

The background of the entire page is a technical drawing in blue lines on a white background. It features several interlocking gears of various sizes. A large gear is positioned in the center-left, with a smaller gear to its right and another below it. To the right of these, there is a vertical chain of three gears. Dashed lines form a grid and several curved paths, some resembling gear teeth or trajectories. There are also arrows: a vertical one on the left pointing down, a horizontal one at the bottom pointing right, and a diagonal one at the top right pointing towards the center. The text is overlaid on a solid blue horizontal band that spans the width of the page.

INDUSTRIAL RESOURCE CENTER IMPACT ON MANUFACTURING IN RURAL PENNSYLVANIA 2009 - 2016

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Executive Summary

Background

Manufacturing has begun its rebound. Since the beginning of 2010, the industrial sector added nearly 800,000 jobs nationally. Pennsylvania manufacturers contributed over 11,200 jobs to that total – expanding by 2%.

The Pennsylvania Industrial Resource Centers (IRCs) – a network of seven (7) not-for-profit corporations funded in part by the Commonwealth of Pennsylvania and U.S. Department of Commerce – provide small and mid-sized manufacturers with the technical and consultative services they need to grow and create well-paying jobs. By utilizing public support to perform new technology outreach, awareness, assessments and recommendations to the underserved small and mid-sized manufacturer market and transitioning to fee-based engagements for individual client implementations, the IRCs are able to serve manufacturers within both urban and rural communities.

This report evaluates the extent to which IRC efforts within rural Pennsylvania are warranted and the impact of those efforts upon rural manufacturing clients, the communities within which they are located and the Commonwealth.

This document first explores the importance of manufacturing within rural Pennsylvania counties as a proxy for justifying IRC efforts within those regions. The report then uses objectively-obtained data to capture the impact of IRC engagements upon rural manufacturers in terms of job creation and retention, annual payrolls, revenue growth, regional reinvestment and other metrics. IRC engagement impact upon the Commonwealth of Pennsylvania treasury, at least in terms of incremental employee payroll tax collected, is also estimated.

Data Methodology & Approach

Market data was obtained from objective sources such as ESMI, the U.S. Department of Commerce, Dunn & Bradstreet, PA Center for Workforce Information & Analysis, the Center for Rural Pennsylvania and others.

For determining IRC engagement impacts, client-reported data was gathered by the applied research firm Fors Marsh Group and confirmed by the U.S. Department of Commerce. A population of 774 rural IRC clients served between 2009 and 2016 were included in the study, with 632 (82%) fully participating.

Supplemental information, and factors used for calculations, were obtained from the Internal Revenue Service (IRS), PA Treasury Office and/or documents published by those agencies.

Conclusion

Manufacturing is critical to rural Pennsylvania. Within rural communities, manufacturing is the largest sector in terms of total payroll and second (2nd) in total employment. One in seven (7) non-urban workers reports to a manufacturing firm each day. Thus, IRC efforts to reach and engage the Commonwealth's rural manufacturers are well-justified. The fact that nearly 40% of clients utilize the IRC as their only source of technical and consultative services further reinforces this point.

IRC engagements have dynamic impacts upon clients and rural economies. Between late 2009 and mid-2016, IRC clients ascribed the following impacts to their IRC engagements:

- The creation and retention of 13,269 manufacturing jobs;
- The recognition of \$1.3 billion of incremental or retained revenue;
- The realization of \$234.1 in cost savings; and
- The reinvestment of \$312.3 million in expansion, new products, new technologies or other initiatives.

Based upon client-reported job impacts, IRC engagements generated incremental rural manufacturing worker compensation of over \$1 billion in 2016 - \$229.9 million to newly-hired workers and \$799.1 million to workers who would have otherwise lost their manufacturing job. This compensation, in turn, generated an estimated \$22.1 million in incremental Pennsylvania income tax.

The impact of client-reported revenue, cost-saving and reinvestment outcomes, as well as that of indirect or imputed jobs created, upon the Commonwealth treasury was not calculated as part of this report. Such impact, however, is significant, given the high multiplier effect commonly attributed to manufacturing growth.

All data indicates that the IRCs generate a proven return on public stakeholder investments and that further support is justified as a means to accelerate the advancement of manufacturing within Pennsylvania.

Manufacturing continues to drive Pennsylvania’s economy – particularly within rural communities. Across rural Pennsylvania, manufacturing provides more total annual workforce compensation than any other industry and remains the 2nd largest sector in terms of total employment.

Efforts focused on reshoring, creating localized supply chains, leveraging broadband technology and diversifying into new markets are reinvigorating rural Pennsylvania’s manufacturing economy. Additionally, factors such as access to an experienced and dedicated workforce, abundant natural resources, improved infrastructure and lower comparative operating costs are fueling manufacturing growth in Pennsylvania’s non-urban settings.

Since the easing of the 2009 recession, rural manufacturing activity has grown at a fast pace. Several key sub-sectors have already experienced double-digit percentage growth in output and employment.

Since 1988, the Industrial Resource Centers (IRCs) – a network of seven (7) strategically-located not-for-profit corporations designed to provide small and mid-sized manufacturers with the technical and consultative resources they need to maximize performance and create well-paying manufacturing jobs – have served industrial firms in urban and rural Pennsylvania communities. This report explores the extent to which the IRCs have impacted the Commonwealth’s rural manufacturing economy during the period of 2009 through 2016.

Section 1: Rural Pennsylvania’s Manufacturing Economy

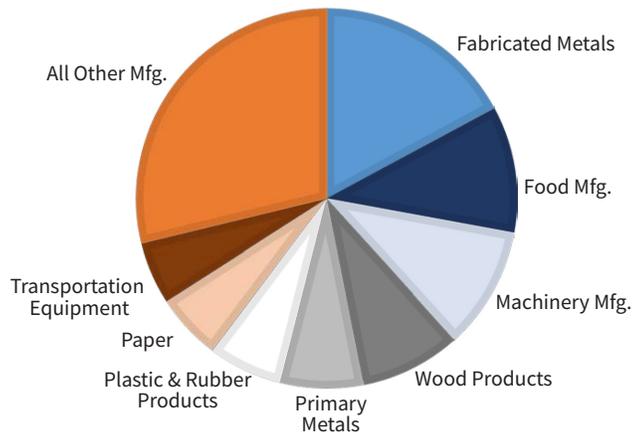
Rural Manufacturing: Composition

Rural Pennsylvania hosts a diverse manufacturing economy, with more than 4,300 firms representing 21 industrial subsectors. While a wide range of manufacturers thrive within the Commonwealth’s rural communities, nearly 70% of rural manufacturing employment is concentrated within eight (8) primary subsectors, as shown on the chart below.

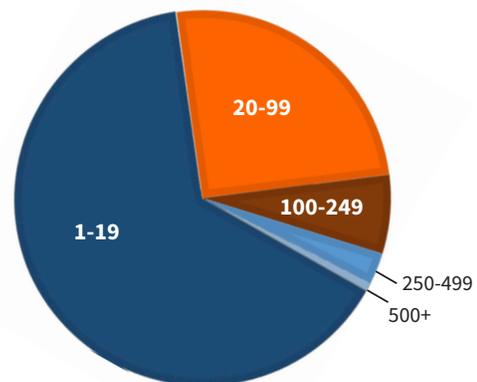
Small and mid-sized manufacturers dominate the Commonwealth’s non-urban landscape, with nearly two-thirds employing fewer than 20 workers and another quarter (25%) hosting between 20 and 99 full-time positions. Only a handful of rural production facilities have 500 or more employees.

Rural Pennsylvania Manufacturing - 2016

By % of Employment

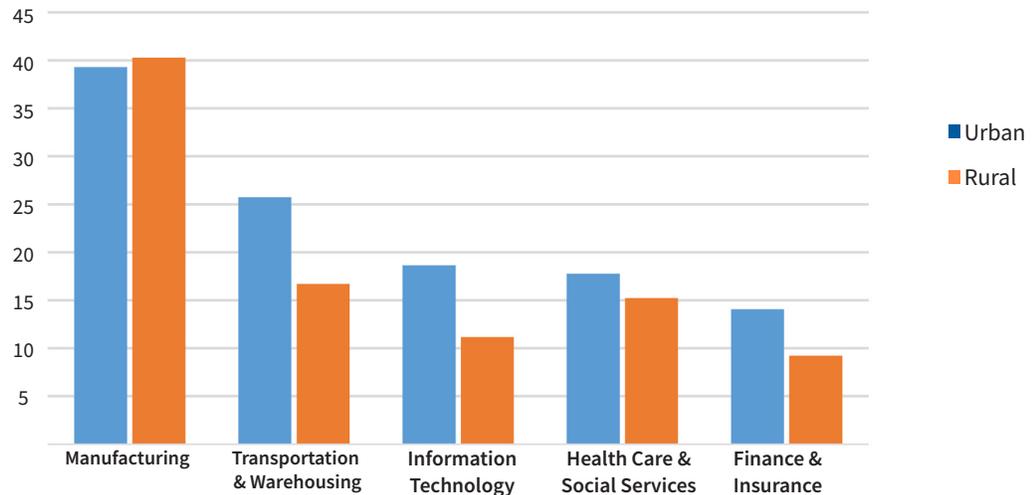


By Number of Employees



Despite the prevalence of smaller manufacturers within rural communities, they mirror their urban counterparts in terms of average firm size. Among all major sectors, in fact, manufacturing is the only industry that scales equally in both rural and urban settings and is not notably “smaller,” in terms of average employment, in non-metropolitan communities. The graph below illustrates the parity of average per-firm employment levels between rural and urban manufacturing enterprises as compared to other selected sectors of Pennsylvania’s economy.

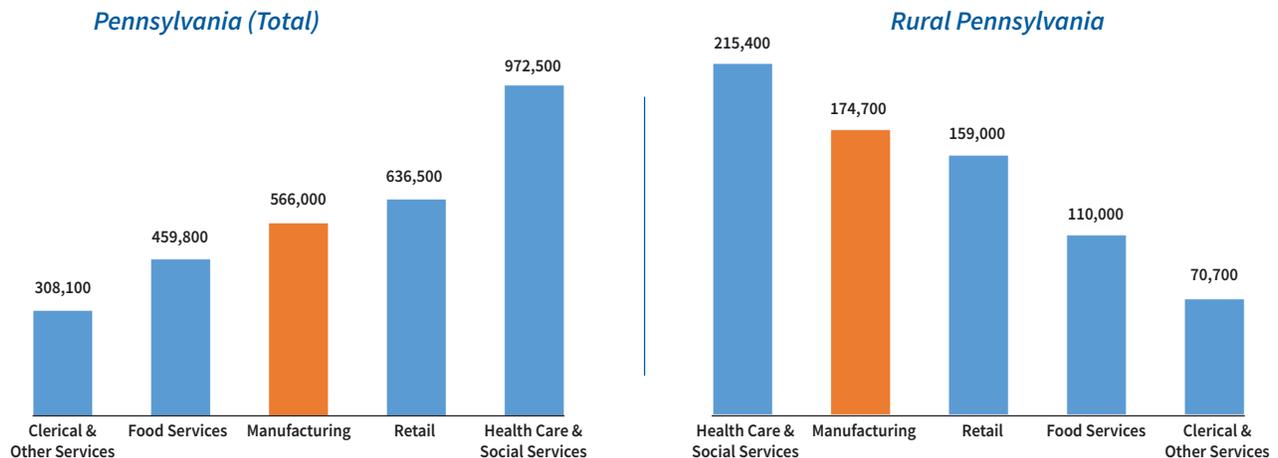
Average # Employees by Sector
Urban & Rural - 2016



Rural Manufacturing: Employment

Across Pennsylvania, manufacturing provides over 566,000 full-time family-sustaining jobs, constituting 11.2% of non-government employment. In so doing, manufacturing remains the Commonwealth’s 3rd largest private sector employer, behind only Health Care & Social Services and Retail. Within Pennsylvania’s rural communities, manufacturing provides 174,700 full-time jobs and stands as the 2nd largest provider of private employment. One in seven (14.7%) workers within Pennsylvania’s rural communities reports to a manufacturing firm each day.

Total Employment by Sector - 2016

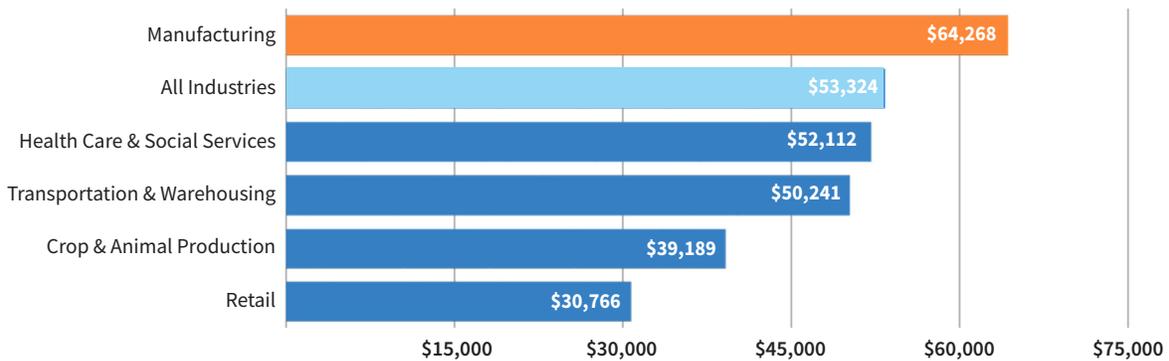


Rural Manufacturing: Employee Compensation

Manufacturing careers provide a high quality of life, job security and financial stability for non-urban Pennsylvanians. Within rural communities, the average manufacturing worker earns \$64,268 of annual compensation and benefits. This surpasses rural Pennsylvania’s overall (all industry) average worker compensation of \$53,324 by 20.52%.

The chart below compares the average compensation provided to Pennsylvania’s rural manufacturing workers to that of other prominent non-urban industries and the overall rural worker average.

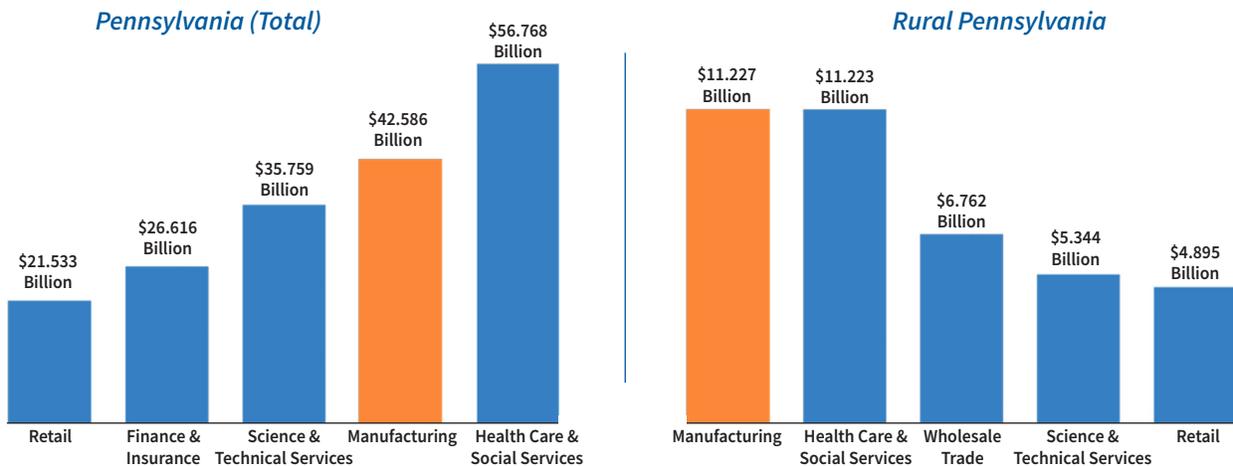
Rural Manufacturer Average Compensation vs. Other Rural Sectors and Overall Rural Average - 2016



Rural Manufacturing: Total Compensation

Given its high level of total employment and above-average annual per-employee earnings, manufacturing remains a dominant provider of total employee compensation, both across the state and, particularly, within rural communities. Overall, manufacturing is the 2nd largest industry in terms of total annual compensation provided to workers. It accounts for \$42.6 billion in compensation each year, or 13.4% of the Commonwealth’s total private industry wages and benefits. Within rural communities, the industrial sector is the largest provider of worker wages and benefits. In 2016, rural manufacturers provided \$11.2 billion of employee wages and related benefits, constituting 17.1% of the Pennsylvania’s non-urban total.

Total Compensation by Sector - 2016



Conclusion

Manufacturing is vital to Pennsylvania's rural economy and citizens. The 4,300-firm industry is concentrated within the Fabricated Metals, Food Manufacturing, Machinery Manufacturing and Wood Products sub-sectors, which together account for nearly 50% of all industrial enterprises. Nearly two-thirds of rural manufacturers host fewer than 20 jobs while less than 10% have more than 100 workers.

In-depth analysis yields some interesting rural manufacturer characteristics, including:

- Manufacturing is the only major sector that scales equally in both rural and urban settings and is not notably smaller in terms of average employment levels.
- Manufacturing is the 2nd largest employment sector in terms of total employment, but largest with respect to total annual worker compensation – largely due to its higher-than-average pay and employee benefits levels.
- In rural communities, the average worker compensation level is 20.5% higher than the overall rural average, far outpacing any other industry.
- Manufacturing accounts for 14.7% of rural Pennsylvania jobs and 17.1% of non-urban workforce compensation.

Section 2: Industrial Resource Center Impact Upon Rural Manufacturers

Determining Industrial Resource Center Engagement Impact

Throughout the period of 2009 through 2016, the U.S. Department of Commerce commissioned the applied research firm of Fors Marsh Group (Arlington, VA) to compile an objective determination of the impact of IRC engagements upon Pennsylvania's rural manufacturers.

To accomplish this, the Fors Marsh Group administered impact surveys inquiring of the direct impact of IRC engagements to rural Pennsylvania clients. Such surveys were conducted 9-12 months following the completion of a client's engagement, thus allowing impacts to be realized, as opposed to projected or anticipated. Client responses were aggregated, analyzed and reported to the U.S. Department of Commerce. On a select basis, the U.S. Department of Commerce directly validated reported impacts to further confirm data accuracy.

Thus, the following data represents an objective and verified summary of IRC impacts upon rural clients surveyed during the mid-2009 through 2016 period.

It should be noted that of 774 clients selected to engage in the Fors Marsh Group study, 632 – or 81.6% – fully participated. Since no extrapolation or projections were made for clients that were unable to complete their surveys, IRC impacts may be understated.

Furthermore, the data below includes only direct IRC engagement impacts and no indirect impacts, which are significant given the high job and investment multiplier effects associated with manufacturer expansion.

A Quick Overview of the Industrial Resource Centers

Since 1988, Pennsylvania's IRCs have been providing the Commonwealth's small and mid-sized manufacturing community with the technology and best manufacturing practice awareness, assessment and implementation services required to remain competitive in national and worldwide markets. Prior to 2011, the IRCs were directly funded through the Commonwealth of Pennsylvania's Department of Community & Economic Development (DCED) with annual allocations of between \$10 million and \$16 million. In 2011, the IRCs became part of the Commonwealth's Partnerships for Regional Economic Performance (PREP) initiative and experienced a reduction in funding to \$5.3 million, annually. The IRCs remain a component of the PREP structure at the time of this report.

IRC state funding is matched with an equivalent amount of federal funding through the U.S. Department of Commerce, as well as fees from private industry for technical services provided to manufacturers. This combined funding allows the network of seven (7) IRCs to cover the entire Commonwealth of Pennsylvania and, therefore, serve manufacturers in both urban and rural communities.

Industrial Resource Center Client Composition

From mid-2009 through mid-2016, the most recent period for which data was available at the time of this report, the IRCs served rural manufacturers with a variety of timely seminars and workshops and performed thousands of no-cost and low-cost business resiliency and performance benchmarking assessments. Also during that period, the IRCs served a total of 774 unique rural manufacturers with at least one substantive engagement aimed at improving efficiencies, reducing operating costs, increasing revenue, accelerating the adoption of new technologies or implementing strategy-level changes to their business models.

The distribution of IRC clients across the range of industrial subsectors generally reflects the overall composition of Pennsylvania’s rural manufacturing economy, with the exception of Food Manufacturing, which requires very specialized expertise.

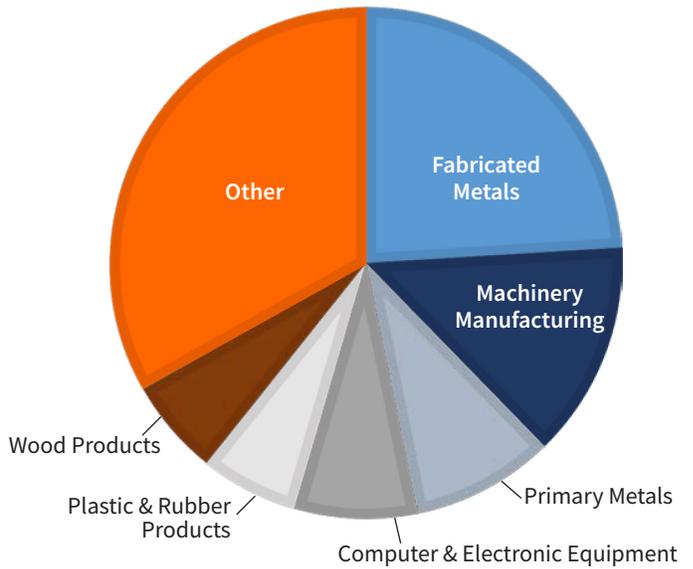
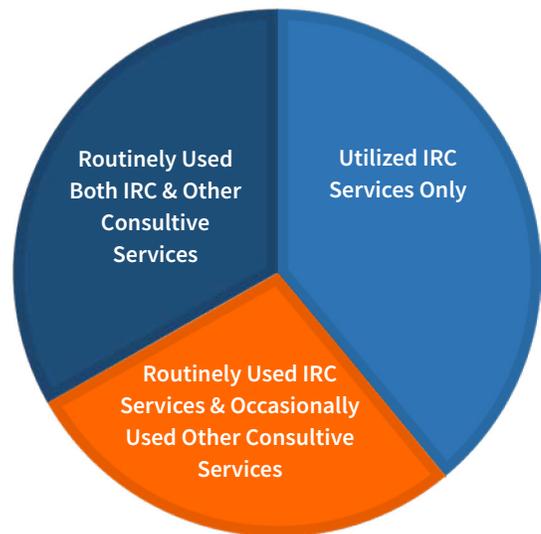


Chart Represents 774 Clients

Manufacturer Reliance Upon Industrial Resource Center Services

As part of their analysis of IRC impact upon rural Pennsylvania manufacturers, the Fors Marsh Group asked IRC clients if their regional IRC was the only technical assistance and consulting resource they utilized during the period of 2009 through 2016 or, conversely, if they used alternative providers as well and, if so, how frequently.

Of the 632 rural IRC clients that participated in the study, 615 provided a response to this particular question. Of that population, 240 – or 39.0% – indicated that throughout the entire span of 2009 through 2016, their regional IRC was the only resource they used for technical and consultive services. Another 183 – or 27.8% – responded that their IRC was the only resource they utilized in some years, while in others they used both their IRC and additional providers. Only 192 rural companies – or 33.2% – stated that they used their IRC and other providers resources routinely throughout the period.



Direct Job, Regional Workforce & State Treasury Impacts

As part of their impact-gathering process, the Fors Marsh Group asked IRC clients to quantify the jobs created solely by virtue of their IRC engagement(s). Clients were similarly asked to quantify the number of jobs that, in the absence of the results of those IRC engagement(s), would have been eliminated. This collection of job creation and job retention outcomes best captures the direct regional workforce impact of IRC activities.

Overall, clients ascribed significant levels of job growth and job retention to their IRC engagements. In total, manufacturers across 18 of 21 industrial subsectors directly attributed the creation of **2,956 new manufacturing jobs** and retention of **10,313 existing full-time jobs**, which would have otherwise been lost, to their IRC engagements. Subsector reporting of job creation and retention impacts are summarized in the chart below.

IRC Engagement Job Impacts, 2009 - 2016			
Subsector	Jobs Created*	Jobs Retained*	Total Jobs Impact
Fabricated Metals	814	3,541	4,355
Transportation Equipment	290	1,499	1,789
Machinery Manufacturing	512	891	1,403
Plastic & Rubber Products	306	927	1,233
Primary Metals	345	755	1,100
Wood Products	76	522	598
Computer & Electronic Equipment	145	384	529
Electrical Products	96	163	259
All Other Sectors	372	1,631	2,003
Total	2,956	10,313	13,269

* Verified, Fors Marsh Group

Based upon the manufacturing subsector in which the above jobs were created or retained and the counties within which they are situated, IRC engagements are directly responsible for the addition of an estimated **\$229.9 million** in rural manufacturing employee compensation in 2016 and the retention of an estimated **\$799.1 million** in employee compensation throughout 2016. The total 2016 direct workforce compensation impact attributed to IRC engagements with rural manufacturers generated an estimated **\$22.1 million of additional income tax** revenue for the Commonwealth of Pennsylvania that year. The table below summarizes these impacts.

IRC Engagement Regional Employee Compensation & Treasury Impacts	
Creation of New Jobs (Verified, Fors Marsh Group), 2009 - 2016	2,956
Retention of Jobs Otherwise Lost (Verified, Fors Marsh Group), 2009 - 2016	10,313
Total Job Impacts (Verified, Fors Marsh Group), 2009-2016	13,269
Annual Rural Manufacturing Employee Compensation Generated From Job Creation, 2016 (Est.)	\$229,933,544
Annual Rural Manufacturing Employee Compensation (Est.) Preserved Due To Job Retention, 2016 (Est.)	\$799,080,349
Total Annual Rural Manufacturing Employee Compensation Impact, 2016 (Est.)	\$1,029,013,893
State Income Tax Paid on Additional/Retained Employee Earnings, 2016 (Est.)	\$22,113,508

State Income Tax impact calculated as total compensation x 70% (wage component vs. benefit component) x 3.07% tax rate.

Client Revenue & Cost Savings Impact

In addition to determining the job-related impacts of IRC engagements, the Fors Marsh Group ascertained, by way of the same objective process, other rural manufacturer impacts directly assigned to IRC projects, including revenue impacts.

To determine project-related revenue impacts, the Fors Marsh Group asked rural clients to quantify IRC project impact in both new and retained sales categories. New sales would be those originating from increased capacity, achievement of a new industry certification (ISO 9001), successful entry into new markets, attraction of new customers, launch of new products and other factors – all of which were made possible by their local IRC. Retained sales was defined as those that, in the absence of the client’s IRC engagement, would have been lost due to client customer demands for increased quality, improved lead times, product customization or other price, performance or product requirements.

According to data provided by rural clients, IRC engagements performed from mid-2009 through the second (2nd) quarter of 2016 directly generated the following revenue-related impacts:

IRC Engagement Rural Client Revenue Impacts, 2009 - 2016	
New Sales Impact	\$331,242,792
Retained Sales Impact	\$972,264,616
Total Sales (Revenue) Impact	\$1,304,507,408

Rural IRC clients were also asked to identify bottom-line cost savings directly traceable to IRC engagements performed during the same period. Common sources of cost savings would be improved raw material, natural resource or energy efficiencies, enhanced per-employee productivity levels, reduced scrap, rework or waste, the application of updated technology, or improved overall competitiveness.

Based upon information provided directly from rural clients, IRC services rendered during the period of mid-2009 through the second (2nd) quarter of 2016 yielded **\$234,068,931** of total operating cost savings. These savings increased firm profitability and, in turn, facilitated reinvestment back into the business, as noted within the Regional Investment Impacts section that follows.

Regional Manufacturer Reinvestment Impacts

The Fors Marsh Group asked rural IRC clients to quantify regional investments made possible by the revenue impact, cost impact or job impact of their IRC engagements. Clients were encouraged to categorize such investments into a number of categories, including Property, Plant & Equipment, Information Technology, Workforce Skills and others.

In total, IRC non-urban clients credited regional investments of **\$312,295,976** to IRC engagements performed within the period studied. As expected, investments in the traditional expansion category of Property, Plant & Equipment were most significant. Investments in New Products & Processes, which include costs associated with research and development (R&D), additive manufacturing (3D Printing), prototyping and the exploration of advanced materials, were particularly impressive, amounting to nearly \$72 million, or 23% of the total reported.

IRC Engagement Rural Client Reinvestment Impacts, 2009 - 2016	
Traditional Expansion (Property, Plant & Equipment)	\$184,623,981
Investments in New Products & Processes	\$71,558,583
Investments in Information Technology	\$18,624,198
Investments in Workforce Skills	\$18,565,822
Investments in All Other Categories	\$18,923,392
Total Investments	\$312,295,976

Conclusion

The statewide IRCs play a pivotal role in enhancing and maximizing the competitiveness, long-term sustainability and job-providing resilience of rural Pennsylvania manufacturers. Collectively, they avail small and mid-sized rural enterprises to techniques, technologies and new revenue opportunities that they otherwise would not be aware of or implement, thus directly stimulating manufacturer reinvestment, expansion and job creation. Data gathered by an independent third-party and subsequently verified by the U.S. Department of Commerce proves that IRC engagements provide a positive return on state and federal resources invested.

During the period of mid-2009 through mid-2016, 774 different rural Pennsylvania manufacturing firms turned to their regional IRC for technical and consultative services to address a business need or capitalize on a growth opportunity. The Fors Marsh Group – an applied research firm based in Arlington, Virginia – recently released post-engagement impact data voluntarily reported by 632 of those companies as part of an ongoing study commissioned by the U.S. Department of Commerce. This data confirms that:

- Nearly **40% of respondents stated that their IRC was the only technical and consultative resource** they utilized during the 2009-2016 timeframe.
- Clients within **18 different manufacturing subsectors reported job creation and retention** as direct impacts of their IRC engagements.
- **A total of 13,269 rural Pennsylvania manufacturing jobs were created and retained** as direct results of IRC engagements.
 - Those jobs generated an estimated **\$1.02 billion in total rural employee compensation in 2016** alone.
 - Those jobs generated an estimated **\$22.1 million in Pennsylvania state income tax revenue in 2016**.
- Rural clients reported **\$1.3 billion in revenue impact and \$234.1 million in cost savings** as direct outcomes of their IRC engagements.
- Business impact from **IRC engagements facilitated \$312.3 million in rural client reinvestment** in expansion, new technologies, new products and other areas.

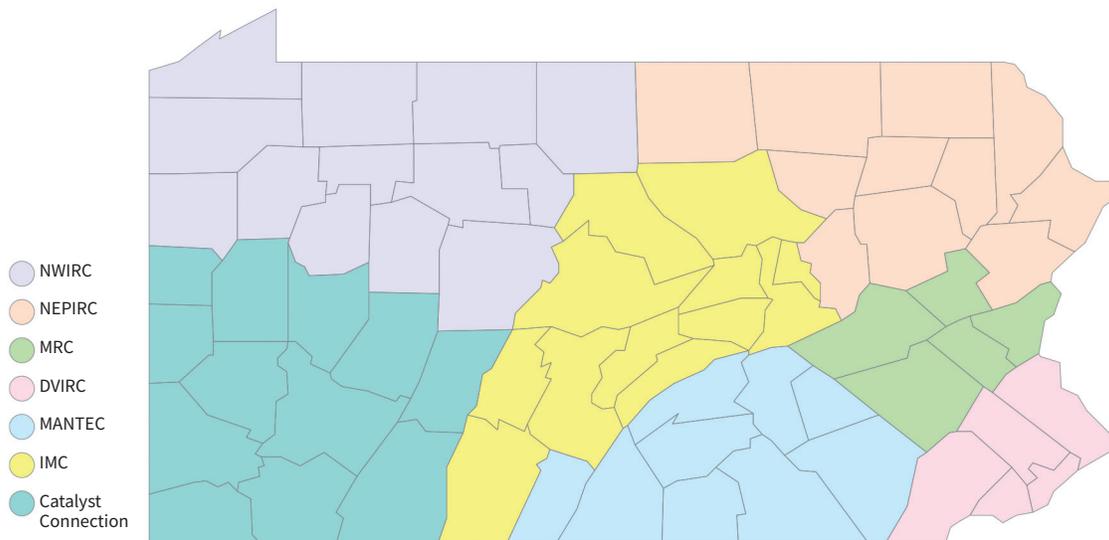
As manufacturing continues its resurgence across Pennsylvania and the nation, the IRCs will become even more essential to firms in rural communities. As their primary, and in many cases only, consultative resource, rural manufacturers will turn to their IRC for advisement in the areas of additive manufacturing, cybersecurity, Industry 4.0, supply chain optimization and innovation, as well as continued expertise in Lean Enterprise, Six Sigma, quality systems and other areas.

The IRCs generate a proven return on all stakeholder investments – both public and private – and merit additional resources to further the Commonwealth of Pennsylvania and national strategy of bolstering domestic manufacturing output and accelerating the creation of well-paying manufacturing jobs.

Sources: PA Department of Labor & Industry; PA Center for Workforce Information & Analysis; Center for Rural Pennsylvania; EMSI (2016 Q4 Data); U.S. Census Bureau; U.S. Bureau of Labor Statistics.

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Pennsylvania IRC Network



Fors Marsh Group

The Fors Marsh Group is an applied research company that helps organizations and governments make research-backed decisions that positively affect the citizens they serve. Their expertise in survey design and administration, research and analysis, and data evaluation enable them provide the insight necessary for governments to make prudent evidence-based decisions.



Biography

Eric Joseph Esoda is the President & CEO of the Northeastern Pennsylvania Industrial Resource Center and President of the Pennsylvania IRC Network, Inc.

Mr. Esoda serves on the Board of Directors of the Pennsylvania Economic Development Association (PEDA) and is pursuing Certified Economic Developer (CecD) designation from the International Economic Development Council (IEDC).

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