2) According to recent NOMIS data[10] the largest sub-sector of manufacturing in Greater Manchester is Food and Drink (F&D) Manufacturing – comprising around 20% of the total jobs in the region. After this, component manufacturers make up around 13% of jobs – there are no other sub-sectors which make up more than 10% of the workforce. This makes the region fairly unique and varied, as compared with areas with large automotive, aerospace, or defence manufacturers (where a single company tends to employ a large proportion of the workforce). This diversity is a positive for GM, but it does make the skills challenge more complex – however, there are common themes which come out from all sub-sectors.

(2.3) Brexit has been an ongoing concern for many manufacturers – the uncertainty around the UK's future trading relationship with the EU up until the end of 2020 meant that many export-focused businesses are unable to plan long-term. Current systems used for Import/Export Declarations, Rules of Origin, and sensitive supply chains for intermediate manufacturing products now need to be adapted in line with the UK-EU agreement announced at the end of 2020. Turbulent currency markets have made it more difficult to manage exports. Due to this uncertainty around the future trading relationship and the stability of global supply chains, many organisations were reluctant to make large capital investments. Growth in business investment has slowed since Q1 2017, reflecting an increased appetite for larger cash reserves. Additionally, the end of 2020 saw huge uncertainty for the sector resulting in wasteful stockpiling of key intermediate products/materials for many companies.

(2.4) One possible opportunity on the horizon is that the combined pressures of Brexit and disruption of traditional supply chains due to COVID19 are causing many manufacturers to "onshore" some parts of their process or supply chain. After the shock of the lockdowns during the pandemic, some manufacturers felt that their supply chains were too exposed and vulnerable. Building a more robust UK-based supply chain then became a more desirable option (even if it

[9] World Economic Forum & Statista - 2018
[10] GMCA Analysis of NOMIS Data Extract – January 2021

increased cost initially). This vertical integration will increase the variety of production stages and processes taking place at individual sites – potentially increasing the variety of skills needed on those sites.

(2.5) At the beginning of the 2019 Parliament, the new Government told voters that "Levelling Up" would be top of the agenda. This was taken to mean a focus on drawing focus away from London and re-balancing the national economy – the UK is more regionally divided than any other advanced economy in productivity, income, unemployment, and health[11]. However, possibly as a result of the pandemic, the agenda has stalled. A year on, a survey of Manufacturers by MakeUK[12] found that over half (52%) had no real opinion of the activity relating to the levelling up agenda, due to vague definitions of activity, delays or lack of public communication about the activity to support the region. Of those who had an opinion, just 6% were positive, and 42% negative. "Levelling up" the regional economies of the UK remains a priority for central government.

(2.6) On a national basis, the Manufacturing sector is supported by centres of excellence operated through Innovate UK, an arm of UK Research and Innovation. These centres include the Manufacturing Technology Centre (MTC) in Coventry, the Advanced Manufacturing Research Centre in Sheffield, and the Centre for Process Innovation in Newcastle. GM has comparable centres, including the Henry Royce Institute, MMU's PrintCity, and the University of Salford's Maker Space. There is a big opportunity to link GM's Manufacturing base closer to these institutes for knowledge sharing and best practice.

(2.7) The Apprenticeship Levy was introduced in April 2017, requiring organisations with a payroll over £3m/year to contribute 0.5% of payroll costs over £3m into a digital account held by HMRC, which can then only be spent on apprenticeship training. While apprenticeships have long been a staple in Engineering/Manufacturing environments, many Manufacturers would like to see the levy reformed (95% as of MakeUK's report[13]). Fewer than 1 in 5 Manufacturers spend all of their levy allocation, and as a result, many payments are now fed back to central government instead of being spent on local skills development.

(2.8) With the phased introduction of T Levels starting in September 2020, Manufacturers will have more options when it comes to the training of staff in entry-level roles. However, T Levels specific to Manufacturers (specifically the *engineering, manufacturing, processing and control and maintenance* and *installation and repair for engineering and manufacturing* pathways) are not due to be released until September 2022. Understanding and exposure to T Levels within the sector is mixed but will likely improve ahead of the 2022 launch of relevant pathways as other sectors engage with them more. Employers are generally unaware of the changes being implemented on T

[11] IPPR – November 2019
[12] MakeUK – November 2020
[13] MakeUK Levy Report – July 2019

Levels - there is a real opportunity to build on this to make sure GM Manufacturers are at the forefront of this development.

Greater Manchester Manufacturing Ecosystem

(2.9) Greater Manchester sits in a unique position within the Manufacturing ecosystem, given its valuable heritage as an industrial centre, and a leader of the industrial revolution. While GM's importance as a manufacturing hub has decreased since then, it is still a proud part of the city's history, and is referenced in the Greater Manchester Strategy[14], citing "niche strengths in advanced materials; textiles; chemicals; and food & drink." GM is also home to 4 leading universities conducting research in areas of cutting-edge technology; businesses have a unique opportunity to tap into these knowledge sharing networks.

(2.10) The Engineering and Physical Sciences Research Council, an arm of UK Research and Innovation, funds research projects and academic innovation across the UK. It has a close relationship with the universities in Greater Manchester. Currently, the EPSRC have invested in doctoral education worth £82.3m in Greater Manchester - £76.8m at the University of Manchester and the remaining £5.5m at the University of Salford. Programmes funding under this are often industry focused research, covering a variety of areas like advanced materials, bioengineering, and textiles. Another initiative is the EPSRC Future Biomanufacturing Research Hub[15], which is run from the University of Manchester and leads on research in food, pharmaceutical and petrochemical manufacturing innovations. It was founded in 2019 with 30 partners from industry.

(2.11) In recent years, the development of Graphene in the city has led to the creation of the National Graphene Institute at the University of Manchester, which enables researchers and industry partners to develop and test new applications of the material. The Greater Manchester Local Industrial Strategy (GM LIS) also includes a commitment to establish GM as a centre of excellence for Graphene and Advanced Materials. This includes the creation of an industrial cluster called "Advanced Materials City" (in partnership with Rochdale and Bury councils) and the foundation of Greater Manchester Graphene, Advanced Materials and Manufacturing Alliance (GAMMA). This body aims to bring together researchers, industry bodies and businesses to enhance the development of the material in the region.

(2.12) A good example of collaboration between industry and academia, GM is also home to Print City, a centre for Additive Manufacturing at Manchester Metropolitan University. Hosting both students and industry advisors, Print City gives an opportunity for businesses to try out the new technology involved with 3D Printing production methods without the usually restrictive up-front costs as a barrier. Initiatives like this are crucial to the wider rollout of new technology and production methods.

[14] GM Local Industrial Strategy – June 2019
[15] EPSRC Future Manufacturing Hubs

(2.13) GM will be the home of a new technology centre, to be built in Rochdale by 2024/25, with work starting over the next year. The Advanced Machinery & Productivity Institute (AMPI) is intended as a catalyst for innovation in the region and has secured early funding from UK Research and Innovation. Local businesses are already involved in the process and are currently defining the structure and delivery model of the Institute. Once finished, it will be run in partnership with the National Physical Laboratory and Rochdale Development Agency as a driver of higher productivity and advanced engineering skills within the region. AMPI will also drive adoption of automation and robotics technologies, feeding into GM's ambitions around growing and enhancing the Advanced Manufacturing sector.

(2.14) One unique advantage for Manufacturers within Greater Manchester is the Business Growth Hub's Manufacturing team. Manufacturing Advisors from this team have contributed to the creation of 300 jobs within GM over the past 5 years, through assisting businesses with real world problems. Examples of their work include operational improvements, improving sales growth, and ensuring that GM organisations have access to new funding, innovations, and technologies they can apply in their production, all with the aim of improving productivity and enabling growth. This support is fully funded for organisations within GM.

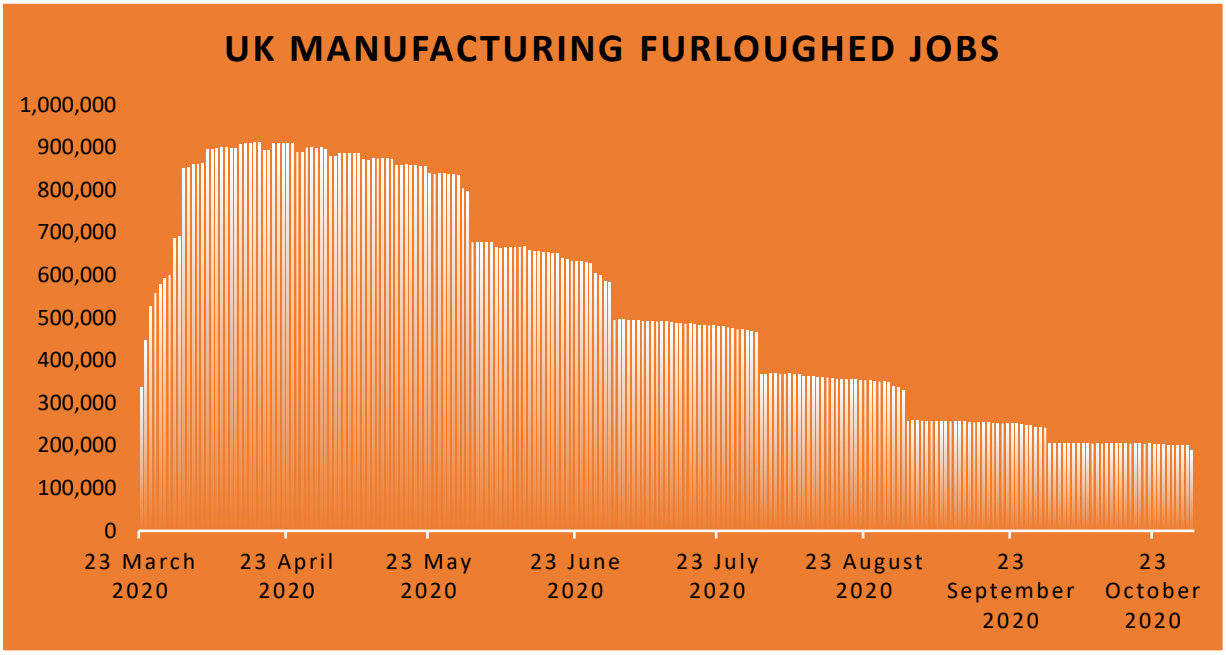
(2.15) Currently, SME Manufacturers in the North West can access grants from the Manufacturing Growth Fund[16] (sourced from the ERDF) which supports 36% of the cost of a growth-related project. Projects must be focused on growth but cover a wide range of possible topics including sales and marketing, e-commerce, and innovation. Demand for funding has exceeded supply, with many organisations requesting funds to make improvements to machinery and production environments.

(2.16) SME Manufacturers in the North West can also access the Made Smarter[17] initiative, which works on four areas – technological adoption, skills, innovation and leadership. The dedicated project team support SME organisations to accelerate the sector shift towards digitalisation and automation, with the ultimate aim of improving productivity. This ongoing initiative attempts to address the digitalisation gap between larger manufacturers and the SME community by supporting SMEs with the rollout of new industrial technology. Some of the challenges faced on this include both the lack of capital investment for expensive new machinery, and the lack of awareness or skills to use new technology.

[16] Manufacturing Growth Fund
[17] Made Smarter

(3) COVID-19: Impact on Manufacturing

(3.1) At the end of March 2020, the UK Government implemented the first lockdown to deal with the worsening COVID-19 pandemic. This lockdown, in addition to the new requirements for social distancing and shifts in consumer buying had a number of effects on the wider UK economy. As a sector, Manufacturing has seen a very mixed reaction. The Coronavirus Job Retention Scheme (CJRS) was widely used, seeing 41% of employers[18] in the sector placing staff on the programme. Overall furlough rates for the sector to the end of October 2020 (latest available data) are in the graph below:



(3.2) At the peak of the lockdown period in the UK, Manufacturing was the 3rd highest sector in terms of overall furlough numbers – only Retail and Hospitality were higher. Fortunately for Manufacturing, compared with these other sectors, most businesses were quick to bring staff back as the lockdown restrictions were lifted. Many businesses have since continued operating as before, often with new equipment, production floor layouts or H&S guidelines in place. Some employers reported that they had altered shift patterns to keep as many employees in the workplace as possible, reflecting a desire for staff to "keep up their skills" rather than let these skills decay during a furlough period.

[18] Gov.UK CJRS Statistics

(3.3) Employer reports reveal that market demand was the largest factor for most Manufacturing organisations as to whether they utilised the CJRS or paused production. Because of changing consumer habits in most areas, this saw some businesses thrive while others saw their incoming orders decrease significantly. Businesses forming part of the Automotive or Aerospace supply chains saw demand drop as car sales and air travel decreased. Organisations supporting harder-hit sectors such as retail and hospitality suffered as the knock-on effects from those sectors moved through the economy.

(3.4) Some organisations have thrived during the pandemic. In particular, many organisations which manufacture household essentials (food staples like milk/bread/pasta, toiletries) and cleaning products have seen their production lines running at higher capacity than ever before. This is again driven largely by shifts in consumer behaviour, including some stockpiling at the beginning of the lockdown period, the shift to home-working, eating in at home instead of dining out and a more hygiene-conscious public. Manufacturers who make products for home-based activities, like electronics for gaming, material and equipment for home improvements, arts/crafts, etc. all saw increased sales.

(3.5) On a positive note, parts of the sector were able to alter their production to meet demand for products like hand sanitiser, masks and medical PPE, all of which saw stockpiles depleted as the pandemic progress. For some businesses, this was a good option to fill their order books as their usual products were no longer in demand. Others did it out of a sense of public service, donating the required items to local NHS bodies.

(3.6) As with many parts of the economy, a drive towards cost-cutting and keeping cash on hand is driving redundancies within Manufacturers. Towards the end of 2020, this saw improvement, with fewer businesses expecting to make redundancies. In a report[19] released in October 2020, industry body MakeUK reported that “just under half (49.2%) of manufacturers have already made redundancies due to COVID-19”.

(3.7) An indirect side effect of the COVID-19 pandemic and subsequent measures to control it has been on the global financial markets. In March many global index funds, individual stocks and ETFs lost a significant portion of their value as investors sold off their holdings, expecting lower profits, job losses and business insolvencies. Indexes like the FTSE100, FTSE250 and German DAX lost 30 – 45% of their value over the space of weeks and countries worldwide went into lockdowns. While this decline will have affected many listed Manufacturing firms, it has also had a further indirect impact on the labour market within many sectors.

(3.8) With the decline in global stock prices, many people found that the value of their pension had decreased significantly. Depending on the risk profile of their pension, this has had an impact on their ability to retire from the workforce. While pension portfolios are usually diversified away from equities in the later stages of a career, the impact for some people approaching the

[19] MakeUK – October 2020

end of their working life has meant delaying their retirement. A report[20] released by Interactive Investor in October 2020 found that 12% of 18-54 year olds, 17% of 55-59 year olds and 21% of 60-65 year olds were planning to delay retirement due to their pensions being worth significantly less due to the downturn in markets.

(3.9) While this impact on retirement is negative itself, the effects may be felt further. Where retirement is delayed, positions (often senior) within businesses remain occupied and therefore slow down the promotion or recruitment of other staff into these positions. In a sector like Manufacturing where a large portion of the workforce is 50+, this may result in fewer opportunities for new and existing staff to start or develop in their careers.

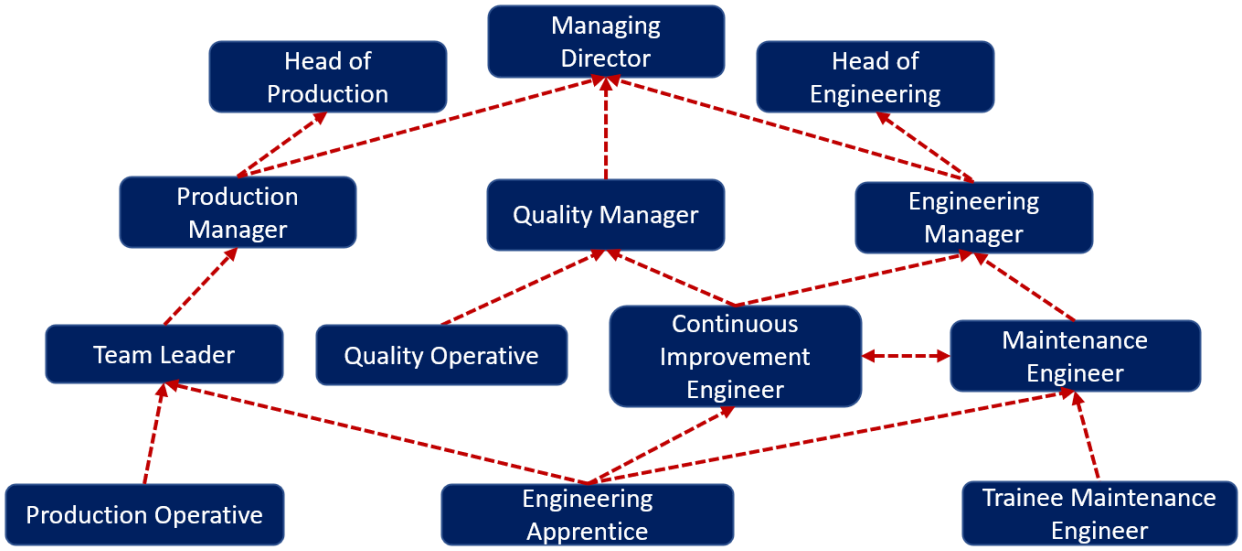
(3.10) One of the most widespread effects of the pandemic for many businesses has been a decrease in sales, with 54.8% of Engineering/Manufacturing businesses effected. According to the Growth Company's Situation Report and Business Survey[21], it is the most common reported negative effect for Manufacturing businesses within GM, followed by Minor Supply Chain Disruption (30.8% businesses) and Business Travel to Clients (23.1% businesses).

(3.11) Partly due to COVID19 and the new Brexit rules, some organisations are "reshoring" processes and suppliers – bringing supply chains back to the UK. Several industry bodies set up a matchmaking services called Reshoring UK[22], enabling manufacturers to find new local suppliers. This represents an opportunity to rebuild and strengthen supply chains.

[20] Interactive Investor – October 2020
[21] The Growth Company - COVID19 Situation Report and Business Survey (Results for two months up to 7th December 2020)
[22] Reshoring UK – January 2021

(4) MANUFACTURING LABOUR MARKET

(4.1) A basic occupational map for the core technical roles within Manufacturing is below. This has been assembled in collaboration with industry employers and shows simplified lines of progression seen in many Manufacturing organisations – small organisations may have just a few employees who will usually fit into this structure, but larger organisations will have various other departments feeding into the 3 areas. Generally speaking (excluding back office support roles), the roles can be split into Production, Quality, and Engineering, with the Production team being the largest in most organisations.



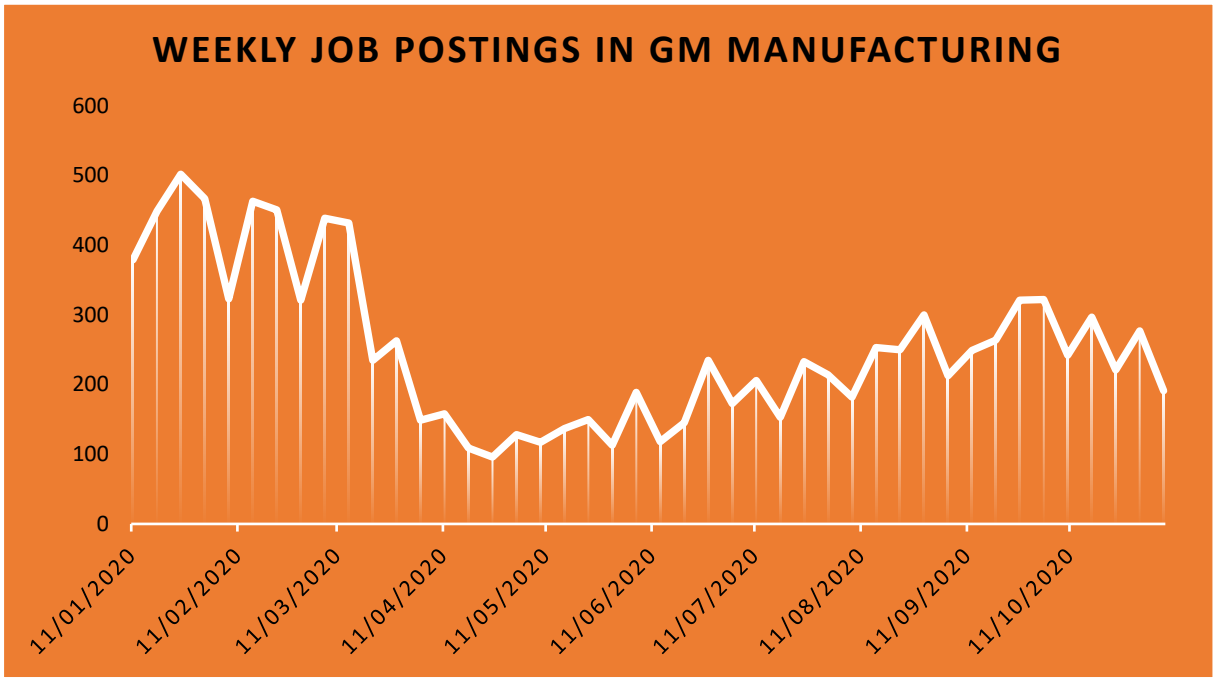
(4.2) Though this structure does not include any of the ancillary roles found in many Manufacturing organisations (i.e. warehousing, logistics, back office HR / Finance / Admin / Sales), it provides a clear idea of the most common entry routes into the sector and progression routes within it. These roles are mapped out further below with links to the apprenticeship occupational maps.

(4.3) Job titles within the sector tend to vary by sub-sector and by department. There are hundreds of variants in job role titles; some most common are found in the table below.

Production Roles	Technical Roles	Management Roles
Line Operative Assembler Electronic Assembler Fabricator	Electrician Electromechanical Technician Electronic Technician	Assembly Supervisor Chief Manufacturing Executive

Floor Assembler Packaging Engineer Painting and Coating Worker Precision Assembler Processing Worker Production Worker Operator CNC Machinist CNC Operator Food Technologist Machine Operator Machinist Manufacturing Technician Plant Operator Plastic Machine Worker Production Technician	Equipment Technician Field Service Technician Mechanical Technician Industrial Engineer Manufacturing Engineer Quality Engineer Continuous Improvement Engineer Quality Inspector Quality Assurance Manager Process Engineer Researcher New Product Development	Chief Quality Control Executive General Manager Maintenance Supervisor Production Manager Materials Planner Operations Manager Plant Manager Engineering Manager Product Manager Production Control Manager Production Planner/Scheduler Production Supervisor Safety Manager Safety Manager/Coordinator

(4.4) The number of job vacancies in Greater Manchester Manufacturing organisations has seen a significant decrease over the past year, nearly entirely due to the impact of the COVID-19 pandemic. Weekly vacancies dropped to just under 100 in the week commencing 19th April 2020 – just a quarter of the pre-lockdown averages. As lockdowns lifted and businesses re-opened, job postings increased towards the end of September before dipping again as case numbers started to rise again in October 2020. Further data on late 2020/early 2021 vacancy postings will be covered in future versions of this report.



(4.5) The share of Manufacturing vacancies in GM was 11.24% of the total vacancies advertised in w/c 9th February 2020. This has since decreased to 8.44% of the total advertised in w/c 1st November 2020. In comparison to other sectors, Manufacturing occupies the middle ground – hospitality, tourism, and retail have been slower to recover; education, healthcare and digital have recovered faster.

(4.6) The Manufacturing labour base will be affected by shifts in immigration policy - impact likely to be seen as a result of Brexit will be on the recruitment of skilled workers. Certain areas of Manufacturing are uniquely exposed to this – for example, 25% of staff in the Food Manufacturing sector (particularly strong in Wigan, Oldham and Rochdale) are EU-born workers[23]. As immigration from the EU decreases due to the impact of Brexit, these organisations may find it more difficult to recruit from their usual labour base. This could be a good opportunity for job-seekers as more vacancies become available – a shortage like this may also push employers to make the roles more attractive with higher salaries and improved working conditions. Additionally, if organisations can afford the initial capital cost, this represents a good opportunity for automation in the food manufacturing sector, creating higher-paid jobs as production roles are transformed into automation and robotics engineering roles.

[23] IPPR Post-Brexit Immigration – November 2020

(5) SKILLS DEMAND

(5.1) With the joint highest Skills Shortage Vacancy (SSV) rate (at 36% of all vacancies unfilled due to lack of skilled workers) and with the second highest rate of skills gaps (staff lacking full proficiency) of 5.8%, the skills challenge within Manufacturing is worse than most other industry sectors. With the sector identified in GM's Local Industrial Strategy[24] as a key industrial focus for Greater Manchester, a clear picture of the skills demand in GM is crucial.

(5.2) The range of skill levels required within GM's Manufacturing sector is wide. Although many individuals in the roles may be trained up to Level 3, many production roles are categorised as low-skilled, labour intensive jobs, where a new employee can be fully competent after a few days. This varies by sub-sector. Quality and Engineering roles tend to be semi-skilled or high-skilled roles taking much longer to reach competency. There is also a particular concentration of high-skilled roles in research, new product development, and quality testing roles. Production teams are rarely given further training once competent, unless an organisation is undergoing a programme of change or the implementation of new equipment/techniques.

(5.3) The skills that GM employers ask for are varied, but there are a few common themes across the three technical occupation groups. Below is a snapshot of required competencies and skills from currently advertised roles – these have been gathered from the advertised roles from employers based across Greater Manchester on a variety of platforms:

Manufacturing & Engineering Basic Competencies

Production	Engineering	Quality
• Work Ethic • Attention to detail • Hands-on approach • Communication skills • Procedural mindset • Team-worker • Organisational Skills • Tidy • Conscientious	• Numerate • Efficiency-minded • Problem Solving • Attention to detail • Communication Skills • Independent worker • Process Driven • Design understanding	• Attention to detail • Communication Skills • Scientific/Numerate Background • Organisational Skills • Accuracy and Precision • Quality Tools • Persuasive/Personable • Concise

[24] GM Local Industrial Strategy – June 2019

Diagnosing Skills Gaps

(5.4) Employers told us that several things need to be taken into consideration when it comes to assessing skills requirements and advocating solutions. In terms of the general needs, there are a few key themes to pick out.

- *Entry-level Roles* – Apprenticeships are still the preferred route for many engineering roles. Engineering apprenticeships are long-term programmes (often 3-4 years) however, this is understood and accepted across the sector. There aren't as many relevant programmes for production roles.
- *Management Training* – Staff are often promoted to management roles simply by virtue of experience in the production/engineering team. These staff go from being "one of the team" to holding management responsibility and often don't get any formal training in people management skills.
- *Digital Skills* – A combination of rapidly developing technology and an ageing workforce results in a digital skills gap. While large organisations are shifting towards Industry 4.0, most SMEs are being left behind.
- *Specialist Skills* – A wide variety of low volume, but very specific technical skills are needed in some businesses, particularly in advanced manufacturing and research roles. Often this talent has to be sourced from overseas.
- *Sales and Marketing* – Many organisations at all levels within the sector have a poor understanding of sales and marketing principles. While this is not unique to the sector, it presents a large opportunity with Manufacturing
- *Delivery Structures* – Manufacturing has a relatively rigid shift structure in comparison to other sectors. The preferred method of training is short-term (1-3 months) and focused (covering a specific topic or area of study). It also varies depending on the size of employer – some staff are resistant to classroom provision.
- *Recruiting the right graduates* – SMEs are regularly left out of graduate recruitment circles, with these high-achievers choosing to work for global market-leaders instead.

(5.5) The Manufacturing sector within Greater Manchester is fairly unique as a sector in terms of how well skills translate between sectors. Generally, the skills of one engineer (for example in food manufacturing), will be similar in terms of the skills of another engineer (for example, in electronics manufacturing). What is more difficult to quantify is how much of their experience would be transferrable – because a food production process will be different to an electronics production process, experience in one area doesn't necessarily carry across. This differs to sectors like retail, finance or legal where experience is comparable between organisations. In most cases, this results in a long-serving workforce within individual businesses and within sub-sectors. This may have an impact on repurposing talent from one sector to another – for example, someone moving from a food production environment into an electronics production environment may not be able to use much of their previously gained experience.

(5.6) Data supporting retention within Manufacturing is mixed. According to the ONS 2017/18 release[25], the sector has a slightly above average employee turnover rate (27% vs 28% of workers moving companies year on year). However, XpertHR's survey[26] in the same year cite a retention rate for engineers at 4.9% (by far the lowest of staff surveyed). Given that the latter survey doesn't include other staff, this gap is explained by higher turnover rates among staff in production focused roles. There is very little data to determine differences in company size, but anecdotally, larger firms have a higher rate of turnover than SMEs – especially when SMEs have fewer than 10 staff. These small engineering/manufacturing businesses are often family run and serve a very niche market – staff in these businesses tend to be long-serving. One GM employer suggested that progression was only available by stepping into "dead man's shoes", i.e. because of such high retention, progression opportunities only become available when staff retire from the business.

(5.7) Part of this difference between production and technical roles is explained by the structure, entry requirements and job satisfaction of the different teams. In engineering, a long-serving workforce is both beneficial and detrimental for the sector. It is beneficial in that individuals have job security, companies have a high level of loyalty, and the sector benefits from stability. However, it can be seen as detrimental in that the labour market lacks fluidity, companies end up with fewer new ideas (or "fresh eyes"), and the sector develops a reputation for a high entry barrier, fewer progression options, and an ageing workforce.

Entry Level Roles – Non-Apprenticeships

(5.8) Most employers reported that generally there are a suitable number of applicants for entry-level roles across both production and engineering teams. This may change over the coming year as the UK completes its exit from the European Union and it becomes more difficult for EU nationals to work in the UK. EU nationals currently make up a large proportion of employees in the sector, particularly in production roles on the factory floor. A 2019 ONS report[27] shows that 10.6% of the UK Manufacturing workforce were EU Nationals – the highest of any sector. In the North West, this number is 7.3% – the third highest sector.

(5.9) If migration from the EU to the UK continues on the downward trend seen since 2016, it will become increasingly difficult for Manufacturers to hire into production roles. Work must be done at all levels of government to stop recruitment and skills challenges from escalating. Various industry bodies are lobbying the government for special treatment for the sector on the grounds of this unique exposure. Employers can play their part by ensuring that there are good quality jobs, where progression pathways are clear. Work can and should be done at a local level as well to build interest in Manufacturing roles both within our School/FE population and among unemployed people.

[25] ONS – October 2019
[26] XpertHR – October 2017
[27] ONS – July 2019

(5.10) The number of roles occupied by EU nationals varies by subsector. One of these particularly vulnerable is the Food and Drink (F&D) Manufacturing industry, a sector which has a particular concentration in Wigan, Oldham, and Rochdale. While the data on the workforce is only available at national levels, the proportion of the UK F&D Manufacturing sector made up of EU Nationals is 25% of the workforce[28]. Given that F&D Manufacturing makes up nearly half of GM's Manufacturing workforce, this will be a crucial area of focus during the first few years of divergence from the EU.

(5.11) There are some organisations leading work to generate this sort of interest in the sector. MakeUK and the MadeIn group are both sector bodies and advocates of employing more local residents into roles within Manufacturing. All levels of government should be working alongside the sector bodies to do this, perhaps building on the growing realisation that global supply chains are vulnerable to shocks as seen during the pandemic. With local manufacturing capability growing in both actual and perceived importance, the sector should capitalise on these trends to attract workers to entry level roles.

Management Training

(5.12) As identified above, management training is a particular area of need for many businesses in Greater Manchester's Manufacturing sector. Employers recognise the need for talented Engineering and Production managers but prefer to promote their skilled staff into these roles, keeping technical knowledge within the business. There are organisations who do recruit managers from outside, but these managers often then take a significant amount of time to acclimate to the new production environment. Because every subsector (i.e. aerospace, food, component) is different in terms of production methods, experience doesn't translate as well as skillset.

(5.13) Employers reported that promoting from within is common in the sector, and particularly prevalent within family-owned SME manufacturers. Leadership positions are sometimes assigned based not on skillset, but on time-served within the business, or even seniority within the family. This is positive in one sense, as these managers will have an in-depth knowledge of the business, familiarity with the staff, and above average commitment. However, there is a regular challenge that these managers face – they have made the move from being "one of the team" to being responsible for the team. This is often difficult for manager and staff to accept, especially where there are no pre-established HR (performance, absence, dispute) processes in place. Several employers we spoke to told us that the sector sees high levels of absenteeism and grievances due to poor management understanding of HR processes – usually because of a lack of training in these areas.

(5.14) Training provision in leadership and management to fill this need is plentiful, but few programmes are geared towards the sector – the programmes that are specific to the sector are costly (particularly for SMEs). There are unique challenges which come with the sector, but much of the material in the area is

[28] IPPR Post-Brexit Immigration – November 2020

wide-ranging and generic. Programmes suited for precisely this demographic would perhaps include elements of people management, communication in a production environment, lean methodologies, and cultural considerations. Improving the skillset of these first-level team leaders and line managers would likely lead to decreased absence, higher motivation, and increased productivity.

Case Study – Apprentice Recruitment and Management Training

Nexperia are a manufacturer of semi-conductors, whose GM site is based in Stockport – they are currently undergoing rapid growth. As a market-leader of semiconductor manufacturing, the increase in the electric vehicle, mobile phone and wearable technology markets, all of which require complex and larger numbers of chips, is fueling Nexperia's growth.

With a growing order book, the HR and L&D leads at Nexperia identified a need for new talent, tapping into apprenticeships to help develop the workforce. In 2017, the company started an Academy partly as a response to the introduction of the apprenticeship levy and partly to secure a future supply of talent for the organisation. Recruiting over 100 apprentices across 2018 and 2019, they have set up partnerships with training providers which deliver training to the apprentices on-site, allowing close monitoring of progress. For new recruits, the favoured apprenticeship pathways are the Performing Manufacturing Operations L2 Framework and the Improvement Technician L3 Standard.

In addition to creating a solution to their future skills and workforce requirements, Nexperia have also put a lot of work into expanding the skillset of their managers and production team leaders to include people-focused skills. Ramping up training options for their existing workforce, they offer a customised Management (ILM) qualification for staff moving up their technical career ladder. The training was scheduled with options pre- and post-shift work, to increase attendance on the programme without disrupting the teams. This content was designed specifically to improve absence rates and staff retention. With content on Mental Health Awareness, introductory people leadership skills and management communication styles, it has had a significant impact on the leadership styles within the business, reducing absence rates and improving staff satisfaction. Managers within the business are now able to better balance the needs of production with the needs of their individual staff members, improving both output and the culture within the teams.

Digital Skills

(5.15) Exposure to digitalisation varies hugely within the Manufacturing sector. There are some companies, usually market leaders and global companies, who run fully automated production processes, are guided and scheduled by AI and machine learning, and are making use of new technology like additive manufacturing. On the other hand, there are other companies who have not yet even computerised their production, still use manual hand tools, and machinery which has not been updated in decades. Making the leap from the

latter to the former presents many barriers – mainly lack of capital. Skills is another barrier, so work needs to be done to remove this.

(5.16) Many SMEs have been insulated from the industry trend towards digitalisation as there is a general attitude that current methods aren't broken and don't need fixing. Some even take it as far as being proud of traditional production methods as sustaining heritage skills and techniques. With the shift in overall technology still taking place, with growth in consumer wearables and smart tech, renewable energy, and electrification leading the way, these trends will touch all areas of Manufacturing. With increasing shifts in demand (i.e. for intermediate products like components) and increasing pressure to decarbonise, manufacturers will be pushed to update their production methods and machinery.

(5.17) New machines and production techniques are in many cases vastly different to existing methods – this comes with a new challenge for manufacturers to implement these in the most effective way. For example, most modern machines now contain a great number of sensors to monitor different variables relating to both the product and the machine itself. Machines like this generate vast amounts of data which can be used for process optimisation, preventative maintenance, and continuous improvement. Data analytics (understanding, interpreting, and using this data) will therefore be an important skill for many engineers and production staff to have.

(5.18) One of the first steps in ensuring this takes place will be to raise awareness of the possibilities involved with Industry 4.0 level technology. While Computer-Aided Design (CAD) and Manufacturing (CAM) have long been used in many organisations, the development of these areas in recent years has merged with trends in industrial digitalisation. Specialists in areas like additive manufacturing, data analytics, and AI are currently rare within the sector, and particularly within the SME market. Many SME organisations may not urgently feel the need for these skills for the next few years but will need to engage in these areas as industry-leaders using them increase market pressures.

Case Study – Digital and Specialist Skills

Along with awareness and skills, one of the biggest barriers to the development of advanced manufacturing processes and digitalisation is the up-front capital cost of the new equipment. Especially for smaller organisations, it's not worth purchasing a machine unless it's guaranteed to become a crucial and value-adding part of a production process. A recent programme run as part of the Made Smarter pilot has addressed one area of the use of new digital technology within Manufacturing. By allowing access to and guidance on Additive Manufacturing equipment and techniques at MMU's PrintCity, the programme aims to allow businesses a forum in which to experiment with new processes and to share understanding about the development of products using these methods.

In partnership with Manchester Metropolitan University's PrintCity and a lead SME Employer, Fabricon Design Ltd, the programme targeted businesses in Greater Manchester and Lancashire as part of the Fast Track Digital Workforce Fund pilot in early 2020. As one of the only programmes on this pilot to focus specifically on the need for digital specialist skills within Manufacturing, the outputs and learnings are important to build on. Participants in the programme come from SMEs across the two regions and bring real world examples of design issues or projects from their businesses to be looked at during the programme. Participants are upskilling and taking these skills into more digitally involved roles within their businesses to enable the benefits of Additive Manufacturing to be realised.

The PrintCity facility holds dozens of cutting edge 3d printers alongside a bank of equipment to help with the digital design, planning and production to introduce participants to the steps needed to set up a process like this. With the curriculum designed to show the full end-to-end workflow for Additive Manufacturing, many participants are becoming the digitalisation "champion" within their organisations. Small scale, focused programmes like this are a great way to encourage specialist digital manufacturing skills to flourish.

Specialist Skills

(5.19) For advanced roles, especially within sectors manufacturing complex products like electronics or aircraft, it is often necessary to recruit from overseas. Employers reported that certain vacancies are unfillable from the UK's workforce. Roles dealing with specific new and advanced materials are difficult to fill even when companies are happy to look wider than the UK. With the University of Manchester leading the way in terms of applications of Graphene, there are opportunities to link researchers to industry to help more organisations develop specialist skills in these advanced materials applications.

(5.20) Welders are a crucial part of many fabrication processes and are often in short supply – it's a difficult role in challenging physical conditions. Across many sub-sectors, good welders are hard to find and hard to keep – there is a lot of competition to recruit staff with welding skills, which has resulted in a steady inflation of salaries. While in the long-term, robotic welding systems

will likely be able to meet this demand, at least for simple tasks, advanced skills are needed for complex work. Welders are needed to build the automated robotic systems that will perform these tasks – this dissonance is perhaps contributing to the lack of new entrants in the labour market. Meeting this medium-term demand is a difficult, specific need – upskilling existing metalworkers and production staff is important, along with attracting new talent to the sector as a whole.

(5.21) In cases like this where specialist skills are very difficult to find, there is opportunity to improve and nurture the relationship between industry and academia. There are several initiatives which operate at this intersection and see success with linking up academic researchers with organisations and production sites. The Made Smarter initiative has been running a programme to improve digital and specialist skills in partnership with Manchester Metropolitan University's PrintCity.

Sales and Marketing

(5.22) The pandemic has exposed a number of things over the past 9 months – one glaring challenge for many in the Manufacturing sector are sparse order books. Any manufacturer exposed to the automotive, aerospace, hospitality or retail industry has seen a decrease in sales. With much of the sectors B2B transactions being done on a relationship and network basis, the number of potential new orders has decreased dramatically as these relationships and networks have been damaged by lockdowns, meeting restrictions, and workplace closures. As a result, the hunt for new sources of income has become ever more important.

(5.23) There are many SMEs within the sector which serve a singular purpose – making one specialist product for one customer. This is inherently risky but has been a stable business model for decades in some cases, especially where the subsector is relatively stable and undisrupted (i.e. food manufacturing, machinery components). For some SMEs, this hasn't been a problem until now; many exist as "lifestyle businesses", where a steady stream of income for the owner is enough and the business has no growth aspirations. Wide-ranging disruption means that organisations are now having to "sell" where they have never needed to before.

(5.24) Organisations across GM would be helped by a true understanding of the *value* of what they create – the focus within the sector tends to be on functionality. This shift in thinking is a valuable skillset which is often overlooked within manufacturing SMEs. For example, many don't have any marketing literature, brochures, or website listings – they sustain the order book purely on the back of existing customers and organic word-of-mouth growth. Modern techniques like local SEO, conversion rate optimisation, and micro-targeting are very rarely employed by these smaller organisations. Encouraging this difference in thinking will broaden the horizons of these organisations and expand their customer base.

Delivery Structures

(5.25) Within Manufacturing, there is a large variety of preferred training delivery structures – this tends to vary with employer size and employee role. Within smaller organisations where many employees are not university graduates and started through traditional apprenticeship routes, there is strong preference for "hands-on" practical training and a dislike of classroom training. Some in traditional manufacturing organisations are even "anti-academic" and don't see classroom delivery as useful for learning new skills.

(5.26) Similar to the networks through which many manufacturing SMEs secure new orders, there is a big focus in the sector in peer-to-peer recommendations. Managing directors trust other managing directors more than most other sources – relationships like this are where the bulk of B2B transactions are agreed and where supplier/buyer recommendations are made. Learning and training delivery can't come solely from a top-down source like local or central government – it needs to have advocates embedded in these business-focused networks. While the networks have been hampered by restrictions on face-to-face meetings and events, there is an opportunity to bring skills to the forefront when the pandemic is over.

(5.27) As the pandemic has shifted learning techniques online, some manufacturers have accepted this and engaged with online training. However, there is understandably still a deep-seated preference for practical on-site training, particularly when learning about specific equipment or production processes. Face-to-face teaching has declined because of social distancing measures – as a result many in the sector are holding off on training until it returns.

(5.28) Employers would prefer for courses, degrees, apprenticeships and diplomas to be broken down into blocks. Many elements aren't relevant, so it would be good to be able to pick and choose which modules. This is particularly the case when choosing courses for existing staff who already have a wide skillset. Providers should be encouraged to be more flexible with delivery methods so that employers can access precisely the training they need. Training provider Enginuity have developed a popular system[29] which serves this, using digital training methods and online resources.

[29] Enginuity Engage Platform - 2020

Case Study – Delivery Structures and Online Resources

Enginuity is an Engineering and Manufacturing Charity whose purpose is to support their sector. They work with partners, connecting employers to support and encourage the development of vital skills. Their recently launched Engage platform collates resources from various publishers, institutions, and sector experts providing them for free online. It features learning from organisations like the Open University, edX, and the AMRC alongside others including Enginuity's own content.

With a wide range of different formats, level of detail, and topics, Engage contains articles and videos that are consumable within minutes alongside full several-day interactive courses. This kind of flexible learning is a big part of what employers ask for in how they want to use training. The variety of topics covered is wide – covering (among others) sustainability, digital manufacturing methods, and new thinking in management strategies. When registering on the system, learners state which areas they are interested in before being shown relevant recommendations. Because of the way courses are broken down, learners can find and quickly engage with specific content.

During the pandemic when face-to-face learning has not been possible, Engage has seen increased use across all Manufacturing sectors. With free access to thousands of hours of content, use of the platform should be widely encouraged across the sector. Additionally, learning providers should be encouraged to add further content onto the platform, to increase the variety of topics available to study.

Recruiting the right graduates

(5.29) There is an increasing expectation among graduates of quick progression within the organisations they join. This is partly driven by the global market leaders' schemes becoming more "fast-track" to stand out. Global companies such as GlaxoSmithKline and JaguarLandRover don't generally struggle for graduate recruitment and in most instances can take their pick of hundreds of applicants. Moving further down the supply chain, graduate recruitment gets more difficult – many GM SMEs report struggling to find the right skills at this level.

(5.30) Part of this challenge comes from the increasing quality of the graduate schemes at the larger organisations, who now assign more resource to the selection, development, and progression of their graduates than they have in the past. Graduates are often engaged well before they leave university and sometimes visit the production sites in advance of assessment centres. This dedicated engagement and "taster session" culture works well for the larger organisations, but often sets expectations high for other graduate programmes.

(5.31) A type of network effect has formed around careers fairs held by universities – the bigger, more recognisable companies attend careers fairs because the

universities want them there so that the fairs are well attended by students. This in turn then increases the attractiveness of the event for large employers. The companies then benefit from this by being the first to engage with the high-achieving graduates. As a result, many SMEs are not invited to attend these careers fairs. Even where they are invited to attend, many aren't in a position to spare the staff to engage – this puts them at a further disadvantage to large organisations which have dedicated graduate engagement teams as part of the recruitment function.

(5.32) At the SME level, the appetite for graduates is strong particularly in engineering roles. However, they often cannot compete with larger firms in terms of the variety of the role, wrap-around support and modern production facilities. As a result, many graduates take up positions with SMEs as a back-up choice after being unsuccessful for a position with larger organisations. If they then expect the same level of support, development and progression opportunities as they would receive at a larger organisation, they will be discouraged and less committed when they do not receive it. As it would be difficult and unfair to rein in the arms race competition for graduates at the higher levels, SMEs need support to develop better and more attractive graduate schemes to retain talent in the region. In addition, Universities should be encouraged to reserve space on Careers Fairs for local SMEs, regardless of their size, or number of vacancies.

(6) SKILLS PROVISION

(6.1) Generally speaking, the provision of training for the manufacturing sector is good. There is a long cultural history of learning roles in a practical and "hands-on" way, often supplemented by classroom theory teaching. However, after staff have become proficient at their job roles, there is often little training on offer for them – this is particularly the case within SMEs where training budgets are limited or absent. Ongoing CPD is present, but often due to changing health and safety standards, certifications, or new equipment. Training by original equipment manufacturers (OEMs), machinery, and tool manufacturers is common, but only relevant for the competencies relating to that piece of equipment.

(6.2) Providers of training include a wide range of institutions, universities, colleges, private companies, and individual consultancies. Many larger manufacturers develop their own programmes for new starters – graduate and apprenticeship schemes are both popular for bigger firms as a way of introducing new staff to production environments.

(6.3) In comparison with other areas, the workforce of Greater Manchester contains a good number of skilled and semi-skilled workers for companies to employ. While unable to compete with the West Midlands on Automotive production skills, or with Cambridge on R&D skills for example, GM scores reasonably well across most manufacturing skills areas. Developing better and more productive staff starts with our local residents and with the quality of school and Further Education (FE) provision.

Schools and FE

(6.4) As a sector, Manufacturing employs a wide range of people from many different educational backgrounds. In production teams, many of the roles are simple, manual, and can be performed with very little prior training. Engineering teams tend to require a technical background. Quality and R&D roles often have a heavy focus on measurement and experiment. As a result, employees with good results in Science, Technology, Engineering and Maths (STEM) subjects are very desirable for most Manufacturers.

(6.5) In 2019, GMCA partnered with a number of education stakeholders to launch the GM STEM Framework[30], an initiative to increase exposure of schools and residents to the use of STEM skills, knowledge and qualifications. Improving the understanding of the variety of STEM career pathways is one of the main objectives. Often awareness of the possibilities is enough to drive young people or their influencers to pursue a career in a STEM field. One important area is STEM inspiration activities (i.e. school engagement with engineering, visits to museums, STEM role models). However, the quality of this varies. More needs to be done to make sure that the *right kind* of inspiration activity is taking place.

[30] GMCA - 2019

(6.6) While recent years have seen the increasing importance of the internet in careers decisions, parents are still a huge influencing factor in the pursuit of technical careers like Manufacturing/Engineering roles. Perceptions in parents of what these environments are like do not reflect the reality in most cases. Usually only where a family member has worked in a role like this will a young person get a positive influence from the sector. Manufacturing is still seen as a lesser career choice to the traditional professional careers (lawyer, accountant, doctor, etc.) despite the qualification levels required, progression options and salary expectations being similar, at least for Engineers. Employers would like more to be done to reach parents and boost the standing of the sector as a worthwhile career option, in addition to more online content relating to manufacturing careers for young people.

(6.7) The Science Museum Group (operators of Manchester's Museum of Science and Industry), run a STEM Ambassador programme across the North of the UK, engaging individuals from STEM careers to encourage school and FE-level learners to consider certain careers. Ambassadors from the Manufacturing sector account for 6% of the GM ambassador population, and 10% of the total contact hours[31] – this is low considering Manufacturing should be a good source of STEM careers. The split by local authority area is below – while this data is not perfect (measuring where STEM Ambassadors live vs. manufacturing workplaces), it does provide a good picture of which areas are over- and under-represented:

LA	% total GM Population	% STEM Ambassadors	% total GM Manufacturing Employment	Differential
Bolton	10%	15%	14%	1%
Bury	7%	5%	7%	-2%
Manchester	19%	17%	11%	6%
Oldham	8%	8%	10%	-2%
Rochdale	8%	1%	10%	-9%
Salford	9%	7%	7%	0%
Stockport	10%	16%	10%	6%
Tameside	8%	4%	10%	-6%
Trafford	8%	13%	9%	4%
Wigan	12%	14%	12%	2%

(6.8) There are various initiatives aiming to connect schools with industry as a way of providing real-life careers information to young people. GMCA's Bridge GM is one of the dedicated teams which aim to bring schools and employers together through the recruitment and support of expert Enterprise Advisors – these are industry-experienced individuals who work closely with school leadership to design and implement effective careers engagement. There are currently 149 Enterprise Advisors supporting schools across GM. Of these, 15 are from Manufacturing backgrounds. This is at odds with anecdotal evidence

[31] STEM Ambassador programme – December 2020

which suggests that school and FE leavers don't know enough about what Manufacturing environments are really like as a career option. It's possible that the volunteers from the sector are not from technical roles, so aren't getting a full picture of the pathways available.

(6.9) Many of Greater Manchester's local college network deliver pathways linked to the Manufacturing Sector. Primarily, this takes the form of L2/L3 Engineering courses, often linked to Traineeship or Apprenticeship programmes. Employers generally see these courses as high quality and appreciate the content – there is a base level of understanding required for many engineering roles (in particular around Health and Safety) much of which is covered. However, attendance on these programmes represents just 3.2% of the overall FE population[32].

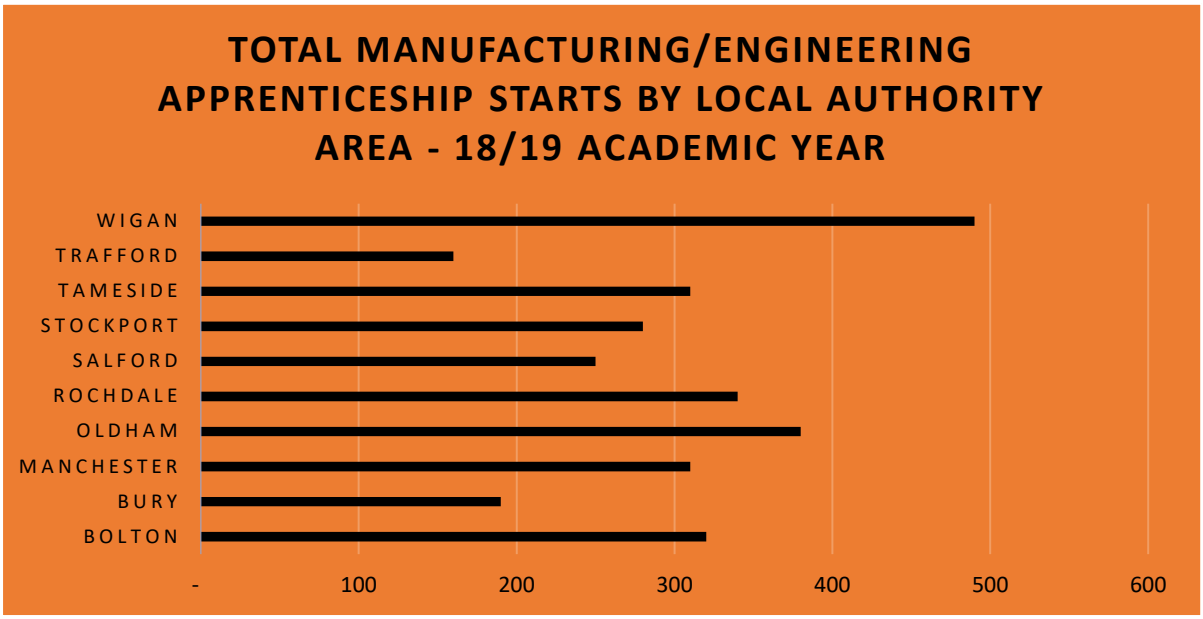
(6.10) With the introduction of T Levels in September 2020, Greater Manchester currently has two providers leading the way on delivery, with a further 8 still preparing to deliver in 2021. The intention from central Government is to allow employers to really become actively involved in the design and delivery of T Level content whilst also providing the opportunity for realistic and meaningful placements of up to 45 days for suitable learners. These placements become the talent pipeline for employers to shape and nurture their future workforce. However, as mentioned above at (2.5), the pathways which are most relevant for Manufacturing will not be available until 2022.

Apprenticeships

(6.11) Apprenticeships have long been favoured by Manufacturing organisations – this is a cultural staple of the sector and in part because of the nature of the work and industry. Many organisations will have senior leadership who joined the business through an apprenticeship. The nature of work requires understanding of specific machines, production techniques, standard operating procedures, and H&S standards, all of which will differ in each manufacturing organisation (as compared with Accountancy/Legal practices, Health and Social Care environments, for example). This is a large reason for the culture of apprenticeships within Manufacturing – it is usually better to train someone up on the job than expect someone to be fully competent straight off the back of a degree or training programmes.

(6.12) The number of apprenticeship starts across GM on Manufacturing/Engineering pathways has dropped since 2016, largely due to disruption from the introduction of the Apprenticeship Levy and the shift to the new Standards. Starts fell from 3,594 in 2016/17 to 3,066 in 2017/18 and further to 3,011 in 2018/19. However, starts across all sectors fell - this decrease represents a smaller proportional fall than in sectors like Business, Administration and Law, and Retail and Commercial Enterprise. The split of apprenticeships across the 10 boroughs of GM is below – the split general follows both population and the number of registered manufacturing businesses, with the largest concentrations in Wigan and Oldham:

[32] GMCA LMSR - 2019/20



(6.13) While many Manufacturing organisations are familiar with the new Apprenticeship Standards, the take up of them has been relatively slow. Many companies still source their apprenticeship candidates from local colleges or independent training providers (ITPs), many of which still deliver Apprenticeship Frameworks in this sector. One of the most popular entry-level programmes is the Performing Manufacturing Operations L2 NVQ. The delay in this shift is perhaps down to the extra requirements added as part of Apprenticeship Standards – in particular the End Point Assessment, which adds several months and additional work to the last portion of an apprenticeship programme.

(6.14) The 20% off-the-job requirement for all apprenticeships has made it more difficult for mid-career staff to take up apprenticeships, especially when they are in KPI-focused, shift work production roles. Instead, staff will be offered the opportunity to develop either internally through inhouse programmes, or externally with commercial training providers who run short courses. Because of the traditional culture of apprentices being junior within Manufacturing/Engineering roles, the shift in mindset around the availability and quality of apprenticeships is still taking place across the sector.

(6.15) There is a reasonably high barrier to entry to delivering apprenticeships for engineering/manufacturing professions. Many local colleges deliver the entry-level programmes, but because of the high capital cost of tooling, machinery and safety equipment, there are very few providers who consistently deliver the high level programmes. For entry level roles, organisations have an understanding that their apprentice will spend significant periods of time out of the workplace with their training provider (in some instances 80% of their time) to learn the basic required skills. Greater Manchester has a number of well-regarded apprenticeship providers across different Local Authority areas – these include SETA, STEGTA, Trafford College and Tameside College.

(6.16) Below is a collection of the Apprenticeship Standards developed to support the Manufacturing and Engineering sector. This is list is not exhaustive and focuses on the core technical occupations as set out in the occupational map above. Not all of these pathways may have GM-based providers. Levels refer to the National Qualification Framework equivalent (running from 1 – 8). Sector specific apprenticeships are broken down.

Manufacturing & Engineering Apprenticeship Pathways

Entry Level (L2 - L3)	Intermediate (L4 - L5)	Advanced (L6+)
Production Operative Trainee Maintenance Engineer Engineering Apprentice	Team Leader Continuous Improvement Engineer Maintenance Engineer	Production Manager Engineering Manager Quality Manager
Production/Fabrication • General Welder L2 • Materials Cutter L2 • Metal Castings, Foundry and Patternmaking Technician L3 • Metal Fabricator L3 • Pipe Welder L3 • Plate Welder L3 **Food and Drink** • F&D Process Operator L2 • F&D Advanced Process Operator L3 • Advanced Baker L3 **Assembly** • Furniture Manufacturer L2 • Wood Product Manufacturing Operative L2 • Print Operative L2 • Print Technician L3	**Production/Fabrication** • Propulsion Technician (L4) **Food and Drink** • Brewer L4 • F&D Engineer L5 • Advanced Dairy Technologist L5 **Assembly** • Road Transport Engineering Manager L4 • Space Engineering Technician L4 **Textiles** • Textile Technical Specialist L4 • Fashion and Textiles Product Technologist L4 **Engineering** • Process Leader L4	**Production/Fabrication** • Manufacturing Manager (degree) L6 • Materials Process Engineer L7 **Food and Drink** • F&D Advanced Engineer (degree) L6 **Assembly** • Aerospace Engineer (degree) L6 • Space Systems Engineer (degree) L7 **Engineering** • Manufacturing Engineer (degree) L6 • Electrical or Electronic Technical Support Engineer (degree) L6 • Control Technical Support Engineer (degree) L6

Textiles • Sewing Machinist L2 • Textile Manufacturing Operative L2 • Footwear Manufacturer L2 • Fashion & Textiles Pattern Cutter L3 **Engineering** • Engineering Operative L2 • Engineering Technician L3 • Maintenance and Operations Engineering Technician L3 • Improvement Technician L3	• Improvement Practitioner L4 • Improvement Specialist L5	• Process Automation Engineer L7 • Systems Engineer (Masters) L7 • Improvement Leader L6

Higher Education

(6.17) Greater Manchester has 5 universities in the region (University of Manchester, Manchester Metropolitan, University of Salford, University of Bolton, and University Academy 92), serving over 100,000 students[33]. Around 36,000 students graduate every year and join the labour market, 46% of which stay within Greater Manchester.

(6.18) Of the 101,935 university students studying in Greater Manchester in the academic year 2018/19, 8,430 were studying programmes related to Engineering and Technology. This has decreased year on year since 2015/16, when the total was 9,440 (a 12% decrease over the period). The reasons for this decline are unclear – during the same period, there have been increases in the number of students studying degrees related to Medicine (13,825 to 14,590 – a 5.5% increase), Biological Sciences (9,075 to 9,715 – a 7% increase) and Computer Science (3,725 to 4,385 – a 17.7% increase)[34].

(6.19) More concerning is the fact that this decline in Engineering and Technology degrees is not mirrored at a national level. Overall numbers of students in the UK studying these programmes has increased slightly from 163,150 in 2015/16 to 165,180 in 2018/19. However, the share of students studying these degrees within Greater Manchester remains higher than at a national level – (9% in 2015/16 and 8% in 2018/19, compared with a static 7% UK-wide). The broader implication is that while GM attracted a large proportion of UK Engineering students in 2015/16, they are now studying elsewhere.

[33] MIDAS
[34] GMCA LMSR - 2019/20

(6.20) This shift away from Engineering related degrees is perhaps explained by the rise of digital careers. With the decline in UK manufacturing over the past 20 years and the boom in digital career pathways in areas like software development and cybersecurity, these sectors are perhaps attracting a larger share of the high-achieving candidates from schools/FE institutions. These digital pathways also provide a clear path to success for ambitious young people – the rise of tech billionaires is well documented and names like Bill Gates, Mark Zuckerberg and Jeff Bezos have become household names. GM has been trying to improve its reputation for being a digital city over the past decade or so – the number of degree starts suggest that this is working.

(6.21) One other factor possibly feeding into this is the public perception of the Engineering/Manufacturing sector and its role in careers decisions. Over the past 20 years there has been a series of negative news trends concerning the UK Manufacturing sector – slipping down the global rankings for output (fueled largely by the rise of China/India/South Korea)[35], the offshoring of production sites and more recently, the complication of supply chains due to the Brexit negotiations. This negativity has likely contributed to the decreased interest, combined with the outdated perceptions of the sector and misunderstanding of the reality of most manufacturing environments (particularly with parents/carers, teachers, and careers advisors).

(6.22) In 2019 the UK Manufacturing industry employed just under 1,500 graduates on formal graduate schemes, the 7th largest sector to do so (down from 4th highest in 2019)[36]. The overall number of filled vacancies on graduate schemes in the sector was down 24.3% on 2019s total, largely due to the impact of COVID19 on the economy. Graduate wages in the sector are in the top half of sectors, however, the sector is coming under increasing competition from digital and financial services organisations in the battle for high-achieving STEM graduates.

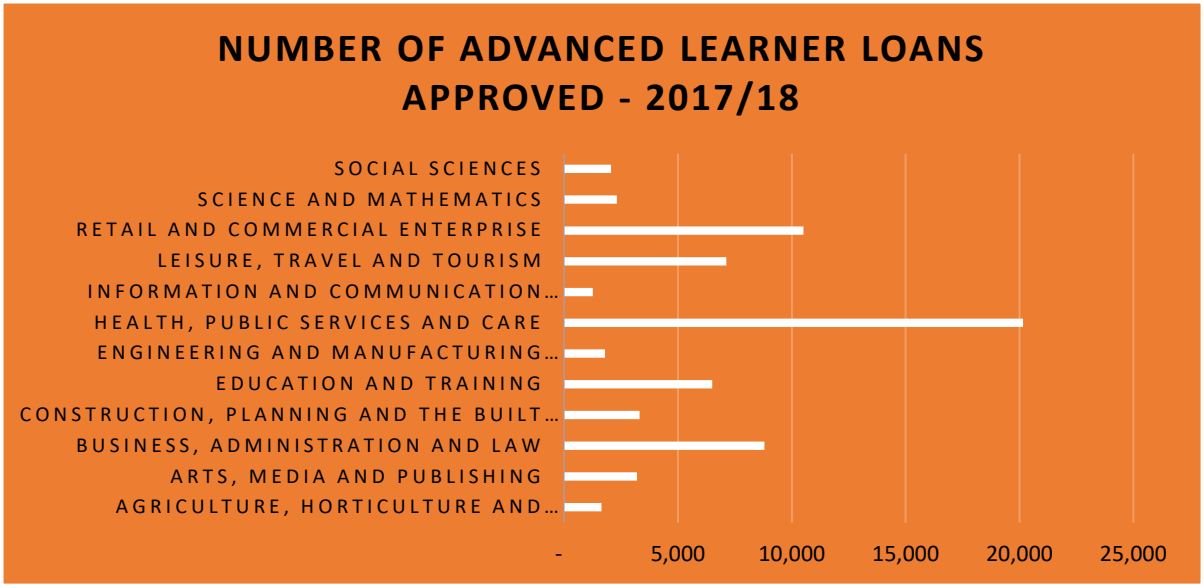
Adult Education

(6.23) Government plans for a rollout of the £2.5bn National Skills Fund have been delayed somewhat due to the impact of the COVID19 pandemic. Still not much is known about how the funding will be spent – it was announced in September 2020 that part of the funding would contribute towards a "lifetime skills guarantee", allowing adults to study a level 3 qualification funded by the government. Manufacturing will need to be at the forefront of any ongoing consultation on the funding to ensure that suitable qualifications are an option under this. GMCA should work with the sector and the sector bodies to support this.

(6.24) Since 2013, the government have funded learning loans in different forms – any adult can access funding for tuition fees on hundreds of different approved Levels 3 – 6 qualifications. There are numerous courses approved for access under Advanced Learner Loans which serve the Engineering and Manufacturing sector (Sector Subject Areas 4.1 and 4.2). However, the

[35] Brookings Global Manufacturing Scorecard - 2018
[36] HighFliers Graduate Scheme Report - 2020

number of loans approved on these pathways represents just 2.5% of the total approved.



(6.25) There are various reasons why the engagement with these loans has been lower in the sector, but most of these are positive. One reason is that other funding exists for many of the desirable qualifications in the Manufacturing sector – the L3 FE pathways, apprenticeships and degrees are all well-funded via different mechanisms. Another reason is that many (particularly large) employers have dedicated training budgets and commission bespoke training for their staff. However, there is a lack of awareness around what's available among SME organisations and their staff. A greater understanding of these qualification funding methods would likely benefit SMEs more than the larger organisations.

(6.26) Over the past 12 months, GMCA has been running a pilot skills programme called Fast Track Digital Workforce[37], funded by the Department for Digital, Culture, Media and Sport in partnership with Lancashire Digital Skills Partnership. The programme funds a number of different short-term (12-week) projects to meet targeted skills needs and upskill/reskill residents. A number of these programmes have related to digital skills within Manufacturing – including data analytics, additive manufacturing, and cloud-based services.

Commercial Provision

(6.27) There are several areas of skills provision within the Manufacturing/Engineering sector which are filled mainly by commercial private-sector provision. These tend to be higher-level programmes for existing staff who need expertise in a specific area. The structure of these programmes vary but are driven by employer requirements, often taking the form of short-term, intensive "boot-camp" style training. There are several well-regarded specialist providers in Greater Manchester fulfilling this requirement, including The Manufacturing Institute and IN4.0 Group.

[37] GMCA - 2020

(6.28) One major area of commercial training is in mid-level Management training. There is a particular issue within many Manufacturing/Engineering environments around management skills. While careers within the sector produce highly skilled people with process-focused, problem solving and technical mindsets, these skills don't necessarily translate well to a people-focused management role. Employers are largely aware of this issue and some have taken steps to commission bespoke management programmes, designed a programme in-house with their L&D function, or access the Apprenticeship Levy funded Team Leader / Supervisor (L3) or Operations Manager (L5) Standard.

(6.29) Most manufacturing environments are entirely set up to a single purpose – get a physical product assembled in the shortest, most efficient way possible. Specialists in this area are called Continuous Improvement professionals who adhere to "Lean" methodology. Large organisations will often have entire teams whose sole purpose is to reduce waste, streamline and standardise processes, and solve persistent problems. SME organisations however, often rely on existing production/engineering staff to perform these duties. There are specific, short commercial training programmes to cover this, in addition to the improvement apprenticeship pathway (L3, L4, L5, L6 Standards).

(6.30) While manufacturing environments have always made heavy use of data with metrics like production run rates and efficiency scoring, a growing requirement for many Manufacturers is data analysis, as machines contain more sensors, become more capable and output more process data. This requirement is currently served by the "Six Sigma" tools and techniques (named after terminology from the statistical modelling used to improve processes). The skills included in Six Sigma are highly technical and numerate – the aim is to teach specialists to use data and observation to make business decisions, all with the end-goal of continuous improvement in mind. Courses to study it are colloquially broken down into Yellow, Green and Black Belt certifications, which get progressively more difficult and time intensive. Some larger organisations employ specialists, usually at Black Belt level, to support engineering and production improvement projects. While there are multiple training providers and independent consultants in Greater Manchester who serve this need, some organisations will need more advanced data science skills in the near future.

(7) SUMMARY AND NEXT STEPS

(7.1) This section aims to collate the learning and recommendations from the intelligence gathering process, giving key recommendations for sector employers, training providers, and sector stakeholders. A further detailed action plan featuring both commissioned and non-commissioned work will be produced early 2021.

(7.2) Recommendations made in this report will not all be progressed or lead to future work from GMCA. Their aim is to support stakeholders across employers, business networks and membership organisations, skills providers, schools, and sector bodies, with a deep and detailed understanding of the current state of the skills challenge for Manufacturing. Some recommendations will address existing challenges, while others will work towards future talent/skills development.

Manufacturing – Deciding on a career

Challenges

(7.3) The main challenges for individuals and employers at the early stage of the talent pipeline are crucial to get right. The main issues facing the sector at this level are:

- Among many young people, the reputation of the sector is poor, particularly for production roles. This in terms of the expected conditions of work and limited progression/future opportunities.
- Negative stereotypes, particularly concerning the existing make-up of the workforce – largely middle-aged and male.
- The future state of the UK manufacturing sector is frequently cast in doubt owing to trends of offshoring and supply chain disruption from COVID19 and Brexit.
- Within school/college populations (as well as the parents/carers of these young people), there is a lack of understanding of what modern manufacturing environments are truly like – some perceptions are remarkably old-fashioned.
- SME organisations have many valuable roles to offer to GM's engineering graduates but are often second-choice options for them.
- Types of roles are poorly understood aside from engineering and production – roles like quality, scheduling, R&D, etc. are rarely discussed or popularised as part of careers inspiration activity.

Recommendations

(7.4) On the basis of findings from this report, GMCA would make the following recommendations to support individuals, employers, training providers, and educational institutions:

- GMCA's Bridge GM team act to link up schools' careers functions with Enterprise Advisors from various sectors – currently 10% of their EAs are from Manufacturing backgrounds, more should be encouraged to engage with the programme (in addition to the Science Museum's STEM Ambassador programme).
- Schools and Colleges have various industry links (usually on a local basis). However, this is patchy both at a national level and across the regions of Greater Manchester. Employer links to schools and FE institutions should be encouraged and nurtured both at large employer and at SME level.
- Building on these employer-education links – companies should allow and encourage visits from young people, teachers, and parents/carers. Visibility and understanding of manufacturing environments would help to change perceptions.
- More work should be done both at a national and local level to celebrate the successes of UK Manufacturing, through organisations like MakeUK and the MadeIn group.
- During school/college engagement, careers advisors should ensure they are providing the *right kind* of inspiration activity – using the right role models, case studies, and companies to inspire STEM careers.
- More and better links should be made between services for young people. A great deal of work goes on in the public, private, and charitable sectors – links between these organisations would benefit all the existing initiatives and their participants.

Manufacturing – Accessing effective training

Challenges

(7.5) Provision of manufacturing related degree and apprenticeship programmes is generally suitable – this is a very common route into the sector for new starters. Content and quality of delivery on these programmes is generally good. There are some challenges at this level:

- The number of apprenticeships on relevant pathways in GM has decreased over the past 4 years, but this is largely in line with decreases in other sectors. Given the importance of apprenticeships for Manufacturing, this is concerning.

- Graduate numbers on Engineering/Manufacturing degrees in GM have decreased over the past 4 years. The share of overall numbers in the UK has remained the same, which implies students are studying elsewhere.
- Understanding of employment and occupation pathways among these new entrants is poor – progression routes are not clear.
- Larger employers tend to recruit a bigger proportion of the high-achieving apprentices and graduates.
- Training programmes for new and existing staff are not kept in one place – there are dozens of different types of provision from different providers.

Recommendations

(7.6) For individuals seeking training, whether young people enrolling onto FE, apprenticeships, or degree courses or for existing workforce, we would make the following recommendations:

- Engineering courses should be positioned as a viable alternative to other traditional (law, medicine, finance) programmes.
- SMEs should be encouraged to engage closely with schools/FE/universities careers staff so that they are included in careers fairs, and so that staff are better equipped to have informed conversations.
- Platforms like Enginuity's "Engage" should be supported by training providers (adding more diverse and good quality content) and used by employers (to access a collection of training materials).
- Progression routes, potential future careers, and occupation pathways should be made clearer and linked to formal qualifications – a good understanding of this will improve both early-career engagement and mid-career progression planning.
- Training for existing staff should be altered to align with employer and employee needs – shorter-term programmes in a modular format. Ideally some larger programmes like degrees and apprenticeships should be broken up so that modules can be accessed separately.

Manufacturing – Seeking employment

Challenges

(7.7) The labour market within manufacturing is generally positive – retention is particularly high among engineering positions. There are several important challenges which must be addressed – these are not just unique to GM, but reflective of the UK-wide sector as well:

- Even with the confirmation of a Free-Trade arrangement with the EU, Brexit will cause disproportionate disruption to the sector due to the importance of manufacturing to the export market. It will be most acute in those sub-sectors where import/export practices are well embedded and where the workforce is composed of EU nationals.
- Manufacturers struggle to recruit the right skills they need in some cases. A lot of this is due to specific machine, process, or material skills required – with the joint highest number of skills shortage vacancies (second only to construction), nearly 2 in 5 vacancies go unfilled.
- At higher levels, recruitment practices lean heavily on machine skills, engineering, or production experience over attitude and work ethic – employers are perhaps missing out on some good future talent due to this.
- The sector still attracts mainly male and mainly white applicants to most positions, particularly engineering and production roles. This results in fewer overall applications for most jobs.
- More roles will go unfilled as the ageing workforce approaches retirement. Young people joining take a long time to become as skilled as these retirees. However, it will create progression positions for younger staff.
- Many businesses in the sector, especially at SME level, are run as "lifestyle" businesses, with no real growth aspirations or expansion plans – as a result, these organisations rarely recruit new staff.

Recommendations

(7.8) To improve the labour market conditions for both employees and employers within Greater Manchester, GMCA would make the following recommendations:

- Build on the increased perceived importance of manufacturing as a key foundational sector for the UK and GM economy to attract more candidates to jobs.
- Encourage diverse hiring practices within the GM manufacturing sector, targeting under-represented groups. Promote the sector within these groups to remove barriers and increase opportunities.
- Align GMCA's work with the manufacturing sector to UK bodies like MakeUK. Intelligence and information from GM should feed into the national conversation on skills, along with the promotion of the sector.
- Food manufacturing will need additional support after the UK completes its exit from the EU – job roles in the sector should be given particular attention in future work.
- Support local business networks, particularly SME focused groups, to work together and reduce risk by sharing best practice and training schemes.

Manufacturing – Retention

Challenges

(7.9) Once staff are in position, the issue of retention and further progression becomes more important. Retention varies a lot across Engineering/Production roles. The challenges the sector faces include:

- Low engagement in training (excluding OEM training) and ongoing CPD from many employers – more common in SME organisations.
- Poor management structures, practices, and role definition, largely as a result of promotion practices and little training – more common in SME organisations.
- Production roles generally poor quality (varies by sub-sector and company) – often feature repetitive tasks with little scope for creativity. Very little training or development is given to staff in these roles, resulting in poor retention.
- Many generic management development programmes exist, but few consider the specific challenges of manufacturing environments.
- Training that is delivered often must be tailored to be more bespoke to a particular manufacturing environment.
- The past two decades of UK manufacturing slipping behind emerging countries and more recently the COVID19 pandemic and Brexit challenges have all impacted the perception of the sector. It is no longer seen as a sector for secure employment.

Recommendations

(7.10) Keeping GM residents in productive and fulfilling work is a core mission for the GMCA – for the manufacturing sector, we would recommend the following:

- Employers should work to improve the quality of production roles through increased variety, opportunity to contribute to problem-solving, and progression routes.
- Industry bodies and employers should attempt to clarify the levels and type of qualification required to progress within certain fields.
- Encourage the sector to share best practice and knowledge – this does happen already, but at a reduced level due to COVID.
- Support employers with the transition to digitalisation – developments are a great opportunity to turn some staff into subject matter experts within their business, improving job satisfaction and productivity.

(8) NEXT REPORT

(8.1) Intelligence gathering will be an ongoing activity for GMCA and partner stakeholders. The data and intelligence gathered as part of this report will be enhanced and added to as the sector, policy landscape, and economic situation develops. A further revised version of this report is planned for release in 2021.

(8.2) Areas which require deeper research and intelligence gathering include:

- **Sub-Sector Differences** – Manufacturing has a wide and varied base of sub-sectors, most of which are represented in Greater Manchester. What sort of differences in skills supply, provision, and requirement are there between these?
- **In-work Progression** – In many cases, there are no formal triggers for promotion or progression. A future report would look at this in detail to build a picture of what is important for employers when choosing their future leaders.
- **Digital Transformation** – Digitalisation will disrupt the sector slowly, but the sector must be ready to react when the time comes. Robotics and automation may displace labour in a variety of roles – re-skilling these workers will be important to ensure high employment rates.
- **Brexit Impact** – Further medium- and long-term analysis of the impact of Brexit on the manufacturing labour market, and what sort of opportunities or concerns there might be for the sector.
- **Advanced Materials** – A particularly strong area of expertise in Greater Manchester, owing to various academic research projects, the development of graphene, and niche market-leaders in GM.
- **New Policy Decisions** – With the introduction of the National Skills Fund in early 2021, along with the ramp-up in T Levels in September 2021, the face of skills provision for engineering/manufacturing will change significantly. What changes this will cause are unknown.

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