

## Testimony to the Ohio House 21<sup>st</sup> Century Manufacturing Taskforce

Tim Krueger

Chairman Schuring and members of the committee – my name is Tim Krueger and I am a research assistant with Policy Matters Ohio. Policy Matters is a nonprofit, nonpartisan organization conducting research on issues facing working families in Ohio, and therefore much of our research focuses on improving Ohio's economy for all of its residents. We believe strengthening Ohio's manufacturing base is a key means to achieving this goal, and I thank you for giving me the opportunity to testify today.

Throughout 2010 and 2011, I worked with researchers at Case Western Reserve and Stanford universities to study America's manufacturing networks. We focused mainly on the automotive supply chain, although our findings have implications that reach beyond that industry. America's automotive supply chain is a network of about 8,000 independent firms that produce 70 percent of the parts that go into cars sold in America. A third of the supply chain is located in Ohio, Indiana, and Michigan. Our research on supply chains has been part of a broader initiative in which the Federal Department of Labor funded research teams in Ohio, Michigan, and Indiana to study workforce needs and economic competitiveness throughout the American auto industry. This research, which will inform federal decisions on workforce development policy, has produced a number of reports that can be found at [drivingworkforcechange.org](http://drivingworkforcechange.org).

Working under the direction of Susan Helper, a professor of economics at Case Western who has studied the automotive industry for more than two decades, our supply-chain team has worked hard to understand how the recent recession affected automotive suppliers, how different types of firms compete and remain profitable in this new era, and what these firms' future strategies look like. We took a big-picture approach to our research, asking questions about human resources practices and workforce skills, product development, production techniques, profitability, customer relations, and other areas. We collected data through interviews, plant tours, trade association meetings, and five extensive surveys. All told we spent 14 months collecting in-depth data from over 800 firms, making ours the most comprehensive study of automotive supply chains in over a decade. We then spent eight months analyzing our data and using it to write reports for the U.S. Department of Labor, Case Western, and the Brookings Institution. This testimony is based on our study's findings, with particular focus on issues relevant to this committee's area of interest.

I focus my testimony on three aspects of manufacturing policy. First I will outline the manufacturing strengths of Ohio's different regions. This information may be obvious to some, but will be new to others. Understanding regional strengths is an important first step to crafting

policy suited for Ohio, its regions, and its metropolitan areas. Next, I will touch on why the location of manufacturing matters greatly, and why manufacturing clusters play an important role in sparking innovation. Finally, I will outline basic policy steps the state legislature can take to encourage and strengthen manufacturing clusters, thereby boosting productivity and innovation, increasing Ohio manufacturing's global competitiveness, and making Ohio a more desirable location for manufacturers.

### **Ohio's manufacturing strengths**

Ohio is home to many industries, not just one. Any manufacturing policy should reflect that reality, and all manufacturing policy should start with detailed knowledge and appreciation of the sector's vast diversity. Manufacturing in Ohio differs significantly from manufacturing in many other states, both in product and strategy, and even among Ohio's different regions. While the state legislature should strongly consider certain manufacturing policies, it should do so with an eye toward regional diversity. Policies geared toward certain manufacturing industries will not be equally suited for both northeast Ohio and northwest Ohio, for instance.

Manufacturing, both in Ohio and America, is a predominantly metropolitan activity. In 2010, 79.5 percent of all American manufacturing jobs were located in metropolitan areas. Luckily, Ohio is a very metropolitan state, home to seven of America's 100 largest metropolitan areas (Akron, Cincinnati, Cleveland, Columbus, Dayton, Toledo, and Youngstown). Only Florida and California have more large metropolitan areas.

Not coincidentally, Ohio is home to the third largest number of manufacturing jobs of any state. The vast majority of these jobs – 72 percent – are located in Ohio's eight largest metropolitan areas (the seven listed above plus Canton). Of these metropolitan areas, Cleveland has the most manufacturing jobs by far – it ranks 13<sup>th</sup> among all metropolitan areas in the country for manufacturing jobs.

Yet the composition of industry varies significantly from one metro to the next. Manufacturing in western Ohio, especially along I-75, is specialized in transportation equipment. Metropolitan areas such as Cincinnati, Dayton, Toledo, Springfield, Lima, and Sandusky feed directly into Detroit's automotive supply chain. Significant aerospace clustering exists in Cincinnati, Dayton, Springfield, Lima, and Toledo. Youngstown specializes in automotive manufacturing, along with primary metals and fabricated metals. This clustering approach has worked well for Youngstown in the past few years. Between the last quarter of 2009 and the third quarter of 2011, the number of manufacturing jobs in Youngstown rose nearly 18 percent, meaning that Youngstown led the nation in manufacturing job growth during that period. This increase is at least in part explained by disproportionate job growth among auto-specialized metros during the economic recovery. Most other metropolitan areas demonstrating double-digit growth in manufacturing jobs during that period were largely or somewhat auto-dependent.

Chemical manufacturing forms a second regional base for Ohio manufacturing, mostly in the eastern part of the state. This cluster is based in Cleveland and Akron, but also includes smaller metropolitan areas on the West Virginia border, such as Parkersburg-Marietta, and Wheeling-Martins Ferry. Lima specializes in chemicals as well.

Finally, metropolitan areas in northeast and southwest Ohio are specialized in machinery manufacturing. Cleveland, Akron, Mansfield, Sandusky, Dayton and Springfield form this cluster.

Detailed manufacturing profiles for these metropolitan areas are available at [www.brookings.edu/research/reports/2012/05/09-locating-american-manufacturing-wial](http://www.brookings.edu/research/reports/2012/05/09-locating-american-manufacturing-wial).

### **The importance of clusters**

Overall, Ohio's metropolitan areas are "strongly specialized" in manufacturing, given that manufacturing employment is at least 18 percent higher than its national average in each of Ohio's metros except Columbus.

Manufacturing industries are not randomly dispersed throughout our state or the nation. Rather, firms in a certain industry tend to form clusters, where a city or region's employment in a certain manufacturing industry is at least 5 percent higher than average national employment in that industry. Using this type of measure, employment levels in certain manufacturing industries, it is also possible to label a city or region as specialized, moderately specialized, or strongly specialized in a certain manufacturing industry.

Ohio is also the only state that hosts four of the nation's 20 most manufacturing-specialized metros: Youngstown (8<sup>th</sup>), Toledo (10<sup>th</sup>), Akron (13<sup>th</sup>), and Cleveland (14<sup>th</sup>). Manufacturing is strongly clustered in each of Ohio's metropolitan areas except Columbus.

Clustering matters for a number of reasons. When workers, engineers, and managers live in the same area, they form dense professional networks. These networks facilitate the cross-germination of ideas and strategies, which eventually lead to innovation and productivity improvements. Physical and material advantages, such as the cost-savings achieved by shorter supply chains, are significant factors. Similarly, many industries have unique transportation-related needs that can be best served by ports or specific highways. The advantages of clustering lead to powerful productivity benefits.

Many individuals will spend their careers working for different firms in the same metropolitan area. This is equally true for managers and production workers. Regional skill "pools" form a compelling reason for one firm to locate in a certain place. Movement of workers and managers between firms also furthers the cross-germination of ideas. In order for a firm to remain on the cutting edge of its industry – or, better yet, pioneer an emerging industry – it cannot operate in a vacuum. It cross pollinates by co-locating with similar firms.

For these reasons, clusters promote global competitiveness of American industry. Many clusters have formed on their own throughout history – indeed, this is a main reason urban core cities exist in the first place. Public policy can enhance this tendency to form clusters, and play to our existing strengths. I will next discuss how such policy might be crafted.

### **Cluster-oriented manufacturing policy**

Four main principles should guide any manufacturing policy. First, as I have already discussed, manufacturing policy should be crafted with an awareness of regional diversity of industry composition. During the 1992 presidential campaign, one candidate's economic policy adviser famously stated that it doesn't matter whether Americans are manufacturing computer chips or potato chips, arguing that the distinction should be irrelevant for government policy. Twenty years later we know that this is simply untrue. Just as the needs of America's manufacturing industry differ from the needs of America's banking industry, the needs of food product manufacturing (potato chips) differ from the needs of computer and electronics manufacturing (computer chips). Ohio should not simply adopt manufacturing strategies that have been advanced in other states without critically analyzing the ways in which industrial composition differs from state to state.

Second, instead of only focusing on new specializations, manufacturing policy in Ohio should aim to enhance our existing strengths and build upon existing clusters. We should understand why metropolitan areas in eastern Ohio are specialized in chemical manufacturing or machinery, for example, and promote policies that make the region even more attractive to those industries.

In recent decades, at least six states have made costly efforts to start the "next Silicon Valley," assuming that a regional economy can succeed by ignoring its historical manufacturing strengths and starting a computer and electronics cluster. To date, none of these other states has succeeded in becoming the next Silicon Valley, and the old Silicon Valley is still the only Silicon Valley. There are specific reasons for this. Attempts at starting clusters from scratch usually underestimate the complexity of variables necessary to shift a region's core competencies. As noted above, these variables often have to do with the location of large workforce skills pools, specific geographic amenities such as ports or highways, and the presence of certain universities. History also plays an important role: Silicon Valley developed over a number of decades, not years, and involved billions of dollars of Defense Department spending in the wake of World War II.

This does not mean that we shouldn't seek higher-tech industry. It just means we should better understand existing strengths, build on them, and take a smarter approach to expansion into high-tech industries. Ohio is already home to a number of high-tech manufacturing industries, such as aerospace. Government policy can also enable low-tech and middle-tech industries to become more high-tech. A primary strategy for doing so is to promote policies that encourage R&D and innovation and jumpstart demand for fledgling industries. High-tech industries, as currently measured, are those industries with the highest share of scientists and engineers. If we find ways to encourage existing firms to engage in more R&D and hire more scientists and engineers, Ohio can capture more of the desirable outcomes associated with high-tech manufacturing – greater profitability and competitiveness; higher wages at all skill levels.

Encouraging innovation leads me to my third guiding principle, which is to encourage density and discourage sprawl. As mentioned earlier, significant and measurable advantages in the form of higher productivity and more innovation accrue to firms that locate nearby other firms in the same industry. Economic research shows that these productivity and innovation benefits disappear when a firm moves just one county away from the industry cluster. Thus, we should

not provide financial incentives for firms to locate just anywhere within Ohio. We should encourage them to locate in metropolitan areas near specific clusters. Firms that do so create advantages for one another, allowing the entire network to better compete against same-industry firms in other states and countries.

Good transportation policy can play an important role in enhancing these productivity and innovation advantages. As a general principle, highways tend to encourage sprawl whereas rail tends to encourage density. Manufacturing policy should include shifting highway subsidies to rail. Similarly, state funding should never be used to subsidize industrial movement from a dense area to a less dense area, away from existing clusters.

Finally, the state should not spend money on individual firms, but rather should focus on self-organized clusters of firms that span multiple levels of a supply chain. The state cannot address most barriers to greater efficiency, productivity, innovation, and technological advancement by throwing money at individual firms. Improving Ohio's industry will involve solving inefficiencies and market failures that span multiple levels of a supply chain. For instance, the most cost-effective way to improve the fuel efficiency of a car or small truck is to increase its share of lightweight material. If large first-tier automotive suppliers and the Big 3 U.S. automakers wish to produce cheaper, more fuel-efficient vehicles, many lower tier suppliers will need to invest in new technology and learn how to work with new materials. These investments are often far too complex, costly, and risky for a small supplier to make on its own. Yet the large automakers often lack incentives to help small suppliers with these complicated investments, given that a) doing so is costly, b) much of the return on this investment would accrue to the small supplier, and c) such investment would benefit a large supplier's competitor, as most suppliers have more than one downstream customer. Over time, this misalignment of incentives across multiple levels of the supply chain prevents the whole industry from moving forward. Germany, Japan, and China have developed strategies for overcoming such roadblocks, but U.S. policy lags behind. Instead of spending millions of dollars on individual firms in the form of tax breaks, the state should use that same money to help self-organized clusters of firms at multiple supply chain levels plan and execute complex technology investments that will advance the entire industry. For instance, across the country, local development officials are redeveloping industrial zones into eco-industrial parks where companies have access to shared resources – such as cleaner energy, energy and waste management, and rail corridors. This sort of clustering helps local companies tap into emerging markets for eco-friendly products while increasing energy productivity via energy efficiency, transportation efficiency and innovative waste management strategies. A key concept is that one company's waste may be another company's productive input.

I'll end with an example of effective policy that's happening right here in Ohio at the Swagelok Center for Surface Analysis of Materials at Case Western Reserve University. Swagelok provides an example of an initiative that embodies all of the principles I've discussed. For a fee, the center provides access to expensive materials research equipment that companies and universities would not be able to afford on their own. During the 2008-2009 academic year, 33 different industrial companies, mostly from northeast Ohio, used the facilities. The partnership between business, government, and academia is uniquely suited to advance manufacturing in the region. The same institute probably would not have made sense for Cincinnati, Atlanta, Denver,

or Los Angeles, but it has proven an invaluable resource for manufacturers in northeast Ohio. Because the center is located in an urban area, it encourages centralization. By providing shared access to expensive equipment, the center encourages R&D and allows our existing industries to become more technologically advanced. Finally, the center directs resources towards innovation and competitiveness instead of throwing those resources at firms haphazardly in the form of cash assistance.

In short, Ohio should look for more opportunities to pursue initiatives like the Swagelock Center and some of the other policy recommendations mentioned earlier. Focusing on clusters and enabling technological advancement at multiple levels of the supply chain is the best way to advance Ohio's manufacturing and build long-term economic competitiveness.

*Policy Matters Ohio is a nonprofit, non-partisan research institute  
with offices in Cleveland and Columbus.*