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together



**A FRAMEWORK FOR ALIGNING EDUCATION
AND JOBS IN GREATER BIRMINGHAM**

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INTRODUCTION

Today, more than ever, the prosperity and competitiveness of cities and regions depends on their human capital. Those regions that are able to educate, train, attract, and retain individuals that meet the needs of the community's employers will prosper, while those that don't will quickly fall behind. In recent years, "talent" has solidified its place at the top of employers' priority lists as they look to locate and expand their businesses. A region's workforce is its most powerful economic development asset.

As the importance of human capital has increased, so has the rate of change throughout the labor market. Technological change and a globalized world mean that the right set of skills today for a given job will look very different than the right set of skills a few years from now for that same job. The responsibility over this dynamic – one that simultaneously holds the power to disrupt and the power to accelerate economic prosperity – does not fall squarely on a particular party's shoulders. All players in the labor market – business leaders, educators, workforce intermediaries, and workers themselves – bear collective responsibility for whether or not a region's workforce holds a region back or propels it forward.

The people of the greater Birmingham region face a choice of how best to steward their most powerful economic development asset. In the years since the Great Recession there have been exciting developments throughout the region that have planted the seeds of future growth and shared prosperity. The completed Railroad Park in downtown Birmingham stands as a powerful metaphor of what could be: unity and rebirth from the foundation of the Magic City's industrial past. The Innovation Depot buzzes with ambitious startups and world class computer processing capability. The region's influential industries have begun to partner with Career and Technical Education programs, community colleges, and local universities in innovative ways around credentialing and training.

Despite all the positive momentum, the region hasn't yet channeled its collective energy into a single, unifying agenda that serves the interests of all of its citizens. A nimble and well-trained workforce that fully meets the needs of all current and future businesses in the seven-county region could be the focus of such an agenda. Such a focus isn't just a business prerogative, it's a social priority as well. The prosperity of Birmingham's families and communities are inextricably tied to the health of the region's employers (and vice versa).

Accepting collective ownership of moving the region's labor market to a state of alignment will require change from every participant in the system. Employers will have to better communicate what it means to be successful on the job to workers and the institutions that train them. Educators will have to more fully embrace the challenge of understanding which ways the winds are blowing in the labor market their students will face. Cross-sector leaders of all stripes will need to ensure that adequate resources and energy are being allocated against the region's workforce goals. Achieving this talent roadmap is well within Birmingham's reach.

Let's start building it together.

ACKNOWLEDGEMENTS

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LEAD PARTNERS

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EXECUTIVE SUMMARY

The Greater Birmingham seven-county region* (Birmingham) has a rich history as the industrial engine in the South. This industrial base produced significant growth and prosperity through much of the 20th century. While that entrepreneurial spirit still exists within the community, the past few decades have been defined more by an emphasis on existing local industrial base rather than expanding Greater Birmingham's economy into new, dynamic, high-growth sectors. This has led to less robust employment and economic growth than peer cities, or the nation as a whole (Charts 1 and 2). Birmingham's Real GDP has increased by 8% since 2010, compared to a 13% national average, and much faster economic growth in Atlanta (19%),

CHART 1:
Regional GDP Growth 2010-16

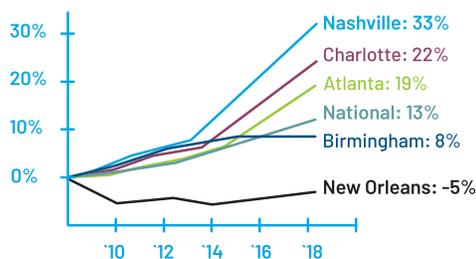
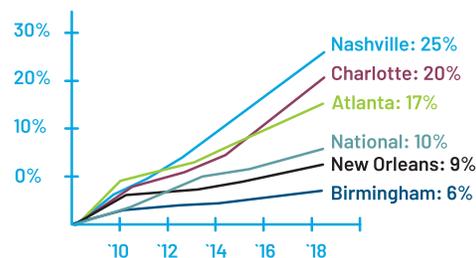


CHART 2:
Regional Employment Growth 2010-16



Charlotte (22%), and Nashville (33%, see Chart 1).¹ Similarly, looking at employment, Birmingham lags the nation and peer cities, having increased only 6% since 2010, compared to 10% nationally. We find other Southern cities with much more robust employment growth; for example, Nashville grew 4x as fast (25% growth).

Complacency, unfortunately, is no longer an option for any community. The pace of economic change and increase in competition domestically and internationally has resulted in only two options for communities: growth or decline. Greater Birmingham is facing a crucial moment to speed growth along with its competitor cities.

To address this challenge, the Bold Goals Coalition of Central Alabama commissioned Burning Glass Technologies and the Council for Adult and Experiential Learning to conduct an economic development and labor market analysis to examine the issues and opportunities facing the region. This report offers a view on how Birmingham can expand its economy in the coming years and the workforce requirements needed to achieve that growth. The findings are based on both quantitative review of economic data by industry, employment and job postings data across the region, and qualitative findings based on focus groups conducted with more than 150 local employers. This report is designed to set the stage for collective community action to prepare the region for the future economy.

With this approach, we are able to better understand the challenges and opportunities facing the region. Three overarching findings have emerged in the course of this study, which the Birmingham community – employers, educators, and community leaders, must seek to address to ensure the local economy reaches its full potential:

GREATER BIRMINGHAM'S INDUSTRY MIX IS DISPROPORTIONATELY LOCAL IN A GLOBALIZED WORLD:

Economists speak of “traded” industries that operate in national or international markets, and “non-traded” industries that are purely local. The key industries of Birmingham are non-traded businesses that involve money moving within the region, rather than bringing in wealth from outside through traded industries. As a result the region is missing out on the opportunities available in an interconnected world.

GREATER BIRMINGHAM'S WORKFORCE IS HEAVILY CONCENTRATED IN LOW SKILLED OCCUPATIONS:

As a result of the locally focused industry mix of the region, Birmingham's employers employ a high percentage of sub-baccalaureate roles, such as drivers and retail employees. This presents a dual challenge for the region: workers in these

*The Greater Birmingham seven-county region includes Bibb County, Blount County, Chilton County, Jefferson County, Shelby County, St. Clair County, and Walker County.

¹ U.S. Bureau of Economic Analysis, retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/NGMP16740>.

roles are more susceptible to automation in the coming years and relatively unspecialized talent base is less attractive to industries which might expand in or relocate to Birmingham.

GREATER BIRMINGHAM'S HIGHER EDUCATION INSTITUTIONS PROVIDE POTENTIAL TO DEVELOP GLOBAL INDUSTRIES:

The region's institutions of higher education are graduating students that can drive an innovative evolution to the economy. These institutions, and especially the high achieving graduates in science and health care, can be more actively leveraged to support traded economic growth.

Coming out of the Great Recession, Birmingham has struggled more than other similarly sized cities to return the workforce to pre-recession levels –a goal the nation as a whole accomplished in 2014. The local graduates from post-secondary institutions are not aligned with the local workforce needs, nor are they creating new, locally-based companies to grow employment.

CROSS-CUTTING THEMES

Several themes emerged throughout the analysis of the data and the hours of focus groups and interviews. These themes influence every occupation, every industry, and the future of Birmingham.

A NEW BIRMINGHAM: The city's past economic strength was based on a robust industrial economy, but that is unlikely to be the base of a stable and prosperous future workforce. Birmingham must seek to transform its economy to compete in a marketplace shaped and changed by automation and globalization. Even in areas where Birmingham has seen economic expansion, such as in automotive manufacturing, the future workforce is expected to be smaller than the past as robots take on an increasing share of production work.⁴ Birmingham's challenge will be to pivot its economic and workforce development strategies and assets to capitalize on new areas of economic growth. This includes spurring innovation in legacy industries while at the same time supporting emerging industries that align with Birmingham's business value proposition.

There are positive trends to capitalize on. Even as employment across major traded industries, such as manufacturing, has been flat or declining over the past five years, employment in smaller traded industries such as IT, Upstream Metal Manufacturing, and Transportation and Logistics has grown.

Birmingham's future will be largely defined by the ability of the region to capture and concentrate more growth in these key traded sectors. Unfortunately, the Birmingham region has a lower than average share of traded jobs versus non-traded. As a result, the recovery from the Great Recession has been sluggish and the region struggles to capture economic activity from outside of the region, leading to slower wage growth and personal wealth creation.

ENTREPRENEURSHIP: There is a call from entrepreneurial leaders for more senior leadership talent to take on new ventures and scale strong new businesses locally with the technical talent that is emerging from local universities. The region struggles to attract leaders to drive these important entrepreneurial efforts,⁵ which has ramifications for the future economy as well as today. Economic and occupational growth is tied very closely to young businesses, which create 20% of new jobs.⁶ Increased entrepreneurship, and support for entrepreneurship across the region has the opportunity to greatly support future generations.

IDENTIFYING, CULTIVATING AND RETAINING MANAGEMENT

TALENT: Birmingham's employers spoke frequently of the need for more management talent. First, the region requires middle managers, with a particular focus on employees with 5-10 years' experience and an ability to lead small teams. These employees have been difficult for employers find, and many local college graduates appear to be leaving the region just as they prepare to move from entry level roles into positions with leadership and managerial responsibility. We find supervisory roles in Sales, Production, Nursing, and Operations to take longer to fill in Birmingham than is typical across the country.

SUPPLY AND DEMAND MISALIGNMENT IN THE JOB MARKET:

Local educational achievement is out of alignment with many local employer demands. This includes some areas without enough technical expertise, such as IT and engineering, where there are not enough recent graduates to fulfill employer

⁴ Acemoglu, Daron and Pascual Restrepo. (2017). *Robots and Jobs: Evidence from US Labor Markets*. http://pascual.scripts.mit.edu/research/robots_jobs/robots_and_jobs_2017.pdf

⁵ Focus group with Entrepreneurial leader, August 2017.

⁶ Haltiwanger, John et al. (2013). *Who Creates Jobs? Small Versus Large Versus Young*. *The Review of Economics and Statistics*. https://www.mitpressjournals.org/doi/pdf/10.1162/REST_a_00288

demand for talent. On the other hand, there are fields where the degrees awarded are actually higher than employers seek. For example, in nursing, recent graduates are entering the job market with multiple degrees, but little clinical experience.

EMERGENCE OF HYBRID ROLES AND A NEW SET OF BASELINE

SKILL REQUIREMENTS: The economy is changing, and with it the specific job responsibilities within individual roles. More jobs are hybrids, with technical skills such as coding and data analysis moving into otherwise non-technical roles. Increasingly, employers expect workers across the organization to understand the full range of the business, with a focus on the bottom line and financial impact of decisions becoming a baseline requirement.

RECOMMENDATIONS

This report sets the stage for long-term local action to build both a strong industry mix and a talent base that can sustain employers while providing workers with wages that can sustain a family. The recommendations below speak to the industry and workforce recommendations for the region in order to fill the projected 59,000 annual openings in Greater Birmingham.

INDUSTRY RECOMMENDATIONS

The existing industry makeup of Birmingham is not promoting the level of growth that fulfills the community’s potential. Industry recommendations speak to the opportunities for Birmingham to grow into new areas and expand regional wealth.

Therefore, Birmingham should consider making strong bets in the economic development and workforce spaces in a few targeted areas that represent opportunities for growth.

ADVANCED MANUFACTURING: Birmingham should continue to recruit auto and other manufacturing companies, while building the more highly educated workforce that is required to work in an Advanced Manufacturing plant.

LIFE SCIENCES AND BIOTECH: The strong academic pipeline from the University of Alabama at Birmingham offers an opportunity to develop a biotech and life science industry cluster which can help build regional wealth.

IT: IT is a strong economic driver across the country, and Birmingham should take advantage of the training and partnership developed in the TechHire initiative, and recent major successes such as Shipt to build a strong entrepreneurial IT community that fosters innovation.

Table 1: Employment and Projections by Typical Education

Row Labels	2016 Employment	Annual Openings, Separations (2016-2026)	Annual Openings, Growth (2016-2026)	Growth Rate	Annual Openings, Total (2016-2026)
Typically Sub-Baccalaureate	295,693	36,935	2,925	8.0%	39,860
Typically Baccalaureate	203,186	16,648	2,271	10.2%	18,918
Grand Total	498,879	53,583	5,196	8.9%	58,779

WORKFORCE RECOMMENDATIONS

In order for Birmingham to develop in new industries, it requires the workers to meet those needs. These recommendations focus on the needs to build a talented workforce for both the current and future employer requirements.

INVEST IN TRAINING RELATED TO TARGET INDUSTRIES: To move toward the future Birmingham, the region needs more graduates in technical fields such as IT, engineering, skilled production and a stronger pool of bachelor’s level science workers.

EXPAND CO-OP AND ALTERNATE TRAINING OPPORTUNITIES: UAB and other local institutions should work with employers to determine how to expand these opportunities across both large and small employers.

ORGANIZE AROUND RECRUITMENT OF EXECUTIVE TALENT: Local industry and government leaders should convene to strategize opportunities to attract and retain leadership talent to support the growth industries necessary to truly change the local economy.

STRIVE FOR INCREASED EQUITY THROUGH NON-TRADITIONAL MEANS: Birmingham’s workforce diversity does not reflect the population across occupations, nor is educational attainment consistent (Table 2). It should strive to find alternative training and recruitment vehicles to expand equity.

INCREASE HIGH SCHOOL GRADUATION RATES: The region should leverage its identity as an America’s Promise community to continue seeking equity in graduation rates and college enrollment rates across all counties.

FOCUS ON UPSKILLING TALENT: Birmingham must increase the educational attainment of its citizenry and workforce. Birmingham’s job mix today is disproportionately low-skilled, but this is going to change in the coming years. Over this coming decade, the educational requirements of the local workforce will increase; 40% of the workforce is in current BA-level jobs, while 44% of the projected growth will come from these roles. The region must identify opportunities to address this growth, as projections call for nearly 19,000 annual openings in Bachelor’s-level positions.

Table 2: Graduation Demographics by Degree Level

Degree Level	Total Completers	Percent White
Post-Secondary Certificate	1,874	42.6%
Associate’s/2-year Degree	2,469	47.8%
Bachelor’s Degree	4,115	63.7%
Master’s Degree	2,398	69.7%
PhD	856	75.6%
Total	11,712	59.1%

STRUCTURE OF REPORT

This study draws from a range of sources to understand the economy and workforce demands of Greater Birmingham, including traditional labor market data, job postings analysis, and focus groups.

The study was undertaken first through examination of the local industry composition. This information was used to drive in-depth focus groups with more than 150 leaders from across local industry to gain a deeper understanding of the pressures facing those industries and the workforce they are attempting to build in Birmingham. Finally, these focus group findings were mixed with workforce data to corroborate the statements of local leaders, investigate additional pressures, and provide a view into the future workforce necessary to drive a 21st century Birmingham economy.

This report is being undertaken to support Birmingham's ability to face a changing economy with speed, resilience, and regional control. This is done through a dual lens looking at both the industrial makeup of the local economy and the workforce needs required to supply those industries:

OVERALL ECONOMIC OPPORTUNITY: This section provides an economic development focus. It examines the industrial makeup of the Birmingham economy, and the opportunities

and risks associated with the current economy. Specifically it addresses the following questions:

- What is the current industry makeup of Greater Birmingham?
- What are the emerging opportunity areas for the region?
- How well is the workforce suited to fill the needs of this industry?
- How can the region promote development in new areas?

TALENT AND WORKFORCE: This section will hone in specifically on the needs and opportunities of the local workforce. This section especially focuses on resilience and diversification. Questions addressed in this section include:

- What are the strengths and gaps within the local workforce?
- How well are employers able to fill roles that are needed?
- How are training providers filling the positions that are necessary?
- What can be done to fill gaps?

While this report is undertaken to focus on the workforce of Greater Birmingham, a deep analysis of that workforce requires an understanding of the current industries that drive the regional economy and how those might evolve in the future. From the industrial analysis, we examine regional workforce strategies to prepare a workforce that supports the growth the region may seek to promote.



PART 1

ECONOMIC OVERVIEW

THE EVOLVING INDUSTRY MAKEUP OF THE GREATER BIRMINGHAM ECONOMY

Birmingham's industrial past, and recent transition into an economy heavily influenced by healthcare and local finance, such as retail banking and insurance, has left Birmingham without high-growth traded industries which can serve as a bedrock for robust economic growth and development. The local economy is heavily reliant on non-traded industries such as Health Care and Retail, which enable local economic activity, but do not attract dollars from outside the community. As a result of this, the regional economy follows national trends, but has limited opportunity to grow at a rapid pace and decreased resilience during economic downturns.

Birmingham must look for growth by expanding its industrial base in traded industries and increasing economic interaction with the rest of the nation and world. Identifying opportunities to expand the local economy into new areas, while expanding upon existing strengths, will position Birmingham to push forward into the third decade of the 21st century. Thus, Birmingham should focus on two areas:

- Expanding high-skill employment opportunities within growing traded sectors, such as increasing opportunities for advanced manufacturing workers.
- Promoting growth in new industry areas to capitalize upon the local workforce assets and graduates from local institutions. This can include building on strengths in the healthcare industry to expand into life sciences.

THE TROUBLE WITH NON-TRADED INDUSTRIES

Birmingham - and Alabama's - recovery from the 2008 recession has been slow and uneven, lagging behind national averages in job and wage recovery.⁷ In fact, the region has still not recovered its total pre-recession employment high of 535,000.⁸ While there are a number of factors that have contributed to this tepid growth, one of the primary causes is the mix of industries within the region. The mix of local "non-traded" business compared to "traded" industries that operate globally is critical to the region's ability to grow jobs and increase wages and wealth creation. Research shows communities with robust traded-industry growth are able to benefit from higher wages and increased innovation activity. Nationally, traded sector companies are responsible for nearly 97% of all patent activity, and traded-sector employees earn roughly 50% more than those employed in non-traded industries.⁹

Nationally, traded industries employ roughly 36% of the workforce with non-traded industries accounting for the remaining 64%. However, that 36% represents nearly 50% of the total GDP, income that can then be spent on goods and services within the non-traded industries. The disproportionately high percentage of income in traded industry means that on average, these traded jobs pay higher salaries and result in more personal and community wealth creation.¹⁰ Birmingham's balance is 29% traded (see Table 3: Summary of Employment by Traded vs. Local Industries). This number is well below the national average and below competitor cities such as Nashville and Atlanta, at 36% and 38% respectively. This means that the opportunity for new dollars to be brought into the Birmingham region is much lower than other regions and the corresponding job and wage growth is also lower. Communities without a robust traded industry mix, and the associated "employment multipliers",¹¹ can be harder hit by economic recessions. These communities have a more difficult time rebuilding, due to the fact that that flow of new dollars into the community is slow.¹²

This is not as simple as favoring traded industries over non-traded, however. While traded industries are crucial to economic strength, those that are well represented in

⁷ Brookings Institution. (2017) *The Closing of the Jobs Gap: A Decade of Recession and Recovery*, http://www.hamiltonproject.org/papers/the_closing_of_the_jobs_gap_a_decade_of_recession_and_recovery/

⁸ U.S. Bureau of Labor Statistics, *All Employees: Total Nonfarm in Birmingham-Hoover, AL (MSA) [BIRM801NA]*, retrieved from FRED, Federal Reserve Bank of St. Louis.

⁹ Delgado, M., M.E. Porter, and S. Stern (2014), "Defining Clusters of Related Industries."

¹⁰ U.S. Cluster Mapping (<http://clustermapping.us>), Institute for Strategy and Competitiveness, Harvard Business School. Copyright © 2014 President and Fellows of Harvard College. All rights reserved. Research funded in part by the U.S. Department of Commerce, Economic Development Administration.

¹² Atkinson, Robert et al. (2012). *Worse Than the Great Depression: What Experts Are Missing About American Manufacturing Decline*.

Birmingham are struggling. Eight of the ten largest traded industries, by employment, have relatively flat or declining local employment this decade. This is, in large part, because several of the existing traded industries employ a large portion of low- or middle-skill workers with below-average annual salaries, such as production workers. Many of these jobs are at risk of having components of the work automated by new technology and automation over the coming decade. It will be crucial for Birmingham to address these issues strategically and through wise investments.

Table 3: Summary of Employment in Traded Industries

Region	% of Employment in Traded Industries
Birmingham	28.8%
New Orleans	30.8%
Nashville	35.6%
Atlanta	38.0%
National Average	36.0%

Birmingham needs to align future economic growth and workforce development efforts to traded industries in which the region currently has a competitive strength. Examples of promising traded industries in the region include upstream metals manufacturing or transportation distribution and logistics. Economic developers can look to promote other industries, such as life sciences or information technology, where there is an existing workforce or related firms which can seed growth initiatives. By rebalancing the traded versus non-traded industry employment mix, Birmingham will strengthen its economic resiliency and long-term competitiveness.

TRADED vs. NON-TRADED INDUSTRIES

TRADED INDUSTRIES are defined as those that are produced locally but sold elsewhere, resulting in new dollars coming back to the local economy, and by extension, net wealth creation for employees within that local community. An example of a traded industry within the Birmingham region is the automotive manufacturing at both Mercedes and Honda. Cars made in the region are sold all across the globe, meaning that dollars from other communities are flowing back in to Birmingham in the form of salaries paid to local employees and taxes paid to local government.

NON-TRADED INDUSTRIES on the other hand, exist locally and sell their products and services locally. The growth of these industries is based, in large part, on the existing demand and wealth available to spend on these products and services within the local community. An example of non-traded industries within Birmingham would be local restaurants or real estate services. Due to the fact that the dollars exchanged in these non-traded industries are local in their origin, the opportunity for net new wealth creation is limited. Dollars spent at local restaurants are important to supporting the wages of employees at those restaurants but if they then turn around and spend those wages locally to buy a car or go to a restaurant themselves, that same dollar is simply recycling. This recycling effect is good if it is balanced by a robust pipeline of traded jobs that can constantly infuse the system with new dollars that increase wages and wealth throughout the community.

Table 4: Largest Industries by GDP (2016)¹³

Industry	GDP (millions)	% Total
All Industries	\$62,758	100%
All Private Industries ¹⁴	\$55,871	89%
Finance, Insurance, Real Estate, Rental, and Leasing	\$14,444	23%
Professional and Business Services	\$6,659	14%
Health Care and Social Assistance	\$5,799	9%
Manufacturing	\$5,305	8%

Table 5: Top-10 Traded Industry Clusters in Birmingham

Cluster Name	2010 Employment	2015 Employment	Growth Rate 2010-2015
Business Services	24,847	22,592	-9%
Distribution and Electronic Commerce	20,967	20,098	-4%
Insurance Services	11,327	11,442	1%
Automotive	5,988	5,964	0%
Transportation and Logistics	4,939	5,928	20%
Marketing, Design, and Publishing	5,822	5,765	-1%
Upstream Metal Manufacturing	4,256	5,685	34%
Hospitality and Tourism	5,194	5,274	2%
Education and Knowledge Creation	6,231	5,212	-16%
Financial Services	5,955	4,278	-28%

¹³ U.S. Bureau of Economic Analysis.¹⁴ Private Industries includes all non-government Gross Domestic Product.

Table 6: Top-10 Fastest Growing Traded Industry Clusters in Birmingham

Cluster Name	2010 Employment	2015 Employment	Growth Rate 2010-2015
Information Technology and Analytical Instruments	926	1,642	77%
Upstream Chemical Products	130	185	42%
Upstream Metal Manufacturing	4,256	5,685	34%
Vulcanized and Fired Materials	565	740	31%
Downstream Chemical Products	531	677	27%
Communications Equipment and Services	1,480	1,871	26%
Agricultural Inputs and Services	127	160	26%
Metalworking Technology	1,717	2,109	23%
Transportation and Logistics	4,939	5,928	20%
Downstream Metal Products	1,624	1,889	16%

BUILDING ON STRENGTH: EMERGING INDUSTRY OPPORTUNITIES

While the industries we’ve discussed represent the present Birmingham, Table 6 highlights growing industries that can serve as the basis for continued economic development. These clusters include many higher paying employment opportunities in fields such as advanced manufacturing and information technology.

In addition to investing and focusing on the growing industries above, there was strong desire from the focus group participants to focus on building the life sciences and biotech industries locally. While currently small in terms of local employment (245 employed in biopharmaceuticals in 2015¹⁵), it has tight linkages with healthcare, education and business services – significantly larger local industries.

Life sciences and biotech employers view the industry as one which can grow, due to the local research talent from UAB and because of Birmingham’s status as a regional and national health care leader. The Health Care industry comprises 9% of total regional GDP and has grown 21% since the Great Recession, twice as fast as the economy overall.¹⁶ UAB’s success in earning research grants from the National

Institutes of Health serves as an example of the improving status of the university which ranked 25th nationally in NIH funding in 2016.¹⁷ Transforming Birmingham’s strength in health care, anchored by the University of Alabama at Birmingham (UAB) and the UAB Medical Center, into a stronger driver of the local economy is the best opportunity to leverage existing strength in this high growth industry.

"

We have the bandwidth to support other life science businesses, but the question is how sustainable they are and whether they have the funds and support needed to be a standalone.

"

-Local life science leader

¹⁵ US Cluster Mapping Project. <http://www.clustermapping.us/>

¹⁶ Bureau of Economic Analysis.

¹⁷ Blue Ridge Institute for Medical Research. "Table 10: Ranking of All Institutions including Contracts." http://www.brimr.org/NIH_Awards/2016/NIH_Awards_2016.htm

The ability of the region to leverage this considerable strength in health care into economic growth is predicated in part on translating research funding into industry growth and job creation. The presence of Southern Research, an independent non-profit research and development organization in Birmingham, represents a model for industry growth. Technology commercialization partnerships between UAB and Southern Research such as the Alliance for Innovative Medical Technology (AIMTech),¹⁸ provide a vehicle for job growth through existing business expansion and new business creation. This partnership should be supported and replicated through proactive identification of other companies and areas of commercializable innovation within the life sciences space.

While the local life sciences industry has latent potential, it needs a jump start. Graduates rarely stay local because there are few industry jobs. At the same time, few life sciences firms develop or locate in Birmingham because the workforce is not well developed. Local economic developers must work to break this cycle and support anchor firms. More quantitatively, while there are large numbers of life science Ph.D. graduates - 22% of graduates are at the Ph.D. level - these workers

are leaving the region, or moving toward research and professorships, rather than working in local applied sciences or biotech firms. Our analysis indicates approximately 43% of local college students leave Birmingham after graduation, but this increases to 53% of doctoral graduates.¹⁹ Employers view the curricula as focused on academic research, but desire some focus on addressing the needs of private sector R&D and business operations. As a result, employers find they are able to hire for entry-level positions, but struggle to successfully bring on skilled researchers with the knowledge, training, and experience needed for the private sector.

FAILURE TO LAUNCH: NEED TO BUILD A STRONGER CULTURE OF ENTREPRENEURSHIP

While the region has taken strides to foster entrepreneurship, employers and entrepreneurial leaders cite a fear of taking risks in new fields as a consistent barrier to promote a strong startup culture. The Kauffman Foundation rates Alabama as second to last among large states in terms of startup activity.²⁰ Entrepreneurs cite issues “finding candidates willing to leave their companies,” out of “concern with viability of the company and whether they could easily find a job should the company fail.” Innovation Depot has begun to make strides, with more than 100 companies active in 2016, and \$19.3 million in funding, including approximately \$4 million in venture capital.²¹

This relatively small size of the entrepreneurial community adds to the fear of joining a startup. According to one focus group respondent, “there is a [fully] liquid labor market in [Silicon] Valley. If a start-up fails, you can just go to the next company. We don't have that for Birmingham yet.” This tight labor market, where employees don't know whether a start-up will continue or whether they can find a new job if it fails, exemplifies the risk aversion. This dynamic is present not only for technical jobs, but for the full range of occupations within the entrepreneurial environment, where sales jobs were also cited as extremely difficult to fill.



It's hard to truly find skilled people with a bachelor's or Master's degree. Most people with science degrees do not stay in Birmingham. They go to Huntsville or out-of-state."

- Local life science leader



¹⁸ <https://southernresearch.org/aimtech/>

¹⁹ Based on analysis of LinkedIn data at the institution level. See Methodology section for additional details.

²⁰ <http://www.kauffman.org/kauffman-index/rankings?report=startup-activity&indicator=se-startup-density&type=larger> (Create full footnote)

²¹ Innovation Depot Annual Report. Accessed from https://issuu.com/innovationdepot/docs/id_annualreport_issuu

PART 2

TALENT & WORKFORCE

In order to capitalize on economic expansion opportunities across the Greater Birmingham region in the coming decade, regional leaders, including educators, employers, and policy makers, need a deep understanding of the existing workforce, the skill sets that will be required in the future, and the gaps which will need to be addressed. This section provides an overview of the regional workforce demand as it exists today, and describes projected changes in the future. This workforce analysis focuses on training workers to fill the jobs in the growing, traded industries that will spur overall economic growth.

The local workforce is not lacking the bodies to fill the 59,000 annual openings; it is not broadly struggling to fill the positions today in demand from employers. However, today's workforce skews towards lower-skill jobs that do not readily support a growth-oriented talent and economic development agenda.

Birmingham faces a true chicken or the egg dilemma. The local schools and training providers are developing talent for the job market that exists today, not the workforce that Birmingham can use to promote an aggressive growth agenda in the future. As the region looks to develop its ability to recruit employers in the advanced manufacturing, biotech, and IT sectors, it needs a skilled workforce that can meet the needs of those industries. At the same time, the region must, of course, continue to meet the needs of existing firms.

In this section, we dissect the local labor market to identify where it is strong, and how it might meet the challenges to come. Based on our analysis, there are several crucial areas that need to be addressed. These are critical to the expansion into innovative, global industries envisioned in this report—but they also matter as demands shift for existing employers. These include:

MANUFACTURING STRENGTH: Birmingham's advanced manufacturing sector continues to be critical to the region's economy, and will be so moving forward. Investments by Mercedes-Benz, Honda, and Autocar provide a strong base for the economy, but face national changes to building the future auto manufacturing workforce.

HIGHLY EDUCATED HEALTH CARE PIPELINE: The health care market has a strong pipeline of graduates coming out of UAB, with well-regarded programs in Health Care Administration and large numbers of health practitioners graduating. These programs attract students from beyond the region.

GROWTH OF DIGITAL SKILLS: In recent years, digital skill demands have expanded throughout the workforce, as a result of increased workplace technology requirements. However, this national trend is not well reflected in the local employment demand or in the local workforce, leaving the region susceptible to a growing skills gap to fill the technology-dependent jobs of tomorrow.

SUPPLY - DEMAND MISMATCH: Local colleges and universities do not consistently graduate students in the degree areas that are required by local employers. Some industries, such as IT and Engineering, are undersupplied by local universities, while in others the credentials awarded do not align with the skills that employers need. For example, in manufacturing, the increasing technical complexity of many roles has led to increasing credential requirements. Local training providers are producing graduates with lower credentials than employers now require.

ENTREPRENEURIAL GAP: The region's entrepreneurial community cannot fill executive level roles to lead new ventures to growth that can change the local economy. This lack of seasoned executive level talent can keep high-potential companies from securing growth capital, or worse, keep them from realizing that potential. For those companies who recruit seasoned executives in other cities to serve in management roles, the risk becomes that those senior leaders will eventually move the companies out of Birmingham to be closer to where they live.

EXPERIENCED WORKER AND MANAGERIAL GAP: Current employers struggle to find workers with a degree and several years' experience, as well as mid-level managers.

'NEW BASELINE' AND HYBRID SKILLS: Across roles and industries, employers are looking for workers who can 'wear several hats', performing duties that previously were distinct occupations, leading to a fundamental shift in the nature of work. Many of these redefined roles are being driven by digital skills, which have become essential in many businesses, and by the overall pace of technological change. The basic requirements of roles are shifting, especially with an increasing expectation of business sense across health care, IT, and other jobs.

Collectively these dynamics speak to the need for an overall assessment of the alignment between the skills taught in secondary and post-secondary education, employer training initiatives and the future skill demands in the Birmingham region.

AGGREGATE LABOR DEMAND AND GROWTH

This report focuses on the occupational changes projected for the next decade in order to provide a baseline for economic development and workforce training to build a strong labor pipeline. This timeframe is constrained enough to allow for forecasting, but extended enough to allow Birmingham to consider new strategies to identify and train the retired workforce.

GREATER BIRMINGHAM WILL HAVE 59,000 ANNUAL JOB OPENINGS TO FILL WITH QUALIFIED WORKERS THROUGH 2026: Over the next 10 years, Birmingham will have 59,000

individuals per year entering new positions, either through entering the market or moving to new occupations. Each of these role transitions will require some level of formal or on-the-job training to allow advancement to occur. This represents nearly 12% of total employment annually.

EMPLOYMENT IS PROJECTED TO GROW BY 8.9% OVER 10 YEARS: The overall workforce of Birmingham is projected to grow by 8.9% through 2026.²² The region's projected growth rate is slower than peer cities such as Atlanta and Nashville, and slower than the state workforce overall. The occupational families projected to grow most quickly are Healthcare Practitioners, Healthcare Support, Personal Care and Service, and Transportation and Material Moving. Additionally, more of the growth in Birmingham is expected to be in lower skilled roles, compared to other regions.

BIRMINGHAM'S DECLINING TALENT BASE IS NOT WELL SUITED TO FILL FUTURE LABOR MARKET NEEDS:

Migration patterns indicate that Birmingham's talent base has decreased by a net 1,813 workers (2010-2014) through movement to other cities, or approximately 360 individuals per year. This migration pattern indicates that Birmingham will need to grow the talent pool to build the future economy locally, while working to increase in-migration. The majority of the in- and out-migration is within the state of Alabama. Birmingham will need to continue attracting talent, while increasing its labor force participation rate, 61% in Birmingham MSA compared to 63% nationally.²³ There is variation across the MSA, with a low of just below 49% in Bibb County, to nearly 67% in Shelby County (see Appendix tables).

Table 7: Employment Projections and Growth, Birmingham MSA

Employment	Annual Openings due to Growth	Annual Openings due to Separation	Total Annual Openings
498,879	5,195	53,583	58,779

²²Burning Glass application of Bureau of Labor Statistics projections methodology.

²³Burning Glass analysis of American Community Survey 5-year estimates.

Table 8: Employment and Projected Growth by Region

Location	Employment, 2016	Projected Growth Rate, through 2026
Metro Area		
Birmingham, AL	498,879	8.9%
Atlanta, GA	2,525,370	14.5%
New Orleans, LA	554,474	10.9%
State		
Alabama	1,912,662	9.6%
Louisiana	1,922,170	8.7%
Georgia	4,207,643	14.4%
Tennessee	2,888,717	16.7%

OCCUPATIONAL CHANGES IN THE REGION

The local labor market is changing, due to a range of factors including an evolving industry mix and automation of many low and middle skill occupations. For example, many production roles that have been core to Greater Birmingham’s economy are being upskilled and replaced with more highly educated CNC machinists or engineers. Additionally, occupational growth concentrated in high skill areas such as health care and finance than in administrative and other office roles with less specialized credential requirements.

Table 9 provides a summary of occupational demand and projections for the Birmingham-Hoover Metropolitan Statistical Area (MSA), including the number of people employed in the occupational families in 2016. To provide additional context on job market demand, it also includes annual openings, growth rate, and automation risk, which describe the relative risk that these jobs will be changed or eliminated due to advancing technologies. This data point can be used to identify those roles where workers are at risk and should consider reskills or career change options.



Table 9: Employment Summary by Occupation Family

Occupation Family	Employment 2016	Projected Annual Openings, 2016-2026	Projected Growth Rate through 2026	Automation Risk ²⁴
Office and Administrative Support	83,590	9,409	4.3%	Moderate
Sales and Related	61,765	8,678	2.2%	Moderate
Healthcare Practitioners and Technical	42,177	2,999	20.7%	Low
Food Preparation and Serving Related Occupations	41,155	7,495	11.9%	High
Transportation and Material Moving	38,187	5,162	15.7%	Moderate
Production	32,195	3,925	9.8%	Moderate
Business and Financial Operations	24,040	2,327	13.9%	Moderate
Installation, Maintenance, and Repair	23,183	2,368	10.8%	Moderate
Education, Training, and Library	22,280	2,162	13.8%	Low
Management	21,793	1,859	10.6%	Low
Construction and Extraction	19,595	2,163	12.4%	Low
Building and Grounds Cleaning and Maintenance	14,100	1,800	3.4%	Low
Healthcare Support	13,739	1,895	22.6%	Low
Protective Service	13,180	1,435	4.9%	Low
Computer and Mathematical	12,070	917	13.6%	Low
Personal Care and Service	11,503	1,893	18.9%	Low
Architecture and Engineering	7,338	573	11.3%	Low
Arts, Design, Entertainment, Sports, and Media	5,849	669	9.8%	Low
Community and Social Service	4,190	467	13.2%	Low
Legal	4,028	264	8.2%	Low
Life, Physical, and Social Science	2,682	287	8.9%	Low
Farming, Fishing, and Forestry	240	31	5.8%	Low
Total	498,879	58,779	10.4%	--

Sources: Employment data from Burning Glass application of Bureau of Labor Statistics methodology; automation rate adapted by Burning Glass from research from Oxford University

²⁴Automation risk adapted from: Frey, Carl and Michael A. Osborne (2017). "The Future of Employment: How Susceptible are Jobs to Computerisation?" Accessed from https://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf

LABOR DEMAND BY CREDENTIAL LEVEL

The following tables provide insight into the projected growth by occupations based on typical degree requirements. This data will provide insight into where to focus a supply pipeline over the coming decade.

BACHELOR’S DEGREE JOBS ARE PROJECTED TO GROW BY 10.2%, BUT THE DEGREES LOCAL GRADUATES EARN DO NOT ALIGN WELL WITH EMPLOYERS’ NEEDS: The fastest growing categories of bachelor’s level jobs in Birmingham, as nationally, are in health care and IT. However, local educational institutions are not producing enough graduates to meet those needs. For example, there are six times as many BA-level IT openings as graduates from local institutions.

In focus groups, employers frequently cite a concern that advanced education is being pursued over careers at the bachelor’s level. For example, life sciences employers cite the need for bachelor’s level graduates to do applied work, but find the BA-candidates do not have the applied skills needed due to a focus by academia on theory and preparing students for medical or graduate school.²⁵

On the other hand, the region does not have sufficient employer demand in life sciences and health care management to take full advantage of the corresponding talent graduating from local educational institutions. Birmingham’s local education institutions, particularly University of Alabama-Birmingham, are national leaders in life sciences and health care management; UAB is the second ranked health care management program in the country, 13th in nursing master’s degree programs, and top-50 in biology at both the bachelor’s and Ph.D. levels.²⁶ However, local employers are not able to hire and retain many of these recent graduates. As a result, the region exports talent in areas where it could serve as a national leader.

The most significant growth is in health care practitioner roles, supporting the local hospitals and health care industry, but not yet connecting to the potential traded industries. That these roles project rapid growth and high wages indicates a potential strength of the region to support these industries. Additionally, the IT roles that are likely to grow provide opportunity to expand traded industry if the growth expands beyond the traditional industry mix of Greater Birmingham.

Table 10: Fastest-Growing BA+ Occupations

Occupation	Employment	Growth Rate through 2026	Median Hourly Wage, 2015
Nurse Practitioners	1,040	42%	\$45.05
Speech-Language Pathologists	590	39%	\$31.14
Physical Therapists	950	38%	\$40.33
Software Developers, Applications	1,450	33%	\$38.39
Market Research Analysts and Marketing Specialists	1,350	30%	\$27.85
Financial Examiners	830	29%	\$29.09
Nurse Anesthetists	680	28%	\$70.12
Computer and Information Systems Managers	1,250	27%	\$53.75
Medical and Health Services Managers	980	26%	\$42.66
Software Developers, Systems Software	1,180	25%	\$45.80

Source: *Employment and Growth: Burning Glass application of Bureau of Labor Statistics projections methodology.* Wage: *Occupational Employment Survey.* Minimum 500 employed.

²⁵ Life sciences focus group, conducted by Council for Adult and Experiential Learning, August 2017.

²⁶ U.S. News and World Report Rankings.

SUB-BACCALAUREATE ROLES ARE PROJECTED TO GROW BY 8%, WITH THE FASTEST GROWTH IN TRADES (TABLE 11):

Among well-paying jobs at the sub-baccalaureate level, much of the growth is in skilled trades. This aligns well with the manufacturing base of Birmingham, but also represents a number of jobs in non traded areas – such as carpenters and plumbers – that are at risk in the case of a national economic downturn.

BIRMINGHAM HAS A HEAVILY LOW-SKILLED WORKFORCE

The current demand for workers in the Greater Birmingham area workforce, measured by employer postings, leans heavily toward low- and middle-skill jobs when compared to the nation and to comparative cities. This trend is reflective of the relatively high concentration of retail and transportation industries which commonly hire large number of low-skilled workers such as cashiers and drivers. This dynamic presents unique problems in a digitizing world, as these positions are among those that are growing the slowest, present the greatest wage stagnation, and are at the highest risk of automation in the coming year. In addition, low-skill workers are typically not the backbone of high-growth traded industries, which depend more heavily on technology enabled work.²⁷

Only 21% of the Birmingham workforce demand falls into high-skilled occupations, where high-skill occupations are defined as those where at least 80% of online job postings request a bachelor’s degree or higher. The national average is more than 50% higher (33% high-skilled), and similar cities such as Atlanta, Nashville, and New Orleans also demonstrate a much higher concentration of high-skilled occupations. See Table 12.

Even within the middle-skill workforce, the jobs are disproportionately in slow-growing roles. Birmingham’s demand is more heavily concentrated in middle-skill roles than the national average or other similar cities, with more than 54% of the workforce in these jobs. Middle-skill jobs, such as machinists and administrative assistants, are those that are typically open to sub-baccalaureate candidates while paying a living wage (national average wage of \$15/hour).

Table 11: Fastest-Growing Sub-BA Occupations

Occupation	Employment	Growth Rate through 2026	Median Hourly Wage, 2015
First-line Supervisors of Personal Service Workers	600	24%	\$15.61
First-line Supervisors of Helpers, Laborers, And Material Movers, Hand	890	22%	\$22.49
Plumbers, Pipefitters, And Steamfitters	1,420	22%	\$19.18
Medical Equipment Repairers	560	21%	\$20.70
Control and Valve Installers and Repairers, Except Mechanical Door	510	21%	\$18.92
Installation, Maintenance, and Repair Workers, All Other	590	21%	\$17.96
Carpenters	2,480	21%	\$17.20
Team Assemblers	2,940	20%	\$15.55
Surgical Technologists	630	20%	\$16.54
Medical Records and Health Information Technicians	920	19%	\$15.15

Source: *Employment and Growth: Burning Glass application of Bureau of Labor Statistics projections methodology. Wage: Occupational Employment Survey. Minimum 500 employed.*

²⁷ Burning Glass Technologies. *The Digital Edge: Middle-Skills Workers and Careers*. September 2017.

Table 12: Employment by Skill Level and Digital Demand

Region	Low Skill	Non-Digital Middle Skill	Digital Middle Skill	High Skill
Atlanta, GA	18.7%	7.5%	36.9%	36.9%
Birmingham, AL	24.0%	15.9%	38.7%	21.4%
Nashville, TN	24.0%	6.1%	41.4%	28.5%
New Orleans, LA	27.7%	6.5%	41.6%	24.2%
National Average	21.0%	8.0%	38.0%	33.0%

SUPPLY-DEMAND MISMATCH

At the broadest level, Birmingham’s supply of graduates is sufficient for the regional employment needs. In addition to the nearly 12,000 annual graduates from schools within the metropolitan area, Birmingham attracts graduates from other schools across the state. Additionally, the local institutions tend to award a large number of bachelor’s and higher conferrals, with approximately 63% of local college graduates earning a bachelor’s or graduate degree, vs. 37% earning as associate’s degree, well above the national and state averages for a region. Around Alabama, the University of Alabama and Auburn University graduate more than 14,000 students annually who are potential local employees if they can be recruited to Birmingham. Of these graduates, we estimate that approximately 57% of alumni of Birmingham’s schools remain in the metropolitan area, and 14% of recent graduates from Auburn and Alabama live in Birmingham, resulting in approximately 8,200 new workers per year.²⁸

However, at present there is a supply-demand mismatch between the degrees graduates earn and the jobs and skills that employers demand. This mismatch manifests in three distinct ways, represented in Table 13:

UNDERSUPPLIED SKILLS AND OCCUPATIONS: In some areas, particularly IT, Engineering, and Skilled Production, the local institutions are not graduating enough students to meet employer demands. In these areas, employers face shortages of workers in total, and need to find alternative methods of hiring and advancing the workforce to meet present demand.

“ The business community and student population haven’t seen eye to eye at times. Sometimes, you need to hear from the students about what they are wanting to know about the industry first. It is important to have their voice as we move forward. ”

-Education leader

OVERSUPPLIED SKILLS AND DEGREES: In some areas, Birmingham faces a problem of a highly educated set of graduates who cannot find strong local career options. In areas such as life sciences, there are simply not enough positions to retain the highly educated students emerging from local programs. Birmingham can promote investment in the life sciences industry to better retain these graduates and the economic growth they could enable.

MISALIGNMENT OF CREDENTIALS AND EMPLOYER REQUIREMENTS: Employers report that students often favor advanced degrees over the work experience that will help them succeed in entry level positions. In areas such

²⁸ Burning Glass replicated Brookings Institution research methodology to estimate graduate retention rates based on LinkedIn profiles. See Rothwell, Jonathan (2015). What Colleges do for local economies: A direct measure based on consumption.

as Health Care, employers are finding highly educated, well credentialed graduates who do not have the clinical experience necessary to fill roles and manage teams.

In addition, misalignment and challenges exist in two other distinct areas in Birmingham: the changing skill requirements of existing jobs, and the ongoing search for management talent.

Table 13 displays demand-supply ratios for key occupations necessary for Birmingham to expand economic development in new industries. This table displays:

- Employment and Annual Projected Openings, by Occupation Family

- Total Completions: This is the total number of individuals graduating with relevant degrees across all levels of post-secondary education.
- Ratio of Demand/Supply by degree level. A number over 1 indicates more projected openings than graduates. This ratio is based on the graduates from Birmingham’s schools, as well as the portion of graduates from Auburn University and the University of Alabama, who move to Birmingham after graduation. This ratio includes only those graduates projected to remain in Birmingham.
- Percent of Completers who Remain: This is the estimated proportion of graduates from Birmingham schools that remain in Birmingham after graduation from a post-secondary institution.

Table 13: Ratio of Projected Openings: Supply for Key Occupation Families

Occupation Family	Employment	Annual Openings, 2016-2026	Total Completions, 2015	Sub-BA Openings: Demand/Supply Ratio	BA Openings: Demand/Supply Ratio	Graduate Openings: Demand/Supply Ratio	Percent of Completers who Remain
Supply Gaps							
Computer and Mathematical	12,070	927	433	2.0	6.4	0.3	63%
Architecture and Engineering	7,338	586	885	0.3	1.9	0.3	73%
Production*	32,195	4,020	75	4.2	N/A	N/A	59%
Business and Financial Operations	24,040	2,309	2,310	1.2	2.1	0.2	67%
Misalignment with Industry							
Life, Physical, and Social Science	2,682	282	609	N/A	0.5	0.7	62%
Misalignment with Credentials							
Practitioners and Technical	42,177	2,948	4,176	1.7	1.5	0.3	60%

*Note: Production Sub-BA demand considers only those roles that regularly request a post-secondary credential, such as Inspectors.

SUPPLY GAPS

The changing workforce requirements of the manufacturing industry have ripple effects though much of Greater Birmingham's workforce. Roles which were previously middle-skill roles, easily accessible to workers without a college degree, are both declining and becoming technically more complex. As a result, demand for engineers and skilled production roles are increasing relative to entry level production roles which have the important entry points into the middle class for past generations of Birminghamians. Examining the present supply/demand dynamics of the manufacturing workforce, we find a significant mismatch. There are high numbers of sub-baccalaureate pre-engineering graduates compared to local demand, and an undersupply of bachelor's degree engineers graduating from local institutions.

Manufacturing employers are facing challenges in a changing workforce, with a shift toward more complex technology. Additionally, as the workforce ages, the experienced workers that employers rely on for training and mentorship are retiring, leaving gaps in preparing new workers for the application of their education within a plant.

In Engineering, far more students are graduating with associate's degrees or other sub-baccalaureate credentials than are required in the workforce, by nearly a 2:1 ratio. This may lead to a middle skill crunch in the coming decades, with employers seeking the bachelor's-level workforce that will come in and execute against the company mission.

There are not enough bachelor's degree candidates graduate from local universities to meet employer demand; there are nearly twice the number of openings as new degree holders. This could, in part, be solved by increasing the retention of local graduates, as we estimate nearly 240 graduates - 27% - leave each year.

A similar dynamic exists for the production workforce; while many of the sub-baccalaureate roles do not require post-secondary education. Roles that frequently require bachelor's degree do not have an educational pipeline. Managerial roles, such as Production Supervisor, which are increasingly a bachelor's level role (38% of postings specify this requirement,²⁸ compared with 16% of those employed in the job)²⁹ have proven difficult for local employers to fill, taking an average of 54 days to fill. These must be filled either through internal training or recruiting from non-production areas.

Engineering and Production

Occupation Family	Employment	Annual Openings, 2016-2026	Total Completions, 2015	Sub-BA Openings: Demand/Supply Ratio	BA Openings: Demand/Supply Ratio	Graduate Openings: Demand/Supply Ratio	Percent of Completers who Remain
Supply Gaps							
Architecture and Engineering	7,338	586	885	0.3	1.9	0.3	73%

²⁸ Burning Glass job postings database.

²⁹ American Community Survey 5-year sample.

Information Technology

Occupation Family	Employment	Annual Openings, 2016-2026	Total Completions, 2015	Sub-BA Openings: Demand/ Supply Ratio	BA Openings: Demand/ Supply Ratio	Graduate Openings: Demand/ Supply Ratio	Percent of Completers who Remain
Supply Gaps							
Computer and Mathematical	12,070	927	433	2.0	6.4	0.3	63%

In IT, the gap in available supply is much more pronounced. The region's schools are graduating too few IT workers to meet local workforce needs, especially at the bachelor's level, where there are more than six times as many openings as graduates. This challenge will be exacerbated as more non-IT functions take on IT skill sets, such as in Health Informatics, further stretching the limits of available talent. Across industries, employers cite challenges recruiting IT talent, in part because employers have been admittedly slow to hire workers in emerging fields such as cybersecurity and big data.

IT employers also face struggles to expand operations quickly due to the small size of the local workforce. While there has been some development in the technology entrepreneurship community, the lack of a broad infrastructure exacerbates

the risk of trying something new and has limited the total growth in entrepreneurship and related workforce. Shipt, for example, maintains a presence in Birmingham but has also expanded offices in San Francisco where the pool of talent is larger.³¹

While the demand for IT talent increases across industries, the region also has begun to invest in new areas to build a future workforce that can spur economic growth and development. Short-term bootcamp programs are one strategy to accelerate the development of an IT workforce. Birmingham should continue to capitalize on the strong work of local bootcamps through Innovate Birmingham, which project to train 925 disconnected youth in the next four years, thus taking strides to address IT programs for a diverse set of workers.³²

Business and Financial Operations

Occupation Family	Employment	Annual Openings, 2016-2026	Total Completions, 2015	Sub-BA Openings: Demand/ Supply Ratio	BA Openings: Demand/ Supply Ratio	Graduate Openings: Demand/ Supply Ratio	Percent of Completers who Remain
Supply Gaps							
Business and Financial Operations	24,040	2,309	2,310	1.2	2.1	0.2	67%

³¹ Note: Shipt was purchased by Target at the completion of this report.

³² Training data provided by Innovate Birmingham.

Birmingham's Finance and Insurance industry struggles to fill roles with graduates from the local schools. Employers voice frustration at filling the customer service and support roles crucial to a retail banking operation. We find this in the time it takes to fill jobs: Teller jobs take 31 days to fill on average in Birmingham, and customer service representatives take 39 days, both longer than the national average. This is due in part to the hybridization of many traditional banking jobs; tellers require sales skills; entry-level IT support positions require more advanced skills to work in banks. In addition to the need for more bachelor's-level graduates to enter the field and help it advance, the skills are shifting in finance, as artificial intelligence has "changed the way traditional branches function," according to a local finance leader. This indicates that the supply gap below understates the real need, as executives expect to need to train the existing workforce for immediate and long-term sustainability.

MISALIGNMENT WITH INDUSTRY OPPORTUNITIES

The life sciences workforce, given its focus on research and development roles, typically requires workers with bachelor's level or higher credentials. Graduates of relevant programs often expect to be academic researchers or professors, upon graduating. As the region seeks to expand in the private sector, ability to bring graduates into the life science industry will be critical to expansion. Employers speak of changing skill sets for life sciences employees from pure to applied research. The "saturation" of Ph.D. graduates, as employers

see it, provides an opportunity for academic institutions to shift training toward skills necessary for success in the for-profit sector.

Employers in Birmingham face a dilemma. On one hand, employers express frustration with the basic science skills possessed by graduates of bachelor's degree programs. As one employer said, "We've had a tremendously difficult time recruiting from Birmingham for positions like lab workers, trained microbiologists, and more advanced research positions. We give them a lab test and they can't pass it."³³ On the other hand, employers struggle to recruit students with more advanced credentials into industry. The lack of a strong entry level talent pool has had direct repercussions on the region, with a renewed focus on experience.

This struggle in the biotech industry led to the creation of a biotech master's degree program at UAB. Additionally, UAB has worked to expose Ph.D. candidates to industry-required skills such as scientific writing and patent law through the UAB Experiences Program. These efforts provide a backbone for a future workforce, but require a growth in industry that has struggled to gain traction to date.

Life Sciences Workforce

Occupation Family	Employment	Annual Openings, 2016-2026	Total Completions, 2015	Sub-BA Openings: Demand/Supply Ratio	BA Openings: Demand/Supply Ratio	Graduate Openings: Demand/Supply Ratio	Percent of Completers who Remain
Misalignment with Industry							
Life, Physical, and Social Science	2,682	282	609	N/A	0.5	0.7	62%

³³ Life Sciences focus group. Conducted by the Council for Adult and Experiential Learning, August 2017.

Table 14: Higher Education Graduates by Degree Level

Row Labels	Sub-BA	BA	Grad
Birmingham, AL Metro Area	37.1%	35.3%	27.6%
Alabama, Statewide	32.7%	46.0%	21.2%
Nationwide	40.1%	40.7%	19.2%

MISALIGNMENT OF CREDENTIALS

Health Care

Occupation Family	Employment	Annual Openings, 2016-2026	Total Completions, 2015	Sub-BA Openings: Demand/Supply Ratio	BA Openings: Demand/Supply Ratio	Graduate Openings: Demand/Supply Ratio	Percent of Completers who Remain
Misalignment of Credentials							
Healthcare Practitioners and Technical	42,177	2,948	4,176	1.7	1.5	0.3	60%

“ There’s just not enough nursing students coming out of the school. We’ve done some research on this actually. The problem is not that there aren’t enough applicants, but not enough instructors to train. So, what we are seeing is an increasing competitive applicant pool to nursing schools because schools are having to limit the number seats available due to the lack of instructors and have raised their standards for admitting students to deal with the shortage. ”

-Health care leader

In Health Care, the volume of supply looks appropriate but the quality of workers is not satisfying employer needs. While the local schools are graduating enough students, these students are in many cases overeducated for the job that needs to be done, as seen with a demand-supply ratio (.3) reflecting more than three times the number of graduates as job openings. This was a specific point of concern among health care employers, who see far more advanced practice nurses than they require, with not enough candidates for jobs with clinical experience. In Nursing, there were more than 500 master's degree graduates in 2015 – or approximately 300 projected to remain, versus only 142 postings requesting a graduate degree.

Employers find that they do not find enough nurses at all, as a result of this mismatch.

MANAGEMENT AND CHANGING SKILL SETS

Middle management roles – those requiring 5-7 years of experience – are difficult to fill across all industries

All industry groups consulted for this report cited difficulty finding job candidates with the following characteristics.

- Have at least an associate's degree, but more often a BA or higher
- Have at least five years' worth of work experience, but no more than 10 years

Many HR leaders in the focus group discussions spoke of the difficulty of hiring for this specific demographic, who commonly train entry level workers, lead small teams, and provide a base of future leadership talent that organizations can promote and develop. The characteristics associated with this particular type of worker are commonly associated with individuals that are approximately 25-39 years old. Birmingham's stock of individuals in this age group is roughly in line with that of the nation as a whole, but are slightly below other benchmark metro areas such as New Orleans and Atlanta.

Healthcare leaders spoke of the intense competition for registered nurses with these particular characteristics, including the need for team leadership skills. Major hospital

networks compete for a limited supply of nurses that fit this particular profile, which leads to some employers feeling wary of investing too much into young employees (as one focus group participant put it, "they jump ship for a hot penny"). Employers report little problem hiring new graduates, but those graduates are not capable of taking on many of the responsibilities given to nurses with five or more years' worth of experience. With nearly 7,000 annual openings, Registered Nurses are one of the highest-demanded occupations in the region. This challenge results in employers taking longer to fill critical supervisory and managerial roles.

Table 15: Proportion of Experienced Workers (25-39 Years Old) in Population (2015)

Geography	Total Number	Proportion
Atlanta	1,200,000	21%
Birmingham	230,000	20%
Nashville	930,000	19%
New Orleans	280,000	22%
National Average	64,400,000	20%

Table 16: Time to Fill of Select Supervisory and Managerial Roles

Role	Time to Fill	Comparison to National Average
Sales Supervisor	63 days	Much Harder
Production Supervisor	54 days	Much Harder
Construction Manager	53 days	Harder
General Manager	46 days	Harder
Director of Nursing	45 days	Harder
Human Resources Manager	45 days	Harder
Health Information Manager	43 days	Similar

GROWING A WORKFORCE OF THE FUTURE

Employers specifically cite a worry that their roles lack the excitement necessary for building an IT workforce. “We don’t have the big modern building to recruit the best and brightest,” said one Finance leader. As another stated, “we need computer science talent, but we’re still asking students to use COBOL,” a programming language invented in the 1950s.

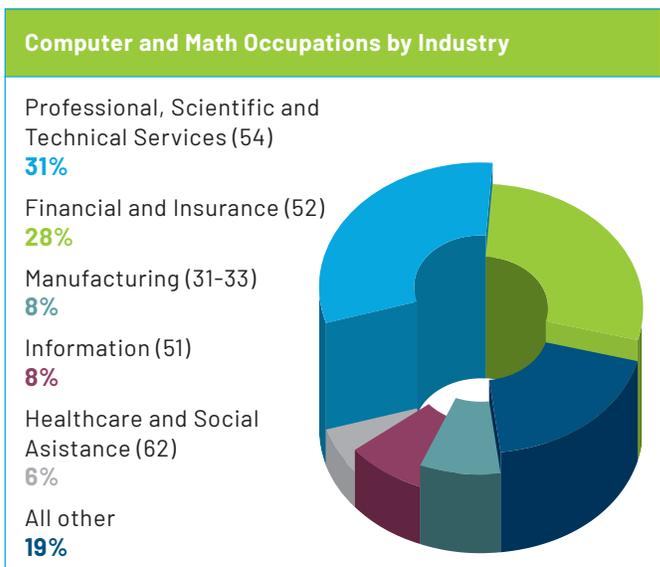
We find this in the industry breakdown of job postings; more than 28% of the regional IT workforce is in the Finance and Insurance industry, nearly double the national average (15%).

Employers admit delayed adoption of the tools required for the workforce of tomorrow, a problem exacerbated by a perceived reluctance of older employees to learn new skills. For example, manufacturing employees indicate they have been slow to shift toward adopting data within the organizations, and are just now beginning to hire to “understand big data and how it fits into their large ecosystem.”

This delay crosses industries and occupations; finance and insurance employers cite a slowness in adopting cybersecurity infrastructure and workforce. Manufacturing employers state they’ve been slow to adopt big data to improve operations. Employers see older workers “reluctant to adapt” to new technology, and choosing to retire instead, and new workers looking to use the latest technologies may shy away from roles that they do not view as innovative.

“ We have shifted our infectious disease work to a [coastal] state, primarily because of available workforce. **”**

-Local employer



THE GROWING IMPORTANCE OF HYBRID SKILLSETS

The 21st century has led to a growth of hybrid roles, which merge otherwise distinct skill sets. For example, the emergence of product management jobs, user experience positions, and digital marketing represent jobs that exist because of a convergence of technology and other management skills.³⁴ In Greater Birmingham, employers speak frequently of a set of hybrid roles, where technical skills are only valuable in the context of a broader set of business understanding.

As roles hybridize, employers are looking for workers with strong technical skills and a high level of proficiency in “soft skills”, such as communication and problem solving. However, finding workers with this balanced skill set is a challenge for employers:

TRAINING PROVIDERS ARE UNCLEAR OF HOW EMPLOYERS RECRUIT FOR SOFT SKILLS: Employers demand soft skills such as communication and teamwork, and often use tests to assess candidates. However, training providers ask for specificity around how testing is done and the manner in which they can support proper training. Employers struggle to find candidates with the mix of interpersonal and communication skills required to succeed across occupations.

PROBLEM-SOLVING SKILLS ARE A PAIN POINT: Employers cite the need to find candidates who can respond quickly and efficiently to challenges that arise. For example, as industries rely more on IT, the IT support workers must respond with greater immediacy to prevent loss of business. Problem solving thus reaches beyond technical skills and involves an agile work environment to keep the business functioning.

HYBRIDIZING SKILLS IN FINANCE AND INSURANCE: These industries are particularly aggressive adopters of digital technologies, while still requiring workers to possess traditional domain knowledge. For example, legal analyst roles require more understanding of data security in order for the organization to meet compliance requirements. Additionally, tellers are increasingly expected to be “revenue producing”, with more focus on sales and shifting customers across a bank’s numerous functions.³⁵

IT SKILLS FOR BUSINESS WORKERS AND BUSINESS SKILLS FOR IT WORKERS:

Increasingly, employers have expressed a desire to hire IT professionals who have some basic business skills. These workers need a holistic understanding of the business that allows them to directly connect technology solutions to business opportunities. This includes customer service skills, now the second most-demanded skill for Computer Support Specialists.³⁶

HEALTH CARE AND THE CONTINUUM OF CARE: As the Health Care industry shifts toward providing a “continuum of care” model, employees must be able to address the long-term impact of their decisions. For a care team, this involves combining traditional clinical skills, new medical coding skills (such as ICD-10), and a deeper understanding and consideration of medical billing. Hospitals want to avoid having patients return for the same complaint, both for the patients’ sake and because it impacts the ability to put in claims for payment. “We have to stress to everyone in the field that treatment does not end when the patient leaves our building, it is the follow up and continuity of the care that is important to avoid re-entry into our sphere,” said one Health Care leader.

COMMUNICATION AND PROJECT MANAGEMENT: Employers increasingly seek communication and project management skills from their employees. IT employers speak to the need to “push products out the door,” which requires significant project management skills to reach this final stage.

³⁴ *Blurring Lines: How Business and Technology Skills are Merging to Create High Opportunity Hybrid Jobs*. Burning Glass Technologies. <http://burning-glass.com/research/hybrid-jobs/>

³⁵ *Finance and Insurance focus group*. Conducted by the Council for Adult and Experiential Learning, August 2017.

³⁶ *Burning Glass Technologies job postings database*.

RECOMMENDATIONS

Birmingham, like many cities of its size and historical industrial makeup, is competing with regions around the globe for future economic growth. Past performance and legacy success are no longer indicators of future success, as communities and industry reinvent themselves to take advantage of new technologies and industry trends.

This new normal requires communities to be evermore aligned and efficient with their economic and workforce development efforts. If Greater Birmingham is to succeed in securing sustained economic growth, economic development and workforce development stakeholders and strategies will need to be aligned. Perhaps most importantly, this alignment must also include an amount of ambition with regards to the companies and workforce of the future. As has been chronicled in this study, Birmingham's current industry mix will need to evolve and move forward to ensure that family-sustaining jobs are available to a workforce that is ready to fill those jobs.

As community leaders set their growth agenda, economic development efforts in business expansion, attraction and entrepreneurship should strike a balance between supporting existing industry and leveraging a cluster-based approach to identify emerging companies and jobs.

Assessing from the point of view of the workforce opportunities can be helpful in identifying some of these aspirational industry clusters. Ensuring that education and workforce training are teaching leading principles and skills, and that existing industries continue to have access to the talent that is needed to remain globally competitive and expand in the Birmingham area is critical. Similarly, centers of excellence and innovative programming can produce specialized talent in quantities that are attractive to businesses who are looking for communities in which to locate new facilities and offices. Finally, leading university research and advanced education offerings can foster entrepreneurship and the kinds of homegrown companies that result in substantial job growth.

Birmingham's economic and workforce development leaders must come together to identify several industries, or sub clusters of industries, in which to make big bets on the future. The information contained in this report, as well as others should inform those decisions. Once a portfolio of growth has been identified, resources should be aligned to ensure that all elements of economic and workforce development are pursuing the same goals. Only through collaborative, efficient use of limited resources can Birmingham maintain and grow its economic base.

This is a critical moment in Birmingham's history. Birmingham struggled to rebound from the Great Recession, and has an economy built around industries that have limited growth in the 21st century. This is a time for the region to make economic and workforce decisions that will allow the region to both recruit and build new industries, while honing in on the areas of strength to build a sustainable future economy.

INDUSTRY RECOMMENDATIONS

The existing industry makeup of Birmingham is not promoting the level of growth that fulfills the community's potential. The reliance on local, non-exporting industries means there is too little money flowing into the region from elsewhere, hindering economic growth. Much of Birmingham's traded industrial sectors are legacy manufacturing that do not require a workforce as large as in the past, which has resulted in declining levels of employment.

Therefore, Birmingham should consider making investments in economic and workforce development in a few targeted areas that represent opportunities for growth.

ADVANCED MANUFACTURING: Birmingham has a rich manufacturing history, and several of the fastest growing industries in the region are specialized subsets of manufacturing. The recent growth of automobile manufacturing in Greater Birmingham is a strong signal that it can develop as an advanced manufacturing hub. Birmingham should continue to recruit and expand these industries while building the more highly educated workforce that is required to work in an Advanced Manufacturing plant.

LIFE SCIENCES AND BIOTECH: The strong academic pipeline from the University of Alabama at Birmingham offers an opportunity to develop a biotech and life sciences cluster. The region is a research leader, as evidenced by the funding it attracts from NIH and the large number of patents awarded at UAB,³⁷ but it exports most of the talent it trains to other regions. Birmingham should continue to leverage the Innovation Depot in targeted ways to move toward increasing the number of new businesses emerging in target industries.

IT: IT is a strong economic driver across the country, and while the local workforce is relatively small, Birmingham should take advantage of the training and partnership developed in the TechHire initiative, and recent major successes such as Shipt to build an entrepreneurial IT community that fosters innovation and builds toward companies that grow and remain in Birmingham. Importantly, these targeted strategies require public-private cooperation, such as the initiative which led to the creation of the Innovation Depot. Local companies, in the interest of improving the local economy, should support their workers' efforts to build additional enterprises. As one employer stated: "My chemist could start a company, my biologist could start something, etc. There's lots of potential moving in and out, which, in the end, will help establish the area as a powerhouse."

WORKFORCE RECOMMENDATIONS

In order for Birmingham to develop in new industries, it requires the workers to meet those needs. Employers speak to the need to diversify the workforce, not only for gender and racial equity reasons but also from a business perspective. Financial industry employers cite diversity as a way to expand the business. Said one leader: "We have seen that sales go up in communities in which they have people that look like them. We want to invest in this a bit more." Employers and training providers can work together to expand the pool of applicants, increasing both labor force participation in these jobs and improving the business' bottom line.

INVEST IN TRAINING RELATED TO TARGET INDUSTRIES: To move toward the future Birmingham, the region needs more graduates in technical fields such as IT, engineering, skilled production and a stronger pool of bachelor's level science workers. The regional schools are not graduating and retaining enough students in these areas. Increased and better aligned investments in training, both traditional and non-traditional, in these areas will be crucial to success.

EXPAND CO-OP AND ALTERNATE TRAINING OPPORTUNITIES: Employers speak of the increased difficulty in providing training to young workers as experienced workers retire. Large firms, such as Honda and Mercedes, have successfully implemented internship and co-op programs to bring students in for on-the-job training. UAB and other local institutions should work with employers to determine how to expand these opportunities across both the large employers and smaller ones that are unable to sustain such programs individually. As one employer said, "If you are in school and do not do any training or apprenticeship, you will have a hard time finding a job afterwards."³⁸

ORGANIZE AROUND RECRUITMENT OF EXECUTIVE TALENT: In focus group sessions with entrepreneurs and established industry executives, participants expressed concern about the ability of Birmingham to attract and retain strong leaders to envision, establish, and grow new enterprises. Some of this challenge comes from cultural inertia, a hesitance of local workers and leaders to leave their current jobs, and comes from lack of ability to recruit external talent to the region. Local industry and government leaders should convene to strategize opportunities to recruit this talent and support the risk taking necessary to truly change the local economy.

RECONSIDER CREDENTIAL REQUIREMENTS: Said one IT leader: "There is literally no supply of (software) developers with at least 5 years of experience. So, of course, we can't find any with 7 years of experience." In discussing this further, leaders agreed that this talent is in the region but that employees are less apt to leave jobs due to the desire for job security, or because they do not have the credentials required in the job description.

STRIVE FOR INCREASED EQUITY THROUGH NON-TRADITIONAL MEANS: Birmingham has several programs targeted at non-traditional learners, such as through bootcamps³⁹ and Innovate Birmingham, which can support the development of more equitable access to jobs and opportunity. Continuing to identify opportunities for this type of high-potential, non-traditional programming will be critical to shifting the workforce. By supporting the training of all workers, the full economy will rise up. With increased innovation in communities of color in the short term, Birmingham is more likely to see the children of today's workers grow into the innovative workforce required for the future.

³⁷ *The Economic Impact of UAB (2010)*, Tripp Umbach.

³⁸ *Construction, Engineering, and Manufacturing Focus Group*.

³⁹ *Bootcamps are a form of rapid skills training which have grown in recent years. There has been growth especially in IT and coding.*

INCREASE³⁹ HIGH SCHOOL GRADUATION RATES: The region should leverage its identity as an America's Promise community to continue seeking parity in graduation rates and college attendance rates across all counties. In order to build a diverse workforce across industries and occupations that are able to serve the full community and create future wealth, the region must continue pushing toward equity in education to build the diverse labor force.



³⁹ America's Promise Alliance is an organization dedicated to "create the conditions for success for all young people", including through dedication to education. See <http://www.americaspromise.org/birmingham-al> for more information.

APPENDIX

APPENDIX 1: AUTOMATION

As the nation considers how to handle a computerized world and increasing likelihood of automation of jobs, Birmingham must consider the local impact. Table 17 displays the top jobs at risk of automation in Birmingham, based on the number of actual employed jobs that face some risk of automation. The results are a number of jobs which are highly concentrated in the local economy, especially office-based finance and insurance jobs such as Bookkeeping, Accounting, and Auditing Clerks, Accountants, and Claims Adjusters.

On the other hand, a number of ‘safer’ jobs fall into advanced occupations that typically have lower local concentration. This low-risk list includes two critical areas for the Birmingham economy based on employer feedback: these roles are the IT and managerial roles that employers often cite difficulty filling, despite low concentration. There are exceptions here: interestingly, Nurse Practitioners are highly concentrated and at low risk of automation; at the same time, local schools are graduating a large number of advanced practice nurses. Employers cited this as a challenge, but this may present opportunities as the workforce continues to become more advanced.

Additionally, it is important to look at the risk of automation against the workforce. Both the low- and high-risk occupations have a mix of diverse and non-diverse occupations.⁴¹

Table 17: Top 10 Jobs at Risk of Automation

Occupation	Jobs at Risk	LQ	Diversity (Alabama)
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	11,750	1.5	Low
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	7,565	1.8	High
Bookkeeping, Accounting, and Auditing Clerks	7,409	1.3	Medium
Heavy and Tractor-Trailer Truck Drivers	6,960	1.4	Medium
Customer Service Representatives	5,522	1.0	Medium
Accountants and Auditors	4,803	1.1	Medium
Insurance Sales Agents	2,475	1.9	Very Low
Claims Adjusters, Examiners, and Investigators	2,342	2.4	Low
Billing and Posting Clerks	2,246	1.3	Medium
Industrial Truck and Tractor Operators	2,167	1.2	Medium

*Note: Limited to jobs paying a living wage (\$15/hr)

⁴¹Note: Demographic data is available statewide due to sample size.

Table 18: Lowest Automation Risk (min. 500 employed)

Occupation	Jobs at Risk	LO	Diversity (Alabama)
Healthcare Social Workers	610	1.1	High
Speech-Language Pathologists	590	1.2	Medium
Educational, Guidance, School, and Vocational Counselors	660	0.7	High
Nurse Anesthetists	680	4.8	Very low
Mechanical Engineers	590	0.6	High
Medical and Health Services Managers	980	0.8	High
First-Line Supervisors of Mechanics, Installers, and Repairers	2,400	1.5	Low
Computer Systems Analysts	1,360	0.7	Low
Nurse Practitioners	1,360	1.9	Medium
Architectural and Engineering Managers	630	1.0	Low

APPENDIX 2: EQUITY

In addition to the historical industry mix, Birmingham faces unique challenges as a fractured community. According to recent research, several ZIP Codes in Birmingham are among the most ‘distressed’, a measure of education rate, housing vacancy rate, median income, and poverty, among other factors.⁴² This factor provides a challenge, but also an opportunity to Birmingham to take control of its destiny. The large number of adults out of the workforce represent potential talent to reengage in a new economy. Workforce concerns must be taken at a regional level, understanding commuting areas, in order to get the best talent through employers’ doors.

Employers are diversifying their workforce, but state difficulty identifying processes to recruit women and candidates of color into roles that have historically been filled by older, white males.⁴³ This concern crosses areas, where employers seek to diversify the workforce in order to best serve their customer base.

EDUCATIONAL ATTAINMENT AND EQUITY

These challenges are reflected in the educational disparities as well, with graduation rates across the region varying by district, and by race. In general, white students are obtaining higher education credentials than non-white counterparts, especially African American students. School districts in predominantly white areas have higher graduation rates, and the higher education attainment skews toward white students as levels increase. These disparities will provide roadblocks to future equity goals as employers increase their education credential demand.

Across degree areas, white students graduate with bachelor’s degree more frequently than with sub-Baccalaureate credentials (Table 20). In an economy with increasing demand for bachelor’s degrees, this can lead to further fragmentation of the economy. These students meet the employer qualifications more frequently, and are more likely to work the jobs that are growing and safe from automation.

⁴² <http://eig.org/2017-dci-map-national-zip-code-map>

⁴³ Entrepreneurship focus group, conducted by Council for Adult and Experiential Learning, August 2017

Table 19: Graduation Rate by County, 2016

School System	Total Graduation Eligible	Graduation Rate	% African American/ Black
Bibb County	262	85%	27%
Birmingham City	1,720	80%	96%
Blount County	621	91%	0%
Chilton County	517	86%	15%
Jefferson County	2,806	91%	48%
Shelby County	1,387	95%	15%
St Clair County	600	89%	14%
Walker County	591	90%	6%

Table 20: Graduation Demographics by Degree Level

Degree Level	Graduation Rate	Percent White
Post-Secondary Certificate	1,874	42.6%
Associate's Degree	2,469	47.8%
Bachelor's Degree	4,115	63.7%
Master's Degree	2,398	69.7%
PhD	856	75.6%
Total	11,712	59.1%

UNEMPLOYMENT AND LABOR FORCE PARTICIPATION (SEE TABLE 21)

Unemployment is steadily and rapidly decreasing in Birmingham, falling from 6.2% in January 2017 to 3.1% in September, 2017.⁴⁴ Across Alabama, however, the impact on unemployment is not consistent across all groups. The tables below display labor participation data as of the 2016 American Community Survey, and demonstrate the discrepancies by race and across the metropolitan area.

While the participation rate is consistent between white and black individuals, unemployment in the black community is more than double the white rate, at nearly 12%. Multiracial individuals have similar unemployment rates.

This challenge is not unique to Alabama, but the region can aim to fill in some gaps by focusing training, especially for

underrepresented groups, on those occupations that are projected to grow. This includes looking both at the overall projections, and taking into account the risk of automation. Similarly, the region should strive to increase the labor force participation rate.

BACKGROUND CHECKS LIMIT THE WORKFORCE: In manufacturing, employees cite the challenges associated with workers passing background checks. “These are minor drug offenses and criminal records. But our contractors are strict on who they will allow to work on their property and we have no choice but to oblige.” Employers across skilled trades – manufacturing, plumbing and electrical work, reference that the requirement to have background checks to take jobs limits the pool of talent that could be trained through apprenticeship or other programs.

Table 21: Labor Force Participation and Unemployment by Race, Greater Birmingham 2016⁴⁵

Race	Population, Age 16+	Labor Force Participation Rate	Unemployment Rate
White alone	615,403	60.4%	5.6%
Black or African American alone	252,614	60.8%	11.9%
Some other race alone	13,792	74.5%	6.2%
Asian alone	11,870	70.5%	1.8%
Two or more races	9,667	61.3%	11.5%
American Indian and Alaska Native alone	2,305	59.9%	15.9%
Native Hawaiian and Other Pacific Islander alone	228	64.5%	15.7%
Grand Total	905,879	60.9%	7.4%

⁴⁴ Alabama Department of Labor data.

⁴⁵ Note: unemployment rate is collected on a monthly basis. However, the detailed rates, broken out by race, are available via the American Community Survey, and lag behind. These data thus are higher because they predate some of the job gains of 2016, 2017.

APPENDIX 3: METHODOLOGY

This study draws from a range of data sources and analytic approaches including traditional economic data, job postings analysis and in-depth focus groups. Below, we provide additional detail on the sources and methodology for the data included in this report.

ABOUT BURNING GLASS POSTINGS DATA

To supplement traditional sources of labor market data with more comprehensive and up-to-date information on employer demand for jobs and skills, Burning Glass has mined its comprehensive database of over 100 million unique online job postings dating back to 2007. Burning Glass's spidering technology extracts information from close to 50,000 online job boards, newspapers, and employer sites on a daily basis and de-duplicates postings for the same job, whether it is posted multiple times on the same site or across multiple sites. All Burning Glass postings data in this report reflects all job postings collected in the U.S. during the 12 month period, July 2016-June 2017.

In this report, job postings data is used primarily to measure the skills and credentials that are in demand by employer. These data are uniquely able to assess the specific skills that employers request in real-time and segmented by location, industry and other factors not possible using traditional, static skill profiles.

The occupations projected included in this report are based on those developed by the Bureau of Labor Statistics and the Alabama Department of Labor. For this project we have implemented the technical approach developed by the Bureau of Labor Statistics for the 2016-2026 projections which provides improves substantially upon the methods currently used. This improved method results in substantially higher number of projected occupational openings than the current methodology.

In particular, the old method assumes that workers enter a field at a young age, work in their field until they are old, then retire. The new framework allows for the reality that many workers will work in multiple occupations over the course of their careers.

Table 22: Labor Force Participation by County⁴⁶

County	Population, Age 16+	Labor Force Participation Rate
Jefferson County	523,961	62.0%
Shelby County	161,389	66.9%
St. Clair County	68,812	59.7%
Walker County	52,724	50.8%
Blount County	46,007	49.9%
Chilton County	34,490	55.5%
Bibb County	18,496	48.7%
Grand Total	905,879	60.9%

The new methodology breaks occupational demand into three parts: openings due to occupational growth, openings due to workers retiring (or otherwise permanently exiting the workforce), and openings created by workers moving to different roles, but staying in the workforce. This third category is not captured in the current models and accounts for the difference between the data included here and the lower projections numbers that are currently provided by state and federal statistical agencies. Beginning with the 2016-2026 projections, this method will become the standard way of tracking openings.

All projections included in this report represent the aggregate of the 10-county region of the study. 2015 employment estimates are based on OES employment data and state and national projections.

ABOUT GRADUATE RETENTION ANALYSIS

To develop an estimate for the migration patterns of post-secondary graduates, we recreated an analysis done by the Brookings Institution looking at LinkedIn's alumni tool. Using this tool, we estimate the number of graduates from each regional institution that remain in Birmingham following

⁴⁶Burning Glass analysis of American Community Survey 5-year estimates.

graduation. For institutions that have no representation on LinkedIn, primarily trade schools, we conservatively include all graduates as part of the local workforce.

Based on the sample of graduates with LinkedIn profiles, we measure the proportion who list Birmingham as their current location. We apply those proportions to individual programs and degree levels to estimate the full number of students by occupations and degree level who remain in Birmingham.

Limitations to this approach include the following: it assumes the proportion of students with LinkedIn profiles is a representative sample with no respect to geography, and that the data is up to date. Because we are not able to segment the data, it assumes that students from a given institution are equally likely to stay in the region or leave regardless of program or degree level. This likely overstates the number of baccalaureate and post-baccalaureate graduates who remain, based on research from the Brookings Institution.⁴⁷

ABOUT QUALITATIVE METHODS

To validate and deepen the quantitative labor market supply/demand analysis, the Council for Adult and Experiential Learning (CAEL) conducted a series of facilitated conversations with representatives from industry, education and workforce development. This process drew upon CAEL's deep experience working with firms and community leaders to address skills shortages and training needs.

Eight focus groups were held at the offices of the Birmingham Business Alliance with another dozen follow up calls during the months of August through October. In total over 125 representatives from business and industry as well as the supply side participated in the process.

SCOPE & PROCESS – Each conversation was approximately 2 ½ hours in length and averaged fifteen participants. CAEL conducted the conversations within the context of three distinct time horizons of workforce demand:

- Short Term – Past 6 Month & Next 6 Months
- Medium Term – 3-5 Years Out
- Long Term – 5-10 Years Out

Each of these time horizons utilized a data point from the quantitative demand analysis as a starting point and then participants were asked to speak to workforce demand, challenges and trends. In the short term time horizon employers were asked to speak to specific jobs and roles that they were looking to fill as well as the mechanics of how they interact with the supply side, i.e. how do they go about finding talent. In the medium term time horizon, industry trends and changes were discussed with an eye towards how those changes will affect the required employee skills and training. Finally, the long term discussion focused on foundation skills as well as emerging technologies that will transform and create the occupations of the future.

PARTICIPANT PROFILES – Each focus group was comprised of industry participants who represented one of three key business functions, senior leadership (Presidents and CEOs), operations (COO and Operations Managers) and human resources (heads of HR and recruiters). The mix of these three functions was critical in ensuring that information could be gathered across the three time horizons with both tactical and strategic perspectives.

Focus group invitations were facilitated through the Birmingham Business Alliance, the University of Alabama at Birmingham, and the United Way of Central Alabama, who reached out to hundreds of firms throughout Greater Birmingham. Special consideration was given to regional diversity in terms of business location as well as diversity in the size of firms was considered.

For the supply side focus group, participants represented the spectrum of education and training providers including, K-12 Career and Technical Education, Community Colleges, traditional four year colleges and universities, workforce investment boards, and education associations.

⁴⁷Rothwell, Jonathan. (2015). What colleges do for local economies: A direct measure based on consumption. <https://www.brookings.edu/research/what-colleges-do-for-local-economies-a-direct-measure-based-on-consumption/>.

THE FOLLOWING IS A LIST OF BUSINESSES AND INSTITUTIONS THAT PROVIDED DIRECT FEEDBACK THROUGHOUT THE PROCESS:

03 Solutions
2b | Photography
Adah International
Alabama Alliance of Boys and Girls Club
Alabama Possible
Alabama Power Company
Alabama State Department of Education
Alacare Home Health & Hospice
Altec
AutoTec
Bayer Properties
BioGX
Birmingham Board of Education
Birmingham Business Alliance
Birmingham City Schools
Birmingham Education Foundation
Birmingham Jefferson Convention Complex
Birmingham Southern College
Blount County Education Foundation
Blue Cross Blue Shield of Alabama
Book-It Legal
Birmingham Startup
Cadence Bank
Cahaba Valley Plumbing
Camisary, Inc.
Central Six Development Council
CGI
Children's Hospital of Alabama
College Admissions Made Possible
Community Foundation of Greater Birmingham
Construction Education Foundation of Alabama
Discovery BioMed Inc.
Dunn Building Co.
E&J Properties
First Commercial Bank
Fortified Learning Solutions
GEAR UP
HealthSouth
Home Instead Senior Care
Homewood Schools
Honda Manufacturing
Hoover City Schools
HXI Machine & Fabrication
Innovate Birmingham
Innovation Depot
Jefferson State Community College
Johnson Management Group
Junior Achievement of Greater Birmingham
KAMTEK
Lawson State Community College
Mayer Electric Supply
Mercedes Benz
Mint Condition Organizing
Moreson Conferencing
O'Neal Steel
Personnel Board of Jefferson County
Planet Fundraiser
Platypi
ProAssurance
Protective Life
Raymond James
Regions Bank
Richgood Gourmet
Samford University
Sarcor
Snelling
Southern Research
St. Vincent's Health System
Startup Grind
Synovus
Teach for America
Tech Birmingham
Teklinks
Teksouth
Ticket Biscuit
United Way of Central Alabama
University of Alabama
University of Alabama Birmingham
University of Montevallo
Walker College Foundation
Watkins Law Firm
Woodlawn Foundation

ABOUT THE AUTHORS

ABOUT BURNING GLASS

Burning Glass Technologies delivers job market analytics that empower employers, workers, and educators to make data-driven decisions. Burning Glass is reshaping how the job market works, with data that identify the skill gaps that keep job seekers and employers apart and tools that enable both sides to bridge that gap and connect more easily. The company's artificial intelligence technology analyzes hundreds of millions of job postings and real-life career transitions to provide insight into labor market patterns. This real-time strategic intelligence offers crucial insights, such as which jobs are most in demand, the specific skills employers need, and the career directions that offer the highest potential for workers.

Burning Glass' applications drive practical solutions and are used across the job market: by educators in aligning programs with the market, by employers and recruiters in filling positions more effectively, and by policy makers in shaping strategic workforce decisions. At the same time, Burning Glass' data-driven applications for workers and students help them choose career goals and build the skills they need to get ahead.

Based in Boston, Burning Glass is playing a growing role in informing the global conversation on education and the workforce, and in creating a job market that works for everyone.

ABOUT CAEL

CAEL is a national non-profit leader in the field of workforce and economic development, providing consulting, research, tools, and strategies needed to create effective talent development solutions. In the last five years alone, CAEL has supported various workforce skill needs and sector specific initiatives in more than 150 communities in 43 states. CAEL brings significant experience working with workforce and economic development practitioners, on-the-ground ability to facilitate employer engagement, analysis of labor market and target sector information, and a national perspective on best practices to align talent development with regional economic clusters. In addition to workforce and economic development, CAEL has built a national reputation as the thought leader in the field of adult education, putting meaningful learning, credentials and work within reach for all.



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**A FRAMEWORK FOR ALIGNING EDUCATION
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