**Subject:** UAB Grand Challenge

**Name of UAB Grand Challenge:** Make Birmingham and Alabama the Best Place to Make Something in America

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Manufacturers in the United States will face a talent shortage in the next decade. Estimates show that there will be 3.5 million job openings for skilled manufacturing jobs in the next decade. However, 2 million of these jobs will not be filled because of the upcoming talent shortage. This will limit the growth of manufacturing and push many of the potential jobs overseas. The problem is complex, but solvable.

According to the National Association of Manufacturers (NAM), in 2015 Alabama had 3,749 manufacturing firms. The reward for solving this problem at a statewide level would be immense since for every job created by a manufacturer, 2.5 jobs are created in local goods and services. The state that best solves this problem will attract manufacturers from across the world. Alabama is already known as a leader in various forms of manufacturing, but the available skilled workforce is becoming depleted even now and very soon may be the limiting factor for Alabama to continue to attract manufacturers to the state.

The ability for a state to support advanced manufacturing will be critical to the success of businesses in the global market. Advanced manufacturing is a broad term referring to the use of technology to improve products and processes. The technology that powers advanced manufacturing includes automation of design, robotics, data driven machines capable of optimizing themselves for maximum efficiency and quality, quality ensuring devices, 3D printing, supply chain automation and many other tools. These tools are what the workforce of tomorrow must be prepared for in order to power a rebirth of manufacturing in the United States.

In order to solve this problem, the first step is to create awareness of the opportunities available to students at an early age. There must be outreach and education at the elementary and middle school level targeting not only the kids, but career counselors and parents as well. The education of young people would benefit if everyone involved had an understanding of the incredible opportunities that are available to the next generation in manufacturing if they prepare themselves to take advantage of them. At the high school level, a recommitment to vocational schools must be established with each county in the State of Alabama being provided with a vocational/technical school that focuses on the needs of tomorrow's workforce. The vocational school should provide for multiple career paths such as skilled workforce training (welding, CNC programming, machining, maintenance of new technologies, PLC programming, robotics,

etc.) that would help prepare the workforce for tomorrow's demands along with engineering and coding as it relates to manufacturing. Before leaving high school, students could be further prepared to meet their goals and the needs of potential employers if an internship was required as part of a high school curriculum. Starting in middle school opportunities for experiential learning must be provided to allow students to begin to determine their preferred career path. At the elementary level, tours of the vocational opportunities and manufacturing facilities should be provided to encourage the imagination and excitement of young people.

Second, we must continue to strengthen the resources available to manufacturers. The majority of the current support structure available in the State of Alabama is to help sustain what manufacturers are doing now. This is a needed service and must be maintained, however, if we are to achieve the goal of making Birmingham and the State of Alabama the leading state for manufacturing, there must be a devotion to educating manufacturers about the emerging technology available to help them improve. Also, there must be an availability of support in implementing these technologies that will make the difference between simply trying to maintain their operation and becoming a world class leader in their area of manufacturing. One opportunity to bolster manufacturing is providing additional support to the small to medium sized manufacturers in identifying automation opportunities that will limit their dependence on a depleted segment of the workforce and lower costs and improve quality of products. This will allow these manufactures to meet the demand of customers and continue to grow.

Finally, the State of Alabama and City of Birmingham could contribute greatly to an influx of new manufactures if they offered tax incentives on top of the added support that we have discussed to new manufacturers during their infancy. A standard package of tax incentives and support should be offered for companies designated as a manufacturer to help them make it past the first two years when it is most likely that a business will fail. The support could include offerings of professional support along with high school level interns that could help support the needs of the company that is developing as well as develop the students' relationships with potential future employers.

In order to tackle the Grand Challenge that will face manufacturers across the state and country it will require a multi-faceted approach and a diverse team as well. A partnership developed between the University of Alabama at Birmingham, The University of Alabama, University of Alabama at Huntsville, two-year college system, Alabama Power and its Technical Application Center, AIDT, ATN, and the Alabama Productivity Center along with the support of manufacturers around the state who would benefit from solving this challenge would provide the tools necessary to meet this need with a coordinated effort.

The workforce problem is a very complex issue, but it is solvable and Alabama can be the state that leads the United State of America in meeting the future needs of manufactures and becomes the model that all other states are chasing. We have the tools, we have the support, but will we accept the challenge?

Let's make Birmingham and Alabama the Best Place to Make Something in America and the World!

**Potential Team Members:**

Alabama Productivity Center Staff: Alan Hill, Tom Morgan, Jody Beck, Jan Ingenrieth, Barika McNeal, Justin Rodgers, Kate Skivjani

Organizations:

University of Alabama

University of Alabama at Birmingham

University of Alabama Huntsville

Alabama Community College System

Alabama Power Company – Technical Applications Center

Alabama Technology Network

AIDT