Economic Impact Assessment
Naval Support Activity (NSA) Crane

A Report to the Team Crane Community Planning and Liaison Working Group and the Indiana Office of Defense Department (IODD)

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A report to the Team Crane Community Planning and Liaison Working Group and the Indiana Office of Defense Department (IODD) from:

Lisa Abbott
Lucas Anderson
Liza Bartlett
Sean Benolken
Cydnee Cruz
Benjamin Eagles
Mackenzie Higgins
Michael Large
Giang Le
Sangho Lee
Katherine Rouch
Mattie Theobald
Joseph Thurston
Samantha Tirey
Thu Vu
Matthew Wolf

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Executive Summary

This report is an analysis of the economic impact of Naval Support Activity Crane (NSA) on the South West Central region in Indiana. It is a follow up to the *Impact Assessment Crane Division of the Naval Surface Warfare Center, Naval Sea Systems Command* written by Thayr Richey, Shari Woodbury, and David Audretsch in December 2000. Crane is directly and indirectly responsible for thousands of jobs in Indiana, and millions of dollars in wages associated with those jobs. It also contributes substantial tax revenues to state and local communities and provides the area with a variety of services. In order to evaluate all their effects on the region, this report is broken down into six main analysis categories. They are current impact, community impact, education impact, technological leadership, environmental leadership and next steps.

Current Impact

This section covered the impact of direct taxation, indirect taxation, and Crane's contracts on the local economy. This section also makes recommendations for more efficient economic impact tracking. NSA Crane's has a small effect on the economy through direct taxation, Martin and Lawrence County receive payments in lieu of taxes that makes ups a minor part of their operating budgets. Indirect taxation tremendously impacts the local economy. Crane NSA indirectly contributes $5.48 million in property taxes, $4.52 million in sales taxes, and $6.87 million in income taxes for an indirect impact for the state of Indiana of $30.37 million.

Community Impact

Naval Support Activity Crane had a direct impact on Indiana's economy through the salaries they pay their employees as well as an indirect impact through the housing that their workforce requires. NSA Crane is the largest employer in Martin County and the second largest employer in the State of Indiana. Since a major of their workforce commutes to work, the housing markets in Lawrence, Orange, Monroe, Martin Daviess and Greene Counties are affected. The naval base also encourages its employees to be involved in a number of community outreach a volunteer programs.

Education Impact

One of NSA Crane's goal is to encourage local residents to obtain higher educational attainment in order to cultivate their own workforce. 63% of Crane's employs have a bachelor's degree or higher with a jobs requiring a degree being in the STEM field. There have been partnerships with local universities and K-12 schools to create more STEM introductions to the younger population in the region. This section also analyzes the graduation rates and college enrollment trends for each county. Finally, this report offers recruiting strategies for attracting employees from southern Indiana, specifically what colleges are the best to find new employees.

Technological Leadership

NSA Crane firmly establishes its position for technological research, development, and leadership in the region. One of the largest impacts on the technology market is through technology transfer (T2) agreement. Our analysis shows that for every T2 agreement, three jobs are created which leads to $614,000 in generated taxes. With 157 completed T2 agreements, NSA Crane has created 138 new jobs and $28 million in taxes. NSA Crane has also focused a lot of their resources on maintaining a healthy relationship with WestGate, a technology park that houses about 40 tenants that regularly does business with NSA Crane.

Environmental Leadership

NSA Crane is a leader in Southern Indiana in natural resources management, green practices, and outdoor recreation including fishing, hunting, and boating. NSA Crane is located on 54,000 acres of forest, and thus the counties that house NSA Crane have benefited from logging. In the past 5 years, Martin, Greene, and Lawrence have collectively received $795,085 in direct economic impact through timber sales. Finally, the naval base encourages renewable energy practices and has recently partnered with Duke Energy to set up 76,000 solar panels, in order to become more energy independent.

Next Steps

This final section offers 4 categories of recommendations to NSA Crane in order to not only maintain their economic impact but also grow in areas that need improvement. First, using location quotient analysis, we analyze the effects of university spillover and the importance of partnering with logistics and trucking companies to leverage I69. Next, the second part is a cluster based analysis for each county and then we suggest what industries NSA Crane should their invest resources in. The third part will analyze potential ways for Crane to improving new technologies especially with product license agreements. Finally we discuss alternative solutions to improve human capital including implementing a human capital database.

Current Impact

Introduction

The objective of this section is to determine the current economic impact of Crane Naval Base on Southeastern Indiana. In order to measure this impact, there were three factors which were measured. The first factor is direct taxation, which analyzes the impact of payments in lieu of taxes made by the Federal government to local taxing entities. The second factor is indirect taxation, which analyzes the impact of property, sales, and income taxes by Crane employees on local taxing entities. The final factor analyzes the impact of Crane contracts on the local economy. Finally, we make recommendations on ways Crane can track their economic impact in a more efficient manner.

Methodology

To quantify the economic and fiscal impacts of Crane, an input/output model would best measure these influences. This model would enumerate the employment and fiscal impact of each dollar earned and spent by the following: employees of Crane, tenants on Crane, Crane contractors, and other supporting vendors (business services, retail, etc.), each dollar spent by these vendors on other firms, and each dollar spent by the households of the installation's employees, other vendors' employees, and other businesses' employees.

"Economists measure three types of economic impacts: direct, indirect, and induced impacts. The direct economic effects are generated as businesses create jobs and hire workers to fill new positions. The indirect economic impacts occur as firms purchase goods and services from other firms. In either case, the increases in employment generate an increase in household income, as new job opportunities are created and income levels rise. This drives the induced economic impacts that result from households increasing their purchases at local businesses."[1]

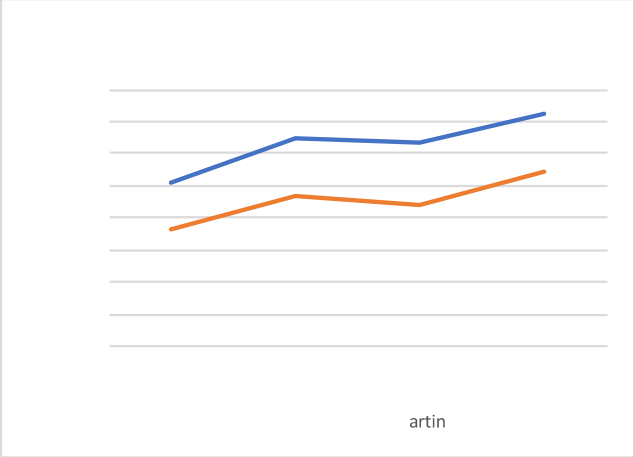
Taxes associated with NSA Crane are one aspect of the economic impact of Crane for the state of Indiana. There are two forms of taxes: direct and indirect. Direct taxation is calculated as the amount NSA Crane pays directly to the government in the form of taxes. As NSA Crane is property of the Federal Government, they are exempt from this type of taxation. However, there are ways in which entities such as NSA Crane can offset these losses, which will be discussed below. Despite Crane being largely exempt from direct taxes, they are not exempt from indirect forms of taxation. Crane's employees pay taxes on the wages they receive from Crane.

[1]Irani, D., & Grimm, J. (2015). Maryland Economic Impact Study of Military Facilities. *Maryland Department of Business and Economic Development*. Retrieved from http://commerce.maryland.gov/Documents/ResearchDocument/MarylandMilitaryInstallationEconomicImpactStudy2015.pdf

Direct Tax Impact

Although Crane property is exempt from direct property tax payments to state or local entities, they are still required to make payments to local jurisdictions where Crane is located. As stated in Chapter 69, Title 31 of the United States Code, requires Federal payments, "payments in lieu of taxes (PILOT)," to local governments that help offset the lost revenue due to non-taxable Federal lands2. PILOTs are calculated using a formula based on population, receipt sharing payments, and the amount of land within an affected county. NSA Crane is located on 13,379 acres in Lawrence County, and 7,881 acres in Martin County. PILOTs averaged $12,500 to Lawrence County and $9,000 to Martin County from 2013 to 2016.[3]

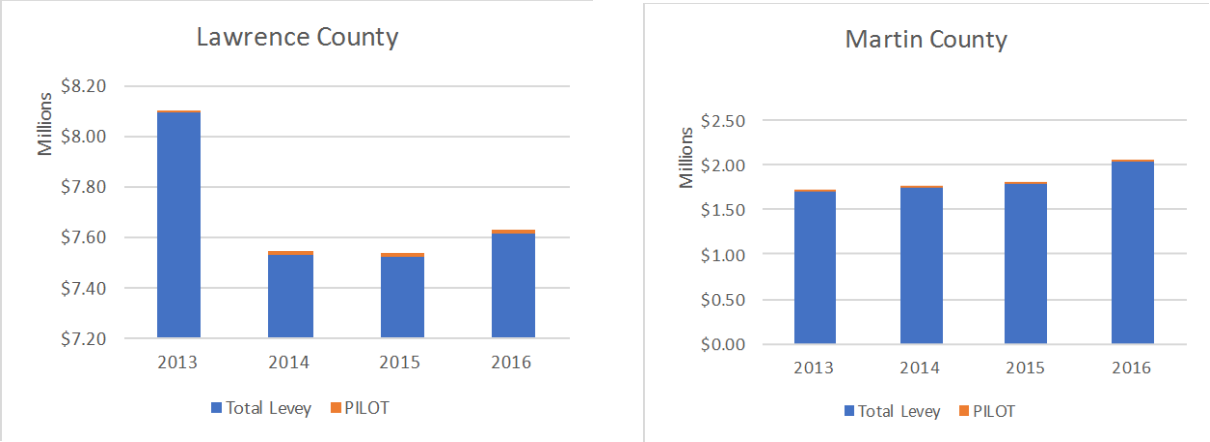
Figure 1. Annual PILOT Payments in Lawrence and Martin County



As can be seen by Figure 1, these payments have steadily increased over the last four years. Although payments are increasing, Figure 2 shows these payments result in less than one percent of the certified property tax levy for each of the counties.[4]

[2] U.S. Department of the Interior: Payment in Lieu of Taxes. (n.d.). Retrieved from https://www.doi.gov/pilt
[3] U.S. Department of the Interior. (n.d.). *Fiscal Year 2016 Payments in Lieu of Taxes*. Retrieved from https://www.doi.gov/pilt/resources/annual-reports
[4] Department of Local Government Finance. (n.d.). Retrieved from http://www.in.gov/dlgf/2339.htm

Figure 2. PILOT compared to Total Levy



As we will show, although there is a limited direct impact of PILOT payments on the operating budgets of Lawrence and Martin County, the indirect impacts of NSA Crane are much greater.

Indirect Tax Impact

Crane NSA employs 3,300 employees across 18 counties. A majority of these jobs, 97.9%, are held by civilians, with the remaining 2.1% held by members of the military. These employees all pay taxes to the state of Indiana. As taxes are used for a variety of beneficial purposes, these contributions are vital for the state of Indiana. This analysis will focus on three types of taxation paid by Crane's employees: property tax, sales tax, and income tax. In this analysis we will be using a multiplier. The multiplier effect for Crane NSA is the additional economic impact created as a result of Crane's indirect taxes paid. The multiplier used in this analysis was derived from an input-output model and Social Accounting format calculated by Tripp Umbach for "Innovate Indiana."[5] Our analysis finds the Crane NSA indirectly contributes $5.48 million in property taxes, $4.52 million in sales taxes, and $6.87 million in income taxes for an indirect impact for the state of Indiana of $30.37 million.

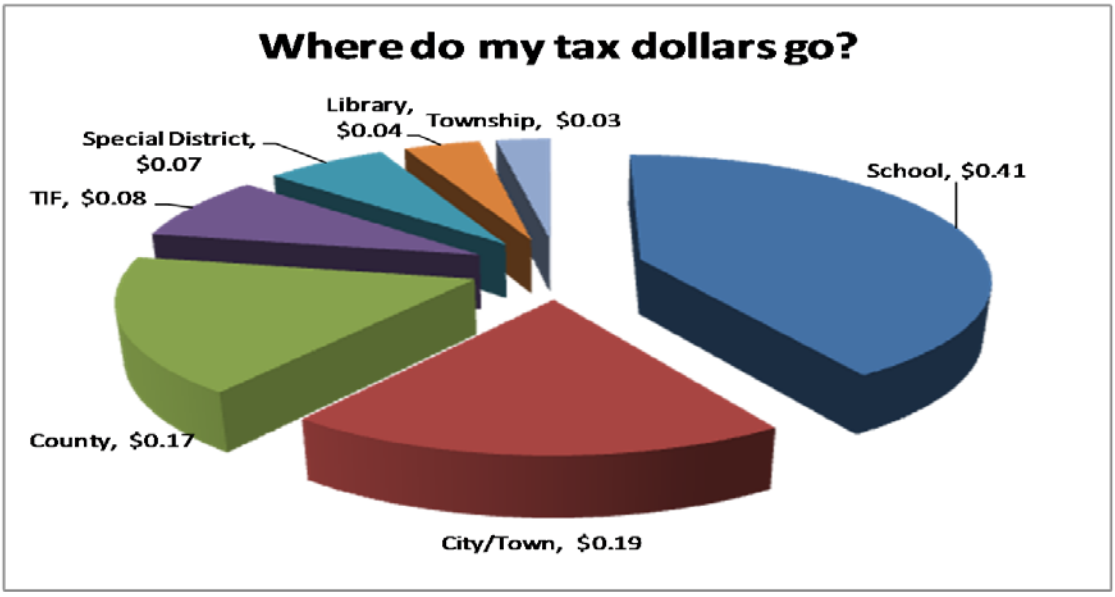
Property Taxes

Property taxes are taxes raised from owning real estate and land—and are one of the most important taxes raised by states due to their stability. According to the Indiana governmental website they are used for a variety of services such as "welfare; police and fire; new construction and maintenance of buildings; local infrastructure like highways, roads and streets; and the operations, including salaries of the local units of government."[6] In 2013 Indiana spent 41% of property taxes on education, 19% went to cities, and 17% went to counties.

[5](2012). Economic Engine for Indiana: An Economic Impact Analysis. *Tripp Umbach.* http://innovateindiana.iu.edu/docs/economic_impact_study.pdf

[6] Citizen's Guide to Property Tax. Indiana Department of Local Government Finance. http://www.in.gov/dlgf/2516.htm

Figure 3. Indiana Property Tax Dollar Distribution

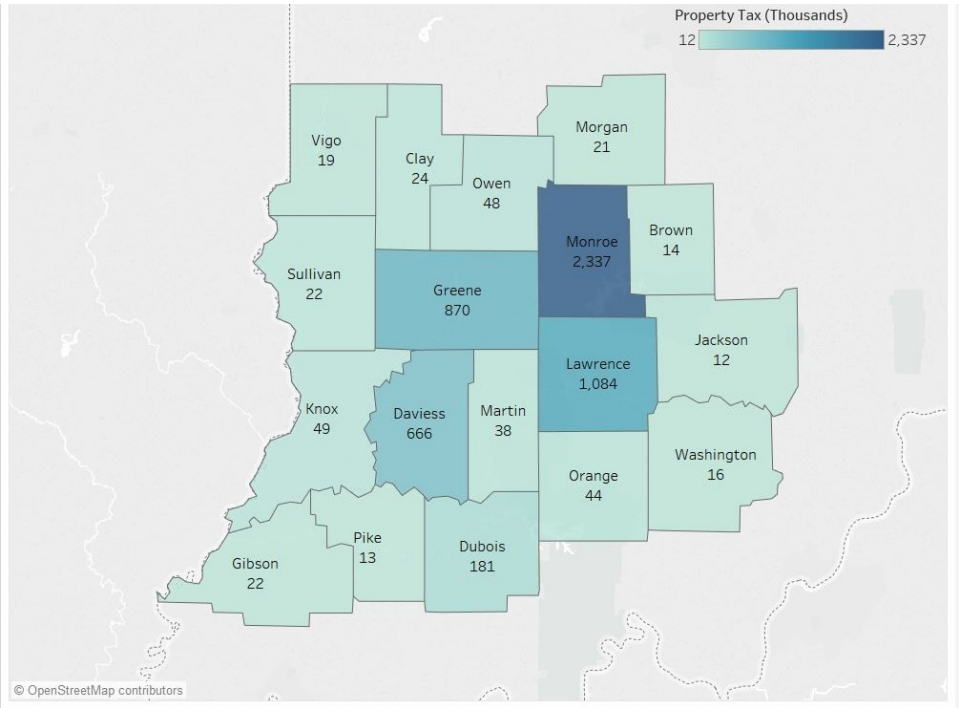


Crane NSA's employees paid an estimated $5.48 million in property tax payments , which resulted in an impact of $9.86 million. Property taxes are an important source of revenue for state governments, especially for education. Indiana went from using a true tax value to a market based value in 2002. The median property tax collected in 2015 for each county was collected from *STATSIndiana*.[7] Home values were estimated using Zillow Home Value Indexes from 2015. Zillow Home Value Indexes are an estimate of the current median market value for homes in a given geographic area. The tax bill for a given property is equal to the rate multiplied by the net assessed value. By taking into account the median property tax rate in a county, given the number of employees residing in that county, an estimate of how much was paid in each county was calculated and is presented below. It is important to note that our calculations appear to assume all employees own homes. While it is true that renters do not directly pay property taxes, their rentals are taxed. Therefore, we assume that the state is receiving property tax payments from their landlords. Members of the military residing in Martin County were not taken into account, as military members on base do not pay property taxes

As shown in Figure 4 largest impact came from four counties in particular—Monroe, Lawrence, Greene and Daviess. The average median county property tax rate in 2015 ranged from 1.03% in Brown County to 2.75% in Crawford County. The average amount paid on properties ranged from $1,025 in Martin County to $2,474 in Monroe County. These assessments fall within expected bounds as per the Indiana Department of Local Government Finance Website.

[7] Property Tax Rates by County. STATSINDIANA. http://www.stats.indiana.edu/dms4/propertytaxes.asp.

Figure 4. Property Taxes by County

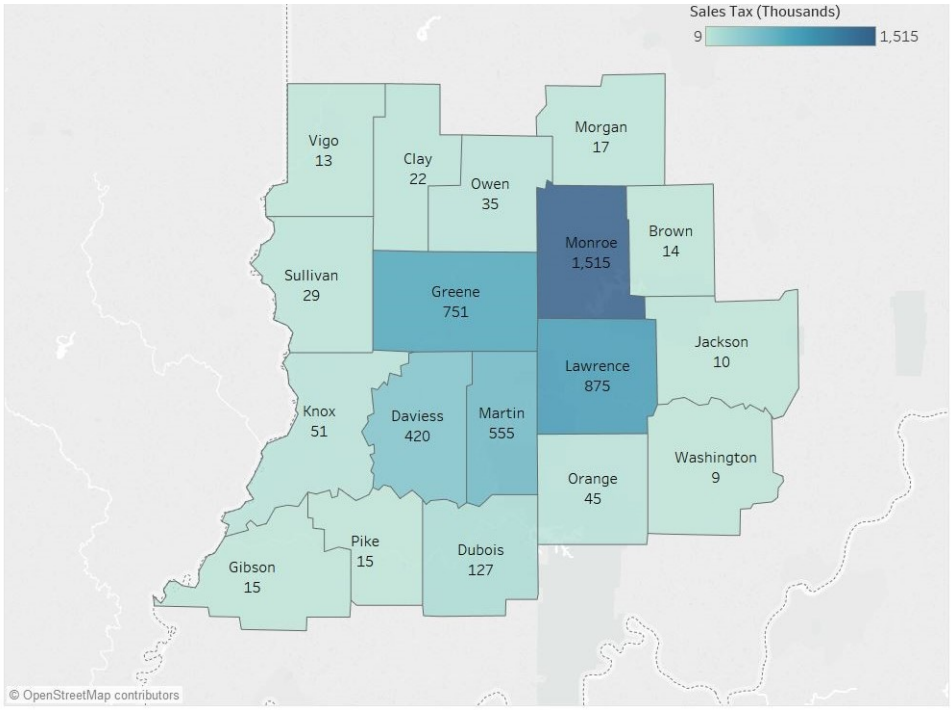


Sales Taxes

Sales taxes are collected on the sale of goods and services. The State of Indiana does not collect county or city sales tax, but instead only levies a 7% state general tax. According to the latest Census Bureau Consumer Expenditure Survey, people in the medium income range spend about 31% of their income on taxable goods. This figure was used to estimate the amount of sales tax paid by Crane employees. We estimate Crane NSA's employees paid an estimated $4.52 million in sales tax payments for an impact of $8.13 million.

As with property taxes, Monroe County, Lawrence County, Greene County, and Daviess County have four of the five largest impacts. However, Martin County has a similarly large effect. This is partially due to the members of the military residing in Martin County on base who pay sales tax, but are exempt from property taxes.

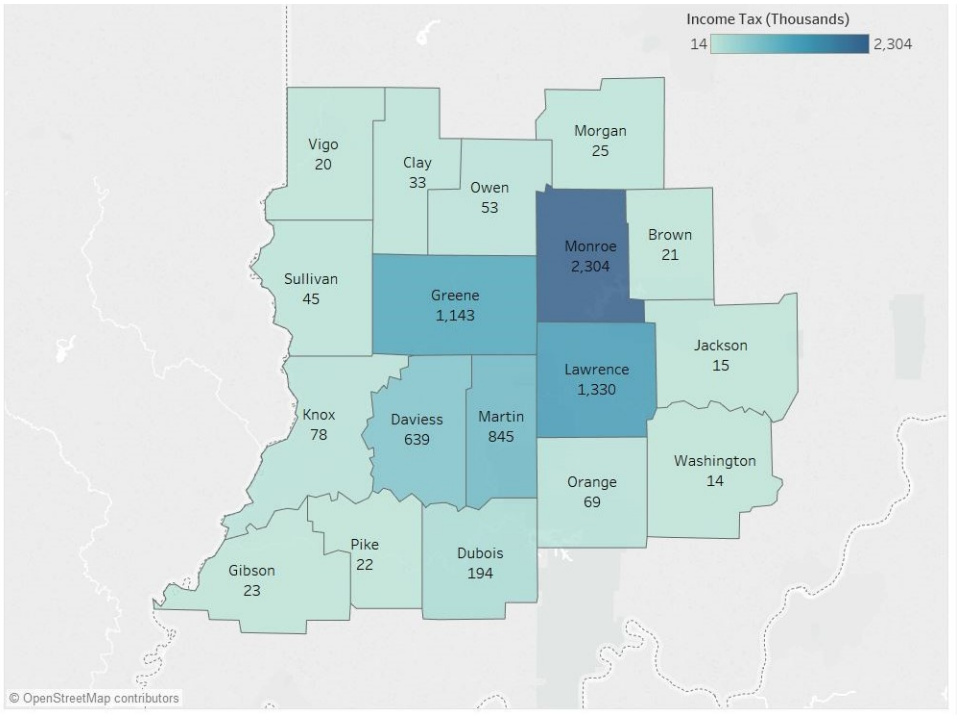
Figure 5. Sales Taxes by County



Income Taxes

Income taxes are taxes levied on revenue taxes, individual income tax yields are considerably greater. Income taxes are primarly Federal, but states also levy them. Income tax estimations are very straightforward in the state of Indiana as Indiana leveies a flat 3.3% income tax. The trend with income taxes are similar to sales taxes—with the largest impacts coming from Monroe, Laurence, Greene, Martin and Daviess Counties. Crane NSA's employees paid an estimated $6.8 million in income tax payments with an impact of $12.36 million.

Figure 6. Income Taxes by County



Contracts

A variety of contractors support NSA Crane's operations in southern Indiana. Using publicly available data, a total of 917 contracts greater than $3,000 were obligated behalf of Crane in FY 2015 in the state of Indiana. These awards totaled $76,468,095.[8] Please see the appendix for these figures.

Recommendations

In order to monitor the continual economic impact of Crane Naval Base, we recommend using the attached sheet (see footnote). This form was discovered in a 2014 East Tennessee Military Council report[9]. While this form is rather rudimentary, it will enable Crane Naval Base to monitor its relative economic impact of the region rather quickly as opposed to the in-depth method of study and research we have done here today.

[8] Data retrieved from USAspending.gov

[9] East Tennessee Military Affairs Council. (2014, April). *Military Economic Impact Analysis for East Tennessee.* Retrieved from https://www.etmac.org/wp-content/uploads/2014_04_Economic_Impact_Report_2014_03_26_.pdf

Community Impact

Naval Support Activity Crane is the largest employer in Martin County and the second largest employer in the State of Indiana. NSA Crane employs approximately 3,300 military, government, and contractor employees who reside in 19 counties in Indiana and took home earnings estimated at $208,224,759 in (year) with an average wage of $63,095.54. The communities surrounding NSA Crane benefit through the higher than state average jobs, NSA Crane direct spending, spending by the employees in the study area, and the taxes generated from those activities. Figure 7 outlines the county profiles looking at population, per capita income, median income and free & reduced lunch.

Figure 7. County Population Profile

County Profiles[10]					
County	**Population**	**% of Change 2010-2015**	**Per Capita Income (2015)**	**Median Household Income (2015)**	**Free & Reduced Lunch Recipients (2016)**
Crawford	10,486	-2.10%	$32,287	$41,331	967
Daviess	32,969	4.20%	$38,167	$47,019	2,405
Dubois	42,461	1.40%	$50,943	$57,336	2,439
Greene	32,441	-2.20%	$35,806	$47,952	2,536
Lawrence	45,495	-1.40%	$36,058	$46,890	3,319
Martin	10,226	-1.50%	$38,788	$47,717	728
Monroe	144,705	4.90%	$35,335	$45,341	5,149
Orange	19,605	-1.20%	$33,308	$40,918	1,634
Sullivan	20,928	-2.50%	$31,546	$44,939	1,609
Washington	27,827	-1.50%	$35,615	$43,498	2,168
Average	38,714.3		$36,785.30	$46,294.10	

The average salary for an employee at NSA Crane is $63,095.54 which is 41% higher than the average Per Capita Income for the study region. In comparison to the state, the study region lags behind when compared to state's per capita income of $41,940, and median household income of $50,510. Only Dubois County's per capita and median household incomes were higher than the state. The overall population change for the State of Indiana for the same period was 2.30%. Only three of the counties in the study area had population increases; Daviess, Dubois Commuting Patterns

[10] Stats Indiana, County Profiles, http://www.stats.indiana.edu/profiles/profiles.asp?scope_choice=a&county_changer=18000

Indiana counties have available six different types of local option income taxes they can use to generate revenue; County Option Income Tax, County Adjusted Gross Income Tax, County Economic Development Income Tax, Local Option Income Tax to freeze property tax growth, Local Option Income Tax to replace property taxes, and Local Option Income Tax to support public safety. Special income taxes may be available through legislation to individual counties. Each county's income tax rate is slightly different depending on the makeup of the rate. County income taxes are distributed to the employees' counties of residency.

Figure 8. Income Taxes Revenues

Income Tax Revenues Generated by NSA Crane Employees			
County	Wages Earned by NSA Crane Employees	County Income Tax Rates[11]	Income Tax Revenue Generated
Crawford	$0	1.00%	$0
Daviess	$19,364,773	1.75%	$338,883.53
Dubois	$5,869,188	1.00%	$58,691.88
Greene	$34,630,338	1.25%	$432,879.22
Lawrence	$40,302,884	1.75%	$705,300.48
Martin	$25,596,309	1.50%	$383,944.63
Monroe	$69,814,896	1.10%	$764,473.11
Orange	$2,078,098	1.25%	$25,976.33
Sullivan	$1,356,840	0.30%	$4,070.52
Washington	$416,909	2.00%	$8,338.19
Total Income Tax Revenue Generated			$2,722,558

Wage data provided by NSA Crane.

The income tax generated from NSA Crane employee wages is one of the most direct impacts NSA Crane has on local communities. These taxes are distributed, based on population, to the county of residence, cities/towns, townships, libraries, and other entities such as fire protection districts.

Commuting Patterns

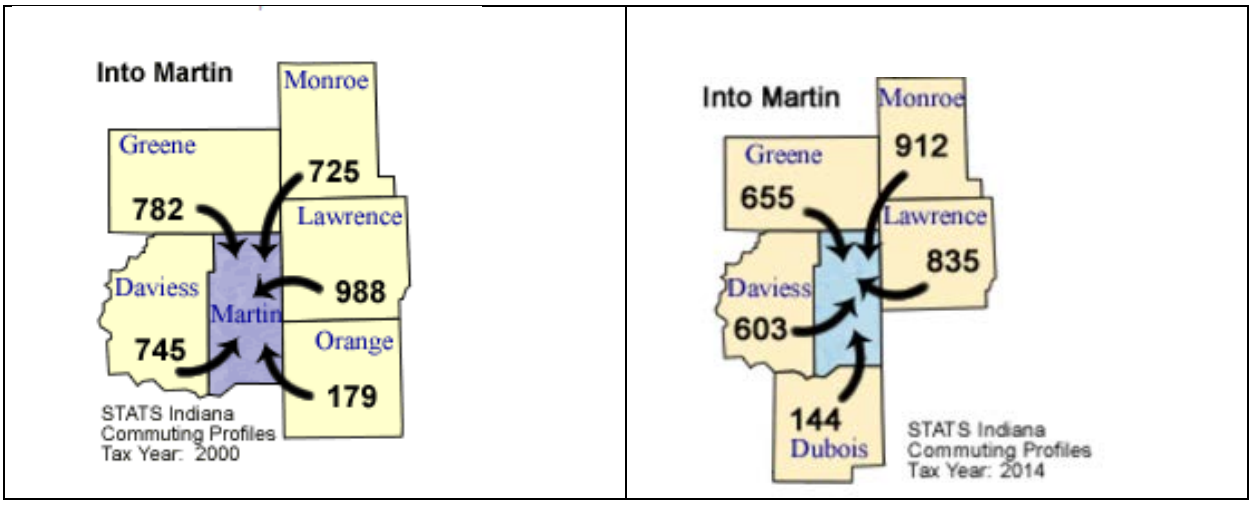
A survey conducted for this project of local economic development officials in March 2017 indicate that the employment opportunities created by NSA Crane are critical to their communities. One official responded, "Various career and educational opportunities as well as business development and expansion, research and development . . . it is an economic driver. A lot of our

[11] McKim, G. (2017, March 17). 2016 Local Income Tax Rates - How Does Monroe County Compare? Retrieved from https://in53.wordpress.com/2016/03/17/2016-local-income-tax-rates-how-does-monroe-county-compare/

strategic plan centers around NSA Crane and WestGate." Another economic development professional noted, "NSA Crane is an essential piece to our local economy; not only do many of our community members work on base, several hundred more individuals work in defense-related spinoff(s)."[12]

Over the past 14 years, there has been a subtle shift in commuting patterns to Martin County:[13]

Figure 9. Commuting Patterns Trends



In 2000, the top five counties sent 3,441 commuters into Martin County for employment. By 2014, the top five counties sent 3,149 which is a reduction of 8.48%. Lawrence, Orange, Daviess and Greene Counties all had reductions in the number of employees it sent to Martin County, whereas Monroe County had an increase of 25.45%. Tables 10 and 11[14] below show the top five counties sending and receiving workers from Martin County. Martin County receives two times as many workers as it sends to other counties.

[12] Community & Economic Impact Survey of local economic development professions conducted through SurveyMonkey, March 2017.
[13] STATS Indiana, using data from the Indiana Department of Workforce Development, http://www.stats.indiana.edu/profiles/profiles.asp?scope_choice=a&county_changer=18101
[14] Stats Indiana, based on Indiana IT-40 Return for Tax Year 2014, http://www.stats.indiana.edu/dms4/commuting.asp

Figure 10

Top Five Counties *Sending* Workers into Martin County (2014)	
County of Origin	**Number of Workers Received**
Monroe	912
Lawrence	835
Greene	655
Daviess	603
Dubois	144
Total	3149

Figure 11

Top Five Counties *Receiving* Workers from Martin County (2014)	
County of Origin	**Number of Workers Received**
Dubois	637
Daviess	418
Lawrence	158
Orange	146
Monroe	79
Total	1438

Comparing commuting data to employee data, the majority of commuters to Martin County work for NSA Crane:

Figure 12. Percentage of Commuters by County

Commuting Data			
County	**Commuters based on IT-40 Tax Returns[15]**	**NSA Crane Employees based on Wage Information[16]**	**% of Commuters working at NSA Crane**
Monroe	912	944	103.50%
Lawrence	835	683	81.70%
Greene	655	563	85.90%
Daviess	603	331	54.80%
Dubois	144	85	59%
Total	3,149	2,606	

While not all commuters may work at NSA Crane, data regarding Monroe County does indicate that all Monroe County commuters are likely NSA Crane employees. Inconsistency in the

[15] *Ibid*.
[16] Employee data provided by NSA Crane.

numbers may be due to timing in the collection of employee wage information or tax reporting errors.

Housing

Commander Craddock noted during his discussion on January 9, 2017, that housing availability is a concern for NSA Crane in recruiting and retaining employees. According to the FY 15 NSA CR Economic Impact Report dated October 1, 2014 – September 30, 2015, there are 77 total housing units available broken down as:

Figure 13

Housing Breakdown at NSA Crane[17]	
Type of Dwelling	**Quantity**
Occupied Government Housing	0
Occupied Government PPV Housing	24
Owned Private Dwellings	7
Rented Private Dwellings	46
Total	77

Housing starts, defined the number of new construction housing started, are considered a leading indicator; showing potential changes in the economy. Housing developers will build housing when they are confident that it will sell. The construction of the house promotes jobs in the area whose incomes are recycled back into the community. Once sold, the ripple effects include typical new homeowner expenditures such as appliances, furniture, and landscaping.

[17] Housing data provided by NSA Crane.

Figure 14

Housing Starts (Units)[18]						
County	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Crawford	0	0	0	0	0	0
Daviess	42	41	15	23	4	6
Dubois	81	80	84	107	124	93
Greene	0	0	0	0	0	0
Lawrence	8	12	11	27	42	8
Martin	0	3	2	3	8	5
Monroe	261	236	421	316	521	372
Orange	5	4	4	4	1	1
Sullivan	1	4	1	2	2	2
Washington	31	26	43	45	32	34
TOTAL	429	406	581	527	734	521

The counties with the top three housing starts, Dubois, Monroe, and Washington had varied housing types. Only 54.9% of Monroe County's building permits were for single-family structures whereas 100% of Washington County's building permits were for single family structures. Seventy-nine percent (79.3%) of Dubois County's building permits were for single family structures. According to The State of Indiana's Housing Market 2017, "After some gains in 2012 and 2013, the annual number of permits for new housing units in the state has been essentially flat over the last three years . . . ."[19] However, sales of existing homes were up in 2016 and foreclosures for the state below 2 percent.

[18] Stats Indiana, Building Permit Data, http://www.stats.indiana.edu/bp/

[19] *The State of Indiana's Housing Market 2017*, Kinghorn, Matt and Caplan, Zoe, Indiana Business Research Center, Kelley School of Business, Indiana University, February 2017.

Figure 15

Existing Home Sales by County[20]						
County	Existing Home Sales 2015	Existing Home Sales 2016	Percent Change	Median Sales Price 2015	Median Sales Price 2016	Percent Change
Crawford	74	91	23.0%	$84,750	$80,400	-5.1%
Daviess	194	224	15.5%	$85,000	$99,500	17.1%
Dubois	341	388	13.8%	$135,000	$131,000	-3.0%
Greene	192	190	-1.0%	$82,500	$78,000	-5.5%
Lawrence	421	441	4.8%	$87,000	$96,950	11.4%
Martin	47	62	31.9%	$86,950	$81,500	-6.3%
Monroe	1,646	1,844	12.0%	$165,000	$168,958	2.4%
Orange	40	42	5.0%	$60,000	$60,050	0.1%
Sullivan	120	113	-5.8%	$69,500	$75,000	7.9%
Washington	250	283	13.2%	$91,000	$95,450	4.9%
Average				$94,670.00	$96,680.80	2.39%

Given the average wage of an NSA Crane employee of $63,095.54, homeownership is within reach of those who desire it. If the average median sales price is $96,680.80 at a 30-year fixed rate of 4.37% (bankrate.com), the monthly mortgage payment without taxes and insurance would be $479.51. Assuming monthly property tax costs of $125 (using the median rate of 1.55[21]) and a residential insurance cost of $70 per month, the total cost of homeownership excluding utilities is $674.51. Using HUD's recommendation that no more than 30% of a household's gross monthly income should go towards housing costs and assuming the NSA Crane employee's income is the household income, this well under the recommended cap of $1,577.

Key findings in the State of Indiana Consolidated Plan included the need for affordable housing in good condition and affordable workforce housing.[22] Workforce housing is defined, for the purpose of this report, as a range of housing options that are affordable to households with earned income in reasonable proximity to the workplace. As noted above, owner-occupied housing in the study area is affordable. Rental housing, an important type of workforce housing, is not as plentiful in the study area; however, it is generally affordable.

[20] *Ibid*. Appendix.
[21] Property Tax Rates by County. (2016, May 5). Retrieved from http://www.stats.indiana.edu/dms4/propertytaxes.asp
[22] State of Indiana Consolidated Plan 2015-2019 Office of Community & Rural Affairs, http://www.in.gov/ocra/files/FULL%20PLAN%20State%20of%20Indiana%202015-2019%20Consolidated%20Plan--amended%2011-2016-no%20scanned%20comments.pdf, Section III, pg. 8.

Figure 16

Median Rent by County[23]			
County	**Number of Units**	**Percent Distribution in County**	**Median Rent (2014)**
Crawford	781	14.20%	$331
Daviess	2,949	23.60%	$416
Dubois	3,509	20.10%	$465
Greene	2,708	17.90%	$402
Lawrence	3,997	19.00%	$452
Martin	773	16.20%	$375
Monroe	24,686	41.50%	$688
Orange	1,839	20.10%	$386
Sullivan	2,046	23.00%	$436
Washington	2,213	18.10%	$452
Average			$440.30

With the development of I-69, desirable housing that is easily accessible to NSA Crane is probable. The recently completed Joint Land Use Study notes a need for high-quality housing proximate to NSA Crane. This study recommends that the counties in its study area, Daviess, Greene, Lawrence, Martin, and Sullivan, update their Comprehensive Plans for Housing and develop a regional housing plan.

[23] Stats Indiana, County Profiles, http://www.stats.indiana.edu/profiles/profiles.asp?scope_choice=a&county_changer=18000

Figure 17

Units with Housing Problems[24]					
County	Total units occupied	Household has 1 of 4 housing problems (owner)	Household as 1 of 4 housing problems (renter)	Total	Percent of Total
Crawford	4,303	800	235	1,035	24.1%
Daviess	11,329	1,395	790	2,185	19.3%
Dubois	16,133	1,970	1,165	3,135	19.4%
Greene	13,487	2,075	1,015	3,090	22.9%
Lawrence	18,811	3,560	1,695	5,255	30.0%
Martin	4,216	510	305	815	19.3%
Monroe	54,864	6,225	14,795	21,020	38.3%
Orange	7,872	1,130	725	1,855	23.6%
Sullivan	7,823	1,095	1,060	2,155	27.5%
Washington	10,850	2,165	775	2,940	27.1%
Average	14,968.8	2,092.5	2,256	4,348.5	25.15%

They further suggest exploring public-private development opportunities between the Navy, local units of government, and private developers. The creation of additional rental units may be desirable along the I-69 corridor and the counties in the study area may be able to take advantage of opportunity through various programs such as the Low-Income Housing Tax Credit (http://www.in.gov/myihcda/rhtc.htm) or other State housing assistance programs (http://www.in.gov/ihcda/2489.htm).

The development WestGate@Crane and I-69 will likely increase the impact that NSA Crane has on the surrounding counties. According to the *Economic Impacts of the Southwest Indiana Highway Corridor* report prepared for the Indiana Department of Transportation for the development of I-69 (1996), "reduced travel times associated with the proposed project will benefit both individual businesses and the entire Southwest Indiana economy." In addition to I-69's improving product distribution for NSA Crane, it expands employee residency options and further broadens NSA Crane's impact on Southcentral and Southwest Indiana.

In David B. Audretsch's book Everything in its Place Entrepreneurship and the Strategic Management of Cities, Regions, and States, Audretsch noted that networks, linkages, and interactions between people and organizations in a region strengthen that region's economy by facilitating a "high flow of knowledge and best practices, as well as a complex combination of

[24] HUD Consolidated Planning/CHAS Data, https://www.huduser.gov/portal/datasets/cp.html#2005-2007

both competition and cooperation."[25] NSA Crane ties the communities in southwest Indiana together through its employment base, and southwest Indiana has realized this regional impact and is working to capitalize on it through several regional planning efforts.

Radius Indiana is a regional partnership tasked with serving as a point in contact NSA Crane and leads regional collaboration to attract, retain and expand businesses in the area. The eight partner counties are Crawford, Daviess, Dubois, Greene, Lawrence, Martin, Orange and Washington. The Regional Opportunity Initiative, Inc. (ROI), is to support regional development opportunities by creating a native workforce to meet the demands of regional employers including NSA Crane. Those 11 county partners include Brown, Crawford, Daviess, Dubois, Greene, Lawrence, Martin, Monroe, Orange, Owen and Washington. These regional efforts allow for the sharing of best practices and collaboration with the goal of expanded economic opportunity for the region that includes NSA Crane. Economic development professionals surveyed feel very connected to NSA Crane and its activities. One professional noted when asked how NSA Crane could improve the overall economic impact on your community that "They're currently doing that. Training opportunities have increased and they have become more transparent to the surrounding communities. I say they need to keep doing what they are doing."[26]

State resources are available to assist in these efforts. The South Central Small Business Development Center works through its host organization, the Gayle & Bill Cook Center for Entrepreneurship Indiana Center for Life Sciences, to develop small businesses in the region. Counties within the South Central Small Business Development Center include Brown, Crawford, Daviess, Dubois, Greene, Lawrence, Martin, Monroe, Orange, and Washington. The Office of Community and Rural Affairs is the State of Indiana's division that distributes Community Development Block Grant and other funds to non-participating jurisdiction communities. The above-listed counties are separated into three different community liaison districts; West Central District, Southwest District, and Southwest District. The Indiana Economic Development Corporation, which provides incentives and resources for business expansion and attraction for the State, places those listed counties into two separate regional offices; Central and Southwest. The inconsistent layering of these regional and local efforts may make regional efforts more complicated. In order to more efficiently utilize resources available through these various entities, NSA Crane along with the regional partner organizations may wish to request the State align their division/department/program districts.

One such regional effort, the Regional Opportunities Initiative, Inc., recently completed occupational needs assessments for three employment sectors in southcentral Indiana; Life Sciences, National Security & Defense, and Advanced Manufacturing. The SWCI Occupational Needs Assessment – National Security and Defense Sector Report notes that there are 8,439

[25]Audretsch, David B., Everything in its Place Entrepreneurship and the Strategic Management of Cities, Regions, and States, Oxford, 2015, pg. 86.
[26] Community & Economic Impact Survey of local economic development professions conducted through SurveyMonkey, March 2017.

defense sector jobs in the region and that 23% of the employees in this sector are age 55 or older.[27] In addition to replacing aging workers, job projections for this sector estimate a demand of 650 jobs per year. Commander Craddock stated that it is easier to attract and retain employees who come from the region. To develop this future workforce, the educational systems in the area need to evaluate their STEM curriculum.

Current Engagement - Community Outreach

In addition to the employment and housing resources which it provides, Crane and its employees actively engage with the community through various outreach efforts. Crane's largest tenant, the Naval Surface Warfare Center (NSWC), encourages employees to volunteer throughout the year. NSWC estimates that about 1720 hours per year are allocated toward their voluntary efforts. These efforts focus primarily on the support of elementary and high school students in the region through tutoring, mentoring and field trips, as well as the promotion of science, technology, engineering and mathematics (STEM) in the form of "science workshops, kits for engineers to share in the classroom, and the lending library".[28] Employees also volunteer with the SeaPerch competition through the mentoring of robotic teams, "helping over 500 students gain knowledge of STEM". Totaled, NSWC Crane has supported 128 teachers in the community and impacted more than 37 schools in the region through its STEM outreach efforts.[29] Combining the estimated number of volunteer hours with the base salary for grade 12 Crane employees, the annual in kind contribution of Crane employees is around $60,000.[30]

The Chief Technology Office (CTO) of NSWC Crane further implements the STEM educational efforts by engaging academic organizations through its University Engagement section. These efforts initiate and foster relationships with educational institutions; programs include Alternative Funding Opportunities (Grants, Broad Agency Announcements, Broad Ordering Agreement, Research Appointments, Student Internships and CO-OPs and Science, Mathematics and Research for Transformation (SMART) PhD programs.[31] Crane also provides important resources to academic organizations through its facilities. In 2015, NSA Crane signed an agreement with Indiana University to provide IU students and faculty with opportunities "to visit the base and use it as a research lab, share equipment with Crane and work more closely and more directly with Crane researchers on Crane's projects or their own projects."[32] These types of partnerships provide additional educational opportunities to community members and strengthen Crane's presence in the region.

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[27] SWCI Occupational Needs Assessment – National Security and Defense Sector Report, https://swcindianadotorg.files.wordpress.com/2017/04/ona-defense-4-11-17.pdf, pg. 4.
[28] NSWC Crane Division: Educational Outreach. (n.d.). Retrieved from http://www.navsea.navy.mil/Home/Warfare-Centers/NSWC-Crane/Partnerships/Educational-Outreach/
[29] *Ibid.*
[30] Base salary (grade 12) - $72,663 / 2080 for hourly rate - $34.75 * 1720 = in kind contribution [$59,770]
[31] NSWC Crane Division: Educational Outreach. (n.d.). Retrieved from http://www.navsea.navy.mil/Home/Warfare-Centers/NSWC-Crane/Partnerships/Educational-Outreach/
[32] Demkovich, L. (2015, October 22). IU signs agreement with NSA Crane. *Indiana Daily Student*. Retrieved from http://www.idsnews.com/article/2015/10/iu-signs-agreement-with-nsa-crane

The number of volunteer hours presented above certainly does not account for the myriad other ways in which Crane and its employees contribute to the community through charity and other volunteerism. Crane partners with organizations like the American Red Cross, Habitat for Humanity, March of Dimes and Toys for Tots to host annual and semi-annual blood drives, toy drives and other charity events. These events draw high levels of employee participation: NSA Crane surpassed 1,000 blood donations in the year 2011 alone through its blood drive with the American Red Cross.[33] Crane's Toys for Tots program donates to four local counties: Greene, Martin, Davies and Lawrence. Each year, between three and four thousand toys are sent to 2,000 kids in these communities.[34]

NSA Crane also conducts community outreach through the hosting of thousands of visitors to the Installation annually for tours and briefing events. These visitors include Federal, State, and Local elected officials and community groups. Crane representatives also meet with State and community organizations[35], including:

- Indiana Office of Defense Development
- Indiana Office of Community and Rural Affairs
- Southwest Central Indiana Regional Steering Committee
- Local and Regional Economic Development Organizations
- WestGate@Crane
- Southern Indiana Mayor's Roundtable

The WestGate@Crane Technology Park adjacent to NSWC–Crane Division further fosters collaboration between Crane and local organizations, businesses and economic development corporations. Crane employees take an active role in a wide array of professional organizations in the community, positively representing Crane and contributing to its outreach efforts.

Although Crane and its employees make large efforts to partner the organization with the community, there a few ways in which this outreach could be strengthened. Through our research, we were unable to find many updated statistics about the voluntary efforts of Crane and its employees. This could be remedied by requesting quarterly or semi-annual reports from Crane tenants about their community involvement. Crane could use onsite expertise to develop a simple tracking system in which various divisions or tenants could easily enter their information. Information requested in this tracking system may include:

- Community Involvement and Investment
- Report period

[33] Collins, J. (2011, May 7). NSA Crane Gives the Gift of Life, Surpasses 1,000 Blood Donations in 2011. *Naval Support Activity Crane Public Affairs*. Retrieved from http://www.navy.mil/submit/display.asp?story_id=60221
[34] Naval Support Activity Crane – Facebook Videos. (2017). Retrieved from https://www.facebook.com/pg/NSACrane/videos/?ref=page_internal
[35] Craddock, T. A. (n.d.). Naval Support Activity Crane. Retrieved from http://cranejlus.com/images/docs/03_nsa_crane_overview_presentation_b.pdf

- Activity Description: Please describe activities conducted by your organization demonstrating your community involvement and/or investment.
- Approximate number of volunteer hours
- Average wage of volunteers

Requesting this information would not only create a more holistic view of the ways in which Crane contributes to its communities, but would also strengthen outreach efforts. Currently, NSA Crane's Facebook page[36] and website[37] do little to document Crane's many outreach and voluntary efforts. By Crane should use the various social media platforms it has at its disposal to better promote these activities.

[36] Naval Support Activity Crane - Facebook. (2017). Retrieved from https://www.facebook.com/NSACrane/
[37] Naval Support Activity Crane. (n.d.). Retrieved from https://www.cnic.navy.mil/regions/cnrma/installations/nsa_crane.html

Education Impact

As NSA Crane has such a large impact on the community and surrounding region, it is important to measure the impact on education in the region. There are opportunities for professional development and higher education of current employees. NSA Crane has also been able to work with local universities and K-12 schools to create more STEM introductions to the younger population in the region. Next we looked at the region for a overview of educational attainment and analyze the graduation rates and college enrollment trends for each county. Lastly, we analyzed the recruitment and retention strategies for the region, strategizing ways to attract and keep employees in the region and employed at NSA Crane.

Education of Current Employees

Professional development and adult education is an important facet of Crane's current workforce development. Currently, Stimulus Engineering offers training sessions for certifications, technology advancement, and specific course learning. The trainings range from Microsoft Office to Cyber Series, including intelligence and analyst instruction.

Stimulus Engineering also runs Westgate Academy, offering college courses to current Crane employees. A current collaboration with University of Southern Indiana offers Crane employees the opportunity to earn an engineering degree, while attending classes at Westgate. This connects the classroom to the workforce, as there is no engineering program close to Crane. Past partnerships with Ivy Tech, Ball State, Rose-Hulman Institute of Technology, Vincennes University, and Indiana University have offered programs in the past, with specific focus of Crane and the STEM needs in the region. The growth of these programs offered at Westgate Academy would offer more opportunities for current employees.

The Naval Sea Systems Command offers several internship and recent graduate programs.[38] These are national programs, recruiting from all over the country for these spots. It is part of Executive Order 13562. Recruitment from regional and state programs might help enhance openings for graduates to stay closer to home, while filling STEM positions at Crane.

Pilot Research Study with Crane Engineers

The *Workplace Simulation Project (WSP)*, was initiated through conversations with NSWC Crane (Crane), DirectEmployers Institute, the Center for P-16 Research and Collaboration (P-16 Center) in the IU Bloomington School of Education, and Greene County Schools. The vision was to invite industry partners to set up physical space within a school classroom and bring in industry professionals to work with students weekly on authentic projects reflective of day-to-day industry operations and align their classroom curriculum. The pilot is in its second year, with funding from IU Bloomington and Indiana Department of Workforce Development, along with

[38] Naval Sea Systems Command: Internships. (n.d.). Retrieved from http://www.navsea.navy.mil/Career-Opportunities/Join-Our-Team/Internships/

pending funding proposals to National Science Foundation and US Department of Education. The program strives to provide authentic STEM experiences for K-12 students and adults who are either unemployed, underemployed and/or seeking an Indiana High School Equivalency Diploma thus positively impacting the one million jobs by 2025 state goal. These experiences will prepare participants for the 21st century workforce by building essential employability skills, and developing the knowledge, skills and dispositions necessary to pursue STEM+C careers dictated by the needs of industry partners. The fourth largest concentration of STEM-related jobs in our nation (per capita) is in southwest central Indiana at NSWC Crane (Crane). According to workforce need projections from Crane, approximately 39.5% of their workforce is between the ages of 50 – 69 (NSWC Crane Work Force Age Profile as of July 1, 2014. Source: DCPDS).

Educational attainment is of grave concern in both Greene and Martin counties. These neighboring rural counties share similar demographics and economic/workforce development needs. Educational attainment is lower than the state average. Only 11% of residents in Greene County hold a bachelor's and 58.8% a high school diploma. In Martin County, only 9.5% of the population hold a bachelor's degree and 59.9% a high school diploma compared to 22.7% bachelor's degree and 59.3% diploma in the state. In general, students lack understanding of regional career opportunities and the prerequisite knowledge/skills necessary to capitalize on the opportunities. The most recent data available show students at both intended project schools score fairly well in state accountability tests. However, they consistently score below the state average on pre-college tests and many must take remediation coursework to be prepared for college. Research[39] proves that students who need post-secondary remediation coursework are at a greater risk of not completing a degree[40]. Regionally, more than 85% of high school graduates go on to pursue post-secondary training, but only 22 – 28% actually complete a degree in six years.[41]

The importance of these partnerships and bringing STEM professionals into K-12 settings can increase high school graduation rates and encourage more students to enter STEM degree programs, along with connecting professional engineers with the students. This community outreach combined with education research in the region hopes to encourage more local students to enter STEM careers and employ at Crane.

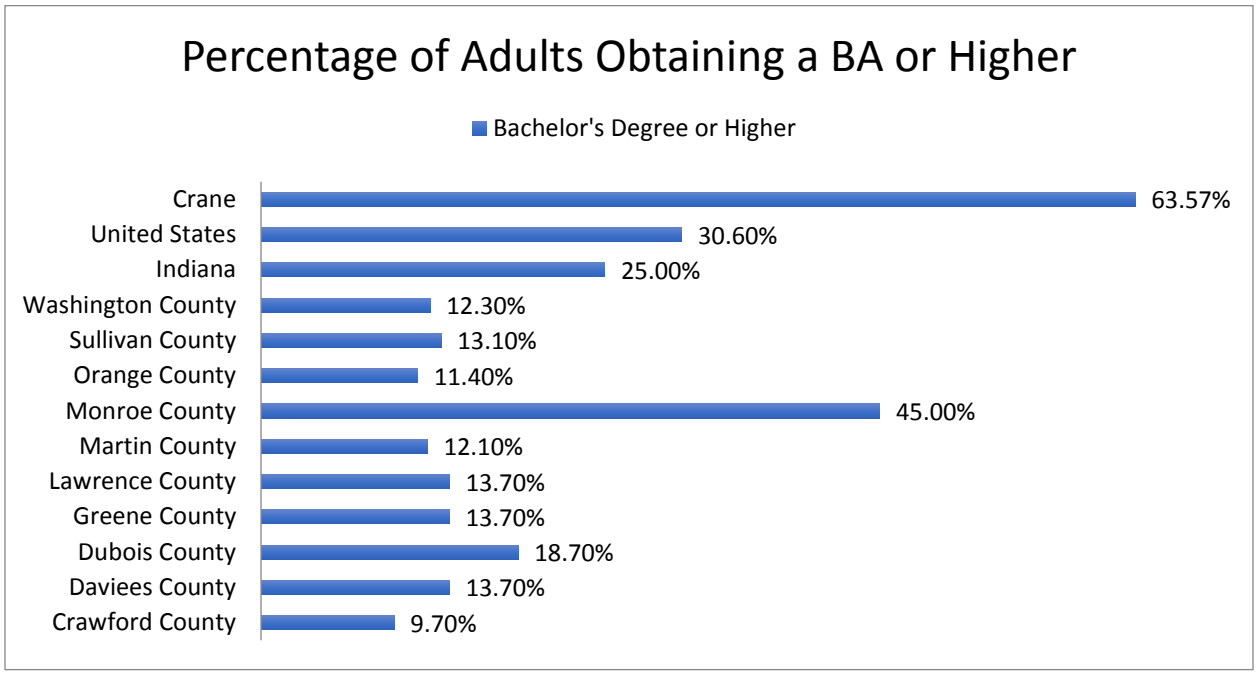
Regional Education Profile

In the primarily rural counties surrounding NSWC Crane, the base aims to positively influence the educational opportunities of the residents. A workforce comprised of nearly 70 percent engineers, scientists and technicians, Crane serves as a beacon of highly educated personnel in an otherwise educationally deprived region.[42] The base attracts federal aid to local schools, and discussed in

[39] http://www.hamiltonproject.org/assets/legacy/files/downloads_and_links/higher_education_remediation_long.pdf
[40] *Time is the Enemy* (Rep.). (2011, September). Retrieved http://www.completecollege.org/docs/Time_Is_the_Enemy.pdf
[41] STATS Indiana and Indiana Commission for Higher Education
[42] NSA Crane Presentation (1/9/2017)

Community Impact, Crane's employees participate in a range of programs that enrich the education of the region's young people.

Figure 18

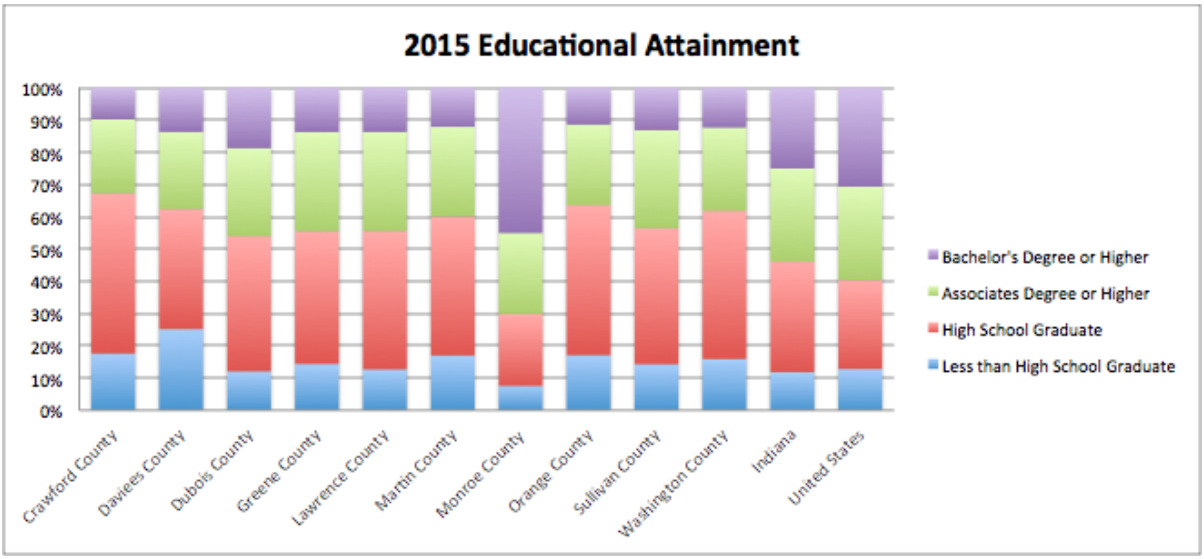


Source: U.S. Census Bureau, 2015 American Community Survey 1-Year Estimates

Recent reports by Southern Indiana Development Commission (SIDC) address the growth in educational attainment across the region. The report noted that within SIDC region, educational attainment between 2000 and 2013 increased in the proportion of educated residents who have some college, associates, or bachelor's degrees. The proportion of graduate or professional degree recipients remained same during 2000 and 2013. Overall, the proportion of resident population age 25 years and over with higher than high school education increased by 7.8 percentage points between 2000 and 2013.[43]

[43] CEDS 2015 Southern Indiana Development Commission Report, pg. 5

Figure 19



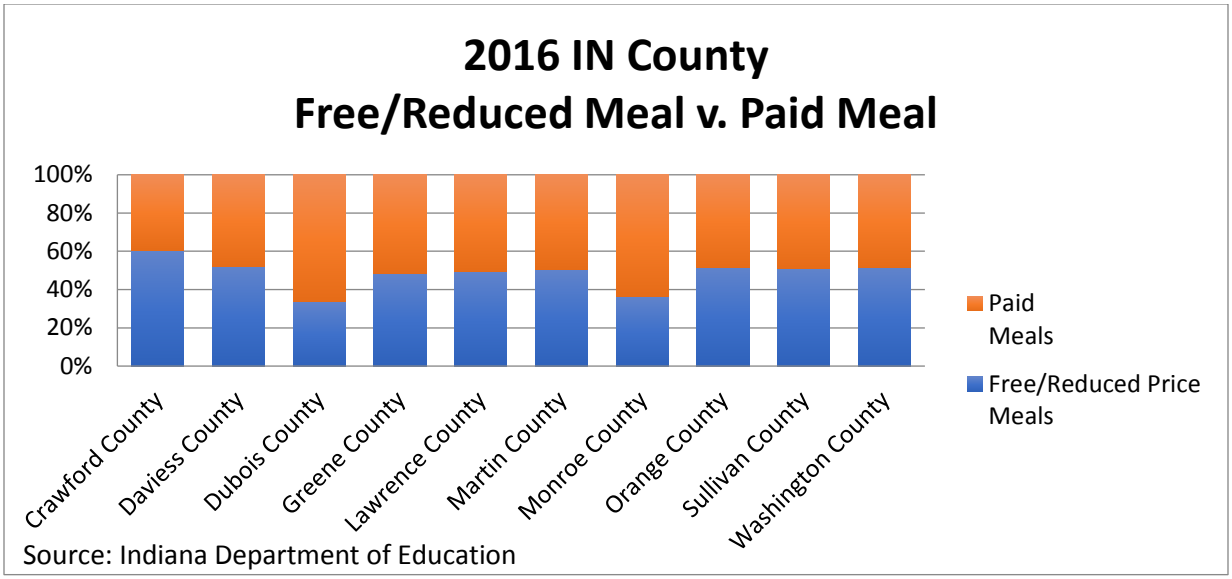
Source: U.S. Census Bureau, 2015 American Community Survey 1-Year Estimates

We observed an unequal distribution of educational attainment across the counties as we began to compare 2015 data. Dubois and Monroe Counties are unique in their proportion of residents age 25 and over that pursued a higher education degree. While the influence of Indiana University-Bloomington influences the distribution of education in Monroe County, Dubois closely resembles the state and national averages of educational attainment.[44] Within five out of the ten counties in Crane's purview, 60 percent of the residents hold a high school degree or less. Crawford, Daviess, Martin, Orange and Washington represent the highest needs for additional education investments on behalf of Crane and their regional partners. By emphasizing investments within these five counties, Crane can represent a vital partner in curtailing the large subset of the population that experience high barriers to access quality, affordable education.

As educational resource allocation was reviewed further, a similar trend was found regarding the socio-economic needs of families in the region. A review of the federal Free and Reduced (F&R) lunch programs in 2016 found eight counties whose student population is comprised of 50 percent F&R lunch students. Similar to the educational attainment in the ten-county region, only Dubois and Monroe Counties consisted of a student population on F&R lunch below 40 percent.

[44] National Averages: Less than High School Graduate- 12%, Highschool Graduate- 27%, Associates Degree or Higher- 28%, Bachelor's Degree or Higher-30%

Figure 20



County Profiles

In order to evaluate Crane's educational impact on the South-Central Indiana Region, a thorough analysis of the state of Primary, Secondary and High Education from each county is profiled. The goal of each county profile is to do the following:

1. Assess trends at the county level for educational growth and improvement
2. Provide strategies for future Crane education initiatives
3. Provide suggestions regarding recruitment and retention of Indiana educated students

Crawford County

The state of education in Crawford County is one of predominately negative trends. Over the past three academic years, Crawford County has ranked as one of the lowest graduation rates. The declining rates for graduation in the county is further exacerbated by declining attendance statistics over a ten-year sample. The 2015-16 academic year represented the lowest attendance rate as it dropped to 95.20% of the student population. Considering the high F&R rate and significant gaps in educational attainment within the county, the allocation of resources to Crawford County Community School Corporation may yield positive returns for Crane.

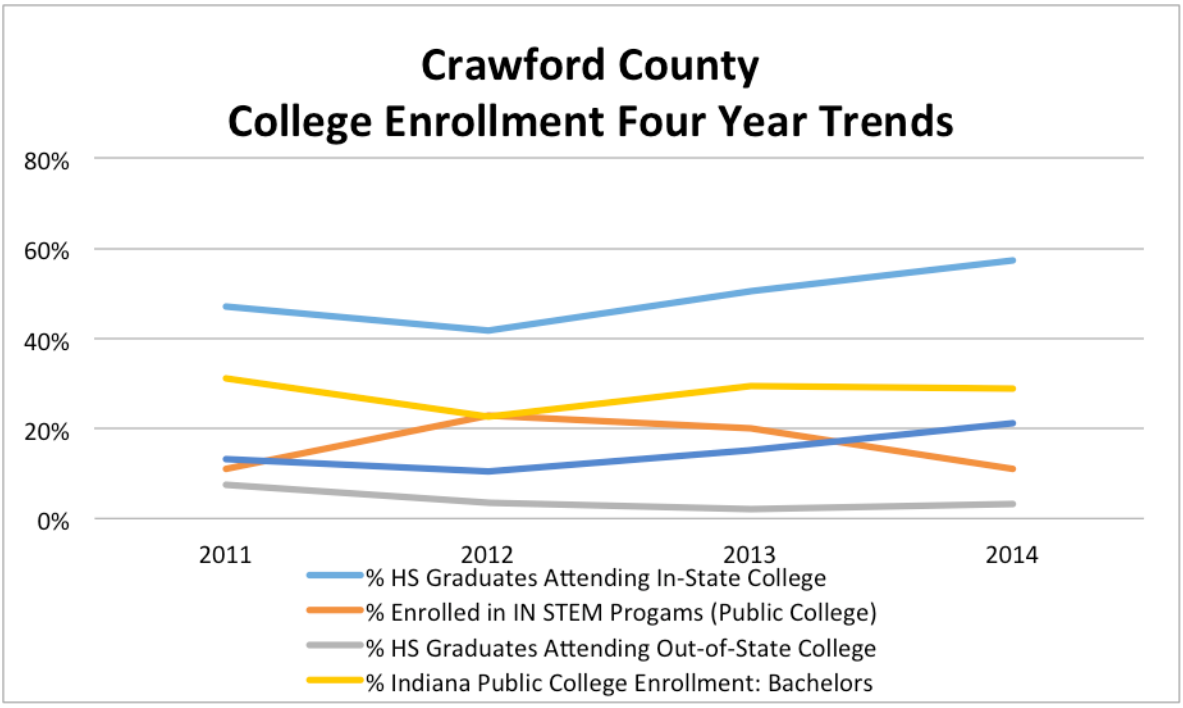
When considering potential initiatives to positively influence the educational outcomes of the county, Crane may seek to leverage the increase rate of college enrollment seen in the county. Growth in the pursuit of Associates degrees by 8 percent and an increase in the percentage of students attending In-State Universities by 15 percent are encouraging trends for the future of Crawford County. This uptick in higher education enrollment may provide opportunities for Crane to invest in the high school population through an expansion of their STEM education initiatives.

Figure 21

Crawford County Graduation Rate Trends				
		2014	2015	2016
Female	Cohort Count	57	52	44
	Graduates	51	51	37
	Grad Rate	90%	98%	84%
Male	Cohort Count	49	68	56
	Graduates	43	59	49
	Grad Rate	88%	87%	88%
Total	Cohort Count	106	120	100
	Graduates	94	110	86
	Grad Rate	89%	92%	86%

Crawford County Attendance Trends	
2015-16	95.20%
2014-15	95.40%
2013-14	96.60%
2012-13	96.80%
2011-12	97.10%
2010-11	96.90%
2009-10	97.00%
2008-09	97.80%
2007-08	96.40%
2006-07	97.10%
2005-06	96.40%
Average	96.61%

Figure 22



Source: Indiana Department of Education

Daviess County

Graduation and attendance rates within the three school corporations in Daviess County have been consistent over the period reviewed. Unlike Crawford County, no alarming trends exist that

warrant intervention. With rates of attendance static at 96 percent and graduation rates between 95 and 98 percent, education investment in Daviess County needs to focus on higher education enrollment.

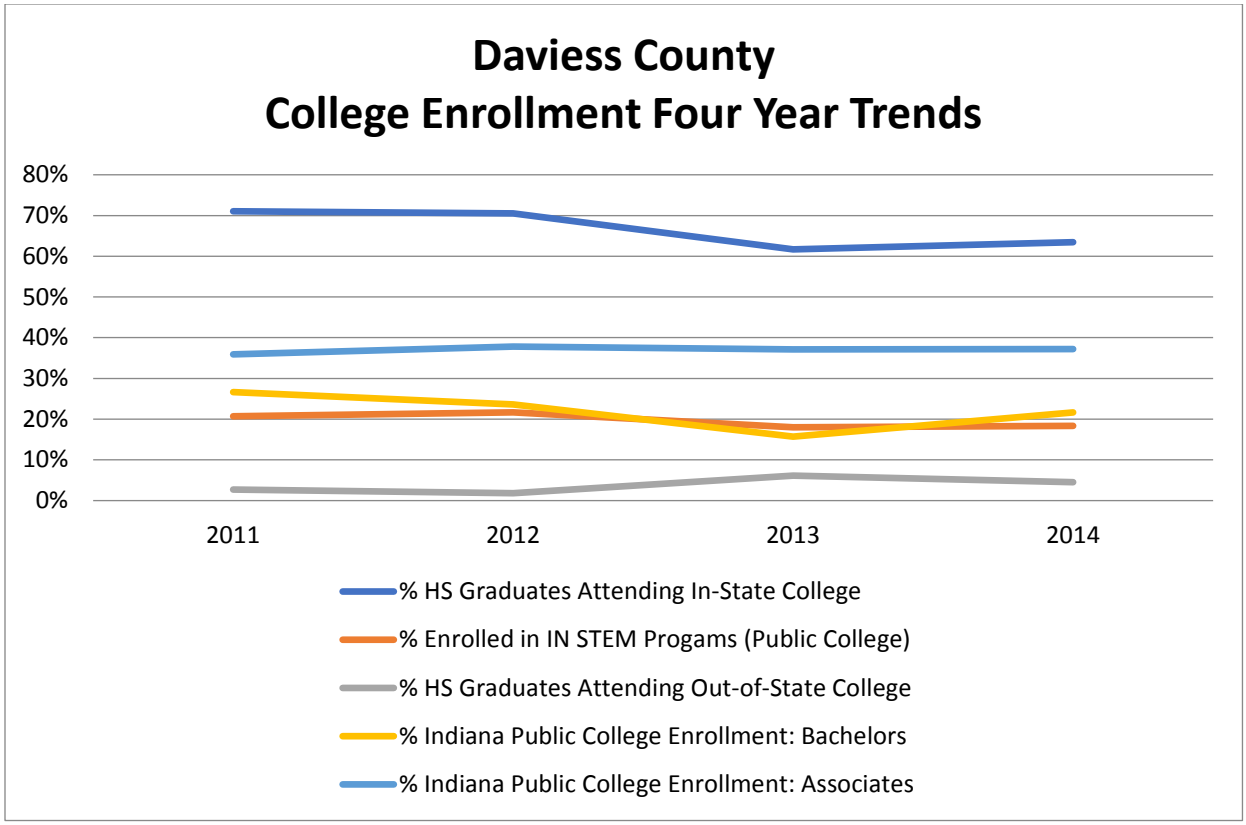
Over a four-year period, steady declines in In-State University enrollment and the pursuit of Bachelor's degrees is noteworthy. In-State enrollment decreasing by 8 percent while the pursuit of Associates degrees has been static and Bachelor's degrees have slumped to 22 percent are all matters that Crane should be aware of. With over 4,500 students attending Daviess County schools adjacent to Crane, the inability to translate positive graduation and attendance rates into higher education enrollments is the sort of drain to the region that Crane hopes to avoid. A promising note regarding higher education enrollment in Daviess is that nearly 20 percent of students are pursuing STEM fields of study. This represents an opportunity for Crane tenants to continue integrating themselves the education ecosystem of the region in an effort to retain those students in STEM fields.

Figure 23

Daviess County Graduation Rate Trends				
		2014	2015	2016
Female	Cohort Count	163	136	127
	Graduates	153	135	123
	Grad Rate	94%	99%	97%
Male	Cohort Count	158	143	157
	Graduates	153	139	147
	Grad Rate	97%	97%	94%
Total	Cohort Count	321	279	284
	Graduates	306	274	270
	Grad Rate	95%	98%	95%

Daviess County Attendance Trends	
2015-16	96.67%
2014-15	96.43%
2013-14	96.90%
2012-13	96.47%
2011-12	96.67%
2010-11	96.33%
2009-10	96.50%
2008-09	96.47%
2007-08	96.63%
2006-07	96.80%
2005-06	96.70%
Average	96.60%

Figure 24



Source: Indiana Department of Education

Dubois County

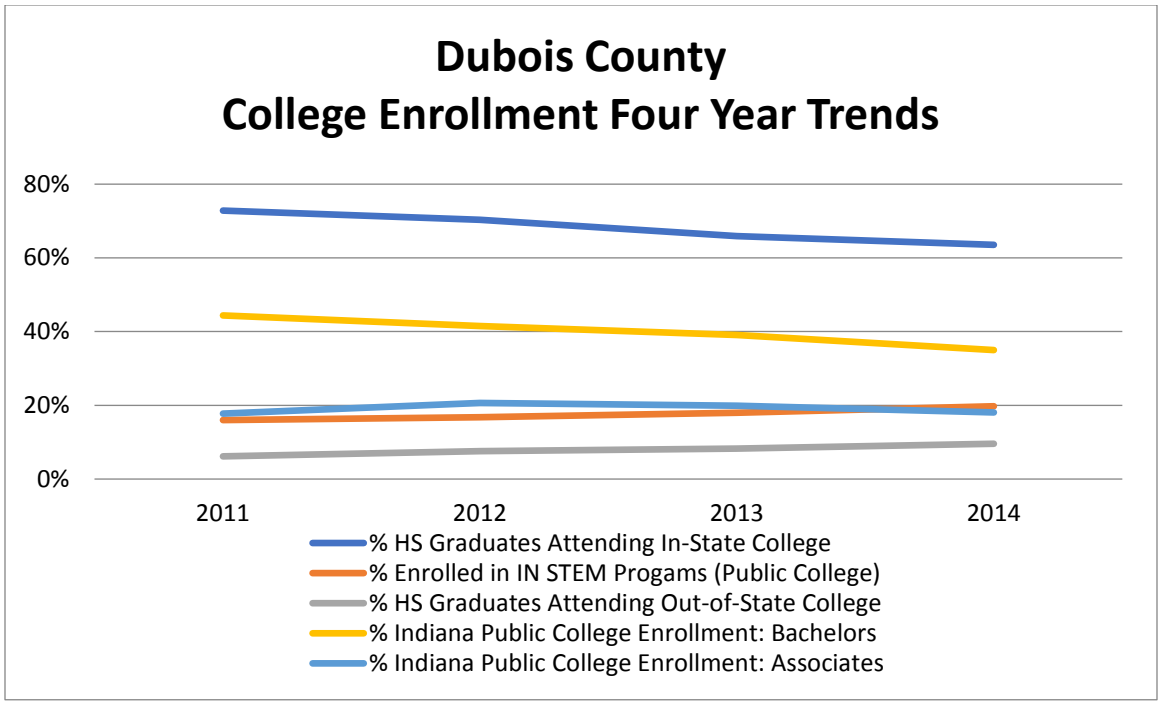
The attendance and graduation statistics reflect the other strong educational data noted in the regional analysis. The county is graduating a consistent 95 percent of students and annually as attendance rates at 97 percent. However, declining trends in In-State enrollment and pursuit of Bachelor's degrees show there is room for improvement. Across the ten-county region, Dubois had one of the highest rates of in-state enrollment in 2011 at 73 percent. Since then, the county steadily declined year over year. By 2014 the county was enrolling 64 percent of students in In-State schools. While this decline of 9 percentage points is significant, we believe the increased rate of Out-of-State enrollments has contributed to this decline. Considering Dubois County has a strong socio-economic position in the region, the likelihood of greater family financial resources to allocate toward Out-of-State tuition is strong.

Figure 25

Dubois County Graduation Rate Trends				
		2014	2015	2016
Female	Cohort Count	292	269	312
	Graduates	275	255	299
	Grad Rate	94%	95%	96%
Male	Cohort Count	291	278	278
	Graduates	271	265	260
	Grad Rate	93%	95%	94%
Total	Cohort Count	583	547	590
	Graduates	546	520	559
	Grad Rate	94%	95%	95%

Dubois County Attendance Trends	
2015-16	97.33%
2014-15	97.15%
2013-14	97.43%
2012-13	97.28%
2011-12	97.40%
2010-11	96.95%
2009-10	97.20%
2008-09	96.95%
2007-08	97.13%
2006-07	97.13%
2005-06	97.18%
Average	97.19%

Figure 26



Source: Indiana Department of Education

Greene County

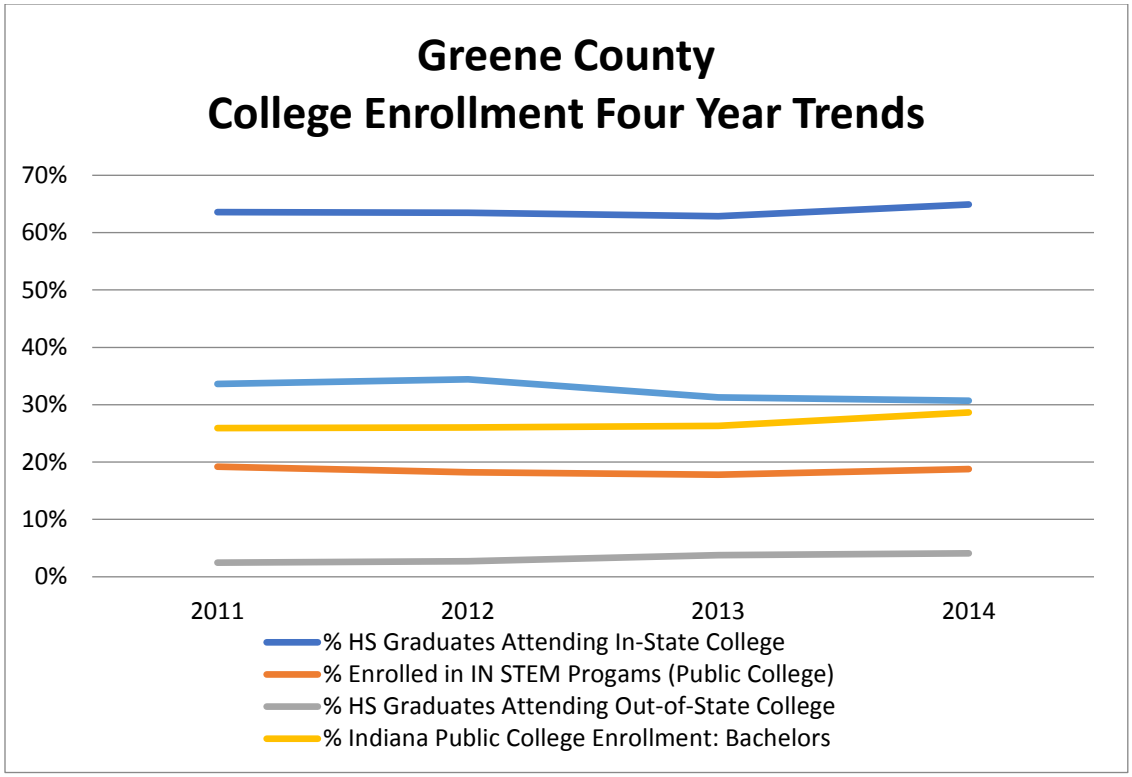
Statistical trends within the primary, secondary, and higher education populations in Greene County are challenging to infer. The county has experienced a consistently high graduate rate of 94 percent and attendance rate of 96 percent. Their college enrollment has also remained steady. A small decline in student pursuing an Associates Degree is offset by a small uptick in Bachelor's degree students. If those trends are extrapolated to the 2015-17 academic years, we can expect students interested in Bachelor's degrees to overtake Associates Degrees in the county.

Figure 27

Greene County Graduation Rate Trends				
		2014	2015	2016
Female	Cohort Count	178	172	186
	Graduates	172	166	178
	Grad Rate	97%	97%	96%
Male	Cohort Count	178	177	165
	Graduates	164	164	150
	Grad Rate	92%	93%	91%
Total	Cohort Count	356	349	351
	Graduates	336	330	328
	Grad Rate	94%	95%	93%

Greene County Attendance Trends	
2015-16	95.64%
2014-15	95.76%
2013-14	96.50%
2012-13	95.88%
2011-12	96.16%
2010-11	96.04%
2009-10	96.12%
2008-09	96.18%
2007-08	96.20%
2006-07	96.24%
2005-06	96.44%
Average	96.11%

Figure 28



Source: Indiana Department of Education

Lawrence County

Higher education growth across all major statistical categories in Lawrence County is promising for Crane. While attendance rates have remained static at 95 percent and graduation rates are some of the lowest in the county, the improvements in higher education placement is encouraging. Similar to the concerns expressed in Crawford County, only 85 percent of students graduated with a high school diploma in Lawrence County. That equates to over 70 young professionals entering the job marketplace in the lowest tier of educational attainment assessed in the regional review. With initiatives across the county to assist with student's graduation rates, Crane's expertise in STEM education may help stimulate improvements in the school corporations.

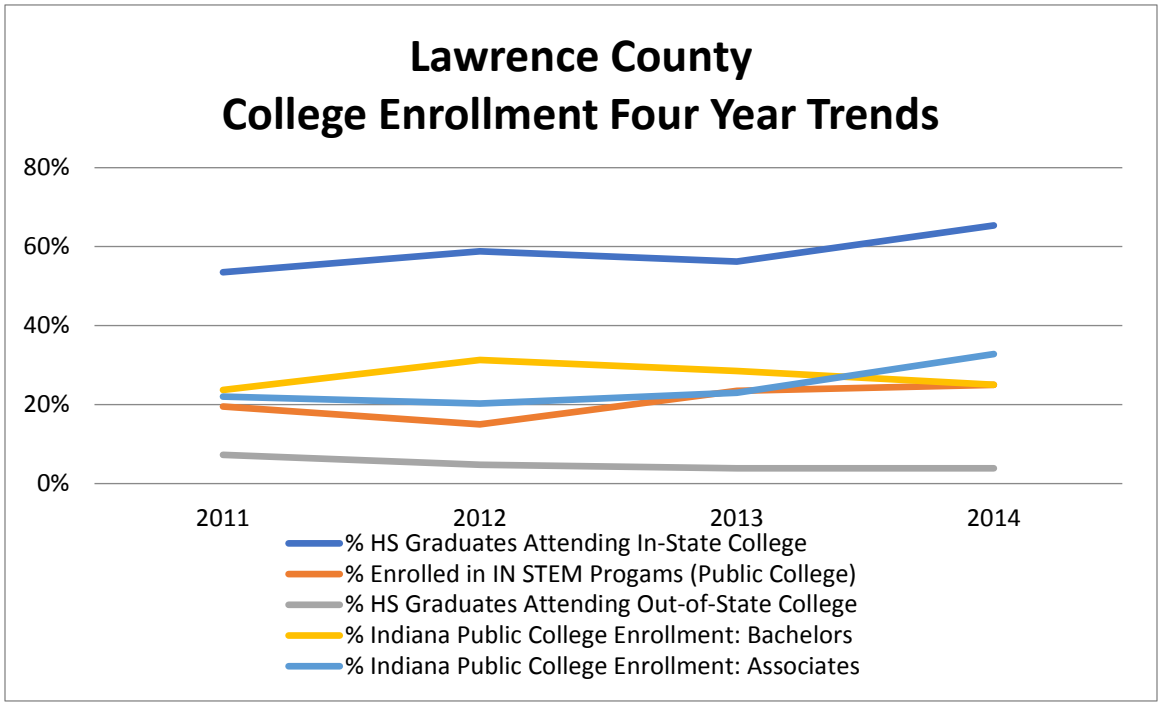
Where Crane stands to benefit from is the growth in In-State enrollment, STEM degree programs and overall Bachelor's and Associates degrees. Over the four year period, In-State enrollment grew by 9 percent while one in four students in Lawrence are pursuing degrees in STEM. By further integrating Crane education initiatives within North Lawrence Community Schools and Mitchell Community School districts, Crane can aim to nurture and retain the nearly 75 students entering STEM education fields.

Figure 29

Lawrence County Graduation Rate Trends				
		2014	2015	2016
Female	Cohort Count	232	233	233
	Graduates	204	219	206
	Grad Rate	88%	94%	88%
Male	Cohort Count	252	259	274
	Graduates	226	213	225
	Grad Rate	90%	82%	82%
Total	Cohort Count	484	492	507
	Graduates	430	432	431
	Grad Rate	89%	88%	85%

Lawrence County Attendance Trends	
2015-16	95.25%
2014-15	95.55%
2013-14	95.65%
2012-13	95.55%
2011-12	94.75%
2010-11	94.40%
2009-10	94.55%
2008-09	95.30%
2007-08	95.20%
2006-07	95.05%
2005-06	95.40%
Average	95.15%

Figure 30



Source: Indiana Department of Education

Martin County

Within Martin County, the graduation rates are consistently in the low to mid 90 percentile. This overall statistic is not alarming. However the disparity in female and male graduation rates is worth noting. Each year the student population has shown a growing gap between female and male rates,

reaching a 10 percent gulf in 2016. As Crane considers increased involvement throughout Martin County, we believe attention should be paid to the retention and growth of education programming that addresses the declining male graduation.

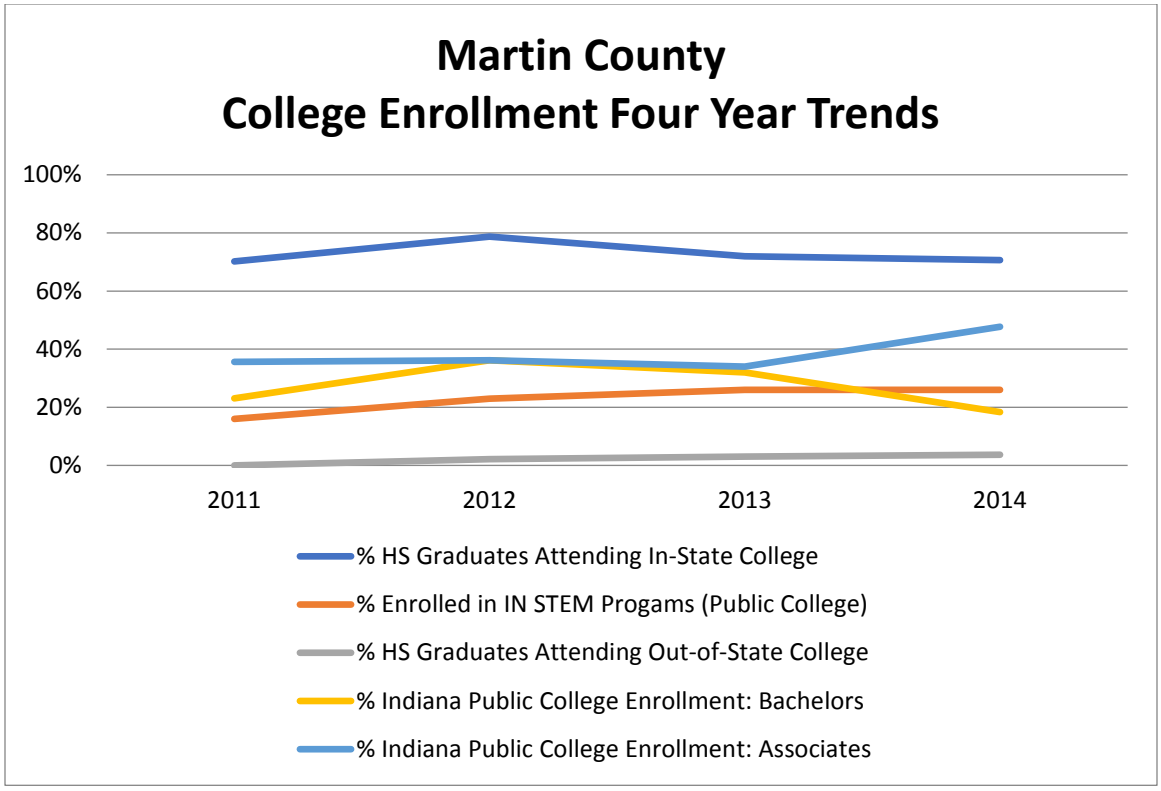
When reviewing the college enrollment trends for the county, the sharp uptick in Associates degrees can present an opportunity for Crane. Acknowledging the growth in this degree path requires career paths for this education level and ways to entice this sub-population to remain in South-Central Indiana. The increased in STEM education has grown by 9 percent over the same period. This presents further opportunities for Crane to leverage their expertise in science, technology and engineering.

Figure 31

Martin County Graduation Rate Trends				
		2014	2015	2016
Female	Cohort Count	55	58	57
	Graduates	51	55	56
	Grad Rate	93%	95%	98%
Male	Cohort Count	63	67	57
	Graduates	58	61	50
	Grad Rate	92%	91%	88%
Total	Cohort Count	118	125	114
	Graduates	109	116	106
	Grad Rate	92%	93%	93%

Martin County Attendance Trends	
2015-16	95.95%
2014-15	95.30%
2013-14	95.70%
2012-13	95.50%
2011-12	95.45%
2010-11	94.90%
2009-10	95.45%
2008-09	95.65%
2007-08	95.35%
2006-07	95.55%
2005-06	96.35%
Average	95.56%

Figure 32



Source: Indiana Department of Education

Monroe County

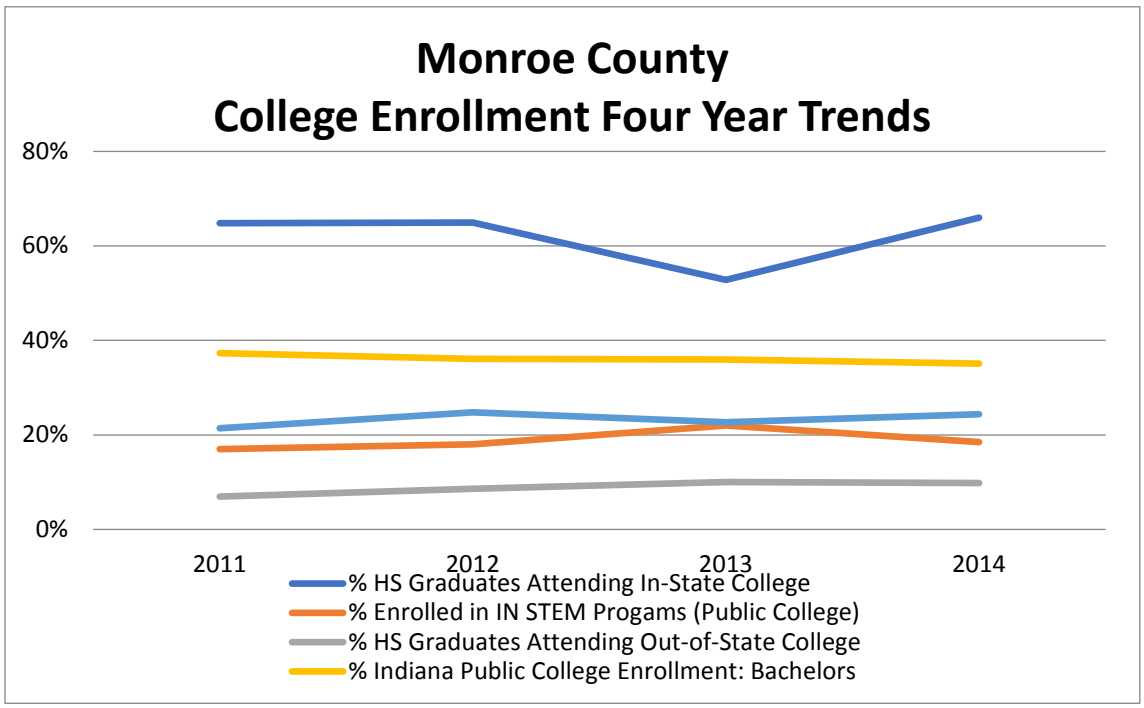
The year to year education statistics in Monroe County are consistent and reflect the stabilizing effect of Indiana University-Bloomington. The county has shown a static 96 percent attendance rate and 94 percent of the student population graduates on an annual basis. The collegiate statistics are equally consistent with the exception of 2013 In-State College enrollment. A sharp 12 percent decline in 2013 was quickly bounced back in 2014 by 13 percentage points revealing the 2013 observation to be an outline.

Figure 33

Monroe County Graduation Rate Trends				
		2014	2015	2016
Female	Cohort Count	500	502	461
	Graduates	464	482	439
	Grad Rate	93%	96%	95%
Male	Cohort Count	495	488	495
	Graduates	454	456	458
	Grad Rate	92%	93%	93%
Total	Cohort Count	995	990	956
	Graduates	918	938	897
	Grad Rate	92%	95%	94%

Figure 34

Monroe County Attendance Trends	
2015-16	96.00%
2014-15	96.05%
2013-14	96.15%
2012-13	95.80%
2011-12	96.00%
2010-11	95.75%
2009-10	95.65%
2008-09	95.85%
2007-08	95.70%
2006-07	95.45%
2005-06	96.00%
Average	95.85%



Source: Indiana Department of Education

Orange County

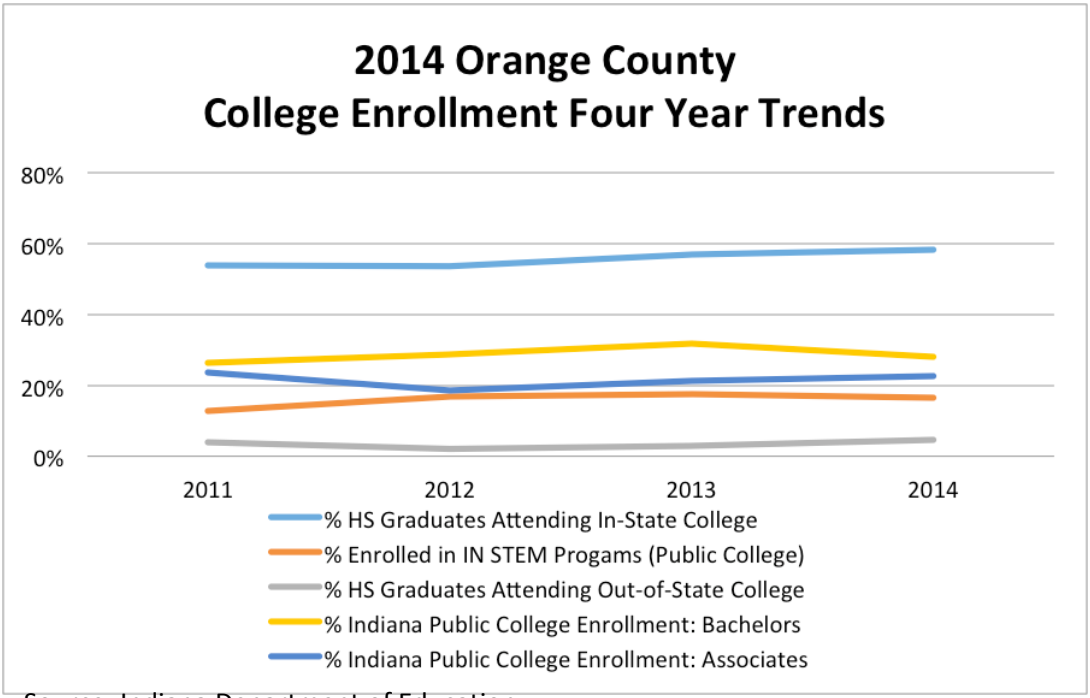
Graduation rates in Orange County reside in the bottom portion of the county. While 2016 marked the first time the county graduated at least 90 percent of their student body, this is still below the average in the region and something worth reviewing. The three school corporations annually maintain a strong 96 percent attendance rate that is consistent with much of the county. Modest increases in all major college enrollment statistics show the county's education potential is growing but still has a large room for improvement. Nearly 40 percent of graduating seniors do not attend college in the county. This is an area that Crane may emphasize with county education representatives to help improve this figure.

Figure 35

Orange County Graduation Rate Trends				
		2014	2015	2016
Female	Cohort Count	129	134	99
	Graduates	115	112	91
	Grad Rate	89%	84%	92%
Male	Cohort Count	149	131	101
	Graduates	131	111	89
	Grad Rate	88%	85%	88%
Total	Cohort Count	278	265	200
	Graduates	246	223	180
	Grad Rate	88%	84%	90%

Orange County Attendance Trends	
2015-16	96.23%
2014-15	95.97%
2013-14	95.97%
2012-13	95.47%
2011-12	95.40%
2010-11	95.87%
2009-10	96.03%
2008-09	95.90%
2007-08	95.93%
2006-07	96.30%
2005-06	96.53%
Average	95.96%

Figure 36



Source: Indiana Department of Education

Sullivan County

Attendance and Graduation rates within the county are consistent with many of the counties adjacent to Sullivan. Graduation rates have improved over the sample period while attendance has been steady at 95% percent. In 2012, Sullivan County school corporations saw a growth of over 10 percent In-State college enrollment. This boost has since been maintained over the next two years. This improvement is encouraging and further represents an opportunity for Crane to direct resources at the higher education level to retain collegiate students.

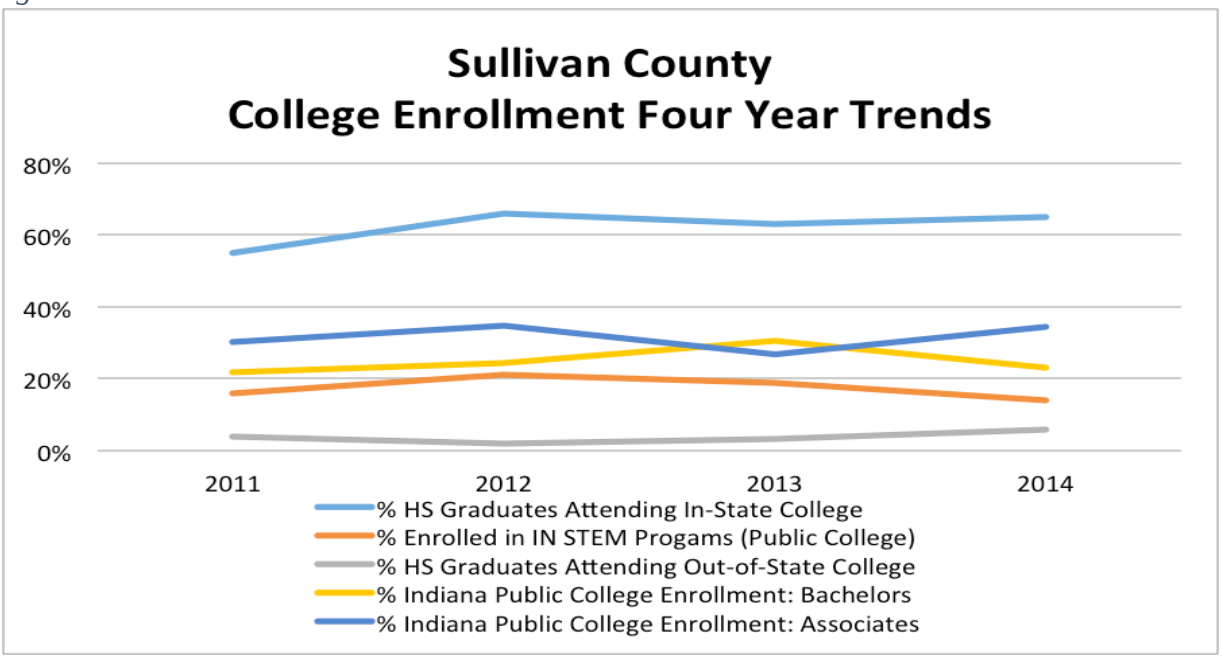
Figure 37

Sullivan County Graduation Rate Trends				
		2014	2015	2016
Female	Cohort Count	119	111	102
	Graduates	102	99	96
	Grad Rate	86%	89%	94%
Male	Cohort Count	110	113	111
	Graduates	97	98	103
	Grad Rate	88%	87%	93%
Total	Cohort Count	229	224	213
	Graduates	199	197	199
	Grad Rate	87%	88%	93%

Sullivan County Attendance Trends	
2015-16	95.80%
2014-15	95.75%
2013-14	95.90%
2012-13	95.50%
2011-12	95.75%
2010-11	95.45%
2009-10	95.15%
2008-09	95.45%
2007-08	94.95%
2006-07	95.35%

2005-06	95.20%
Average	95.48%

Figure 38



Source: Indiana Department of Education

Washington County

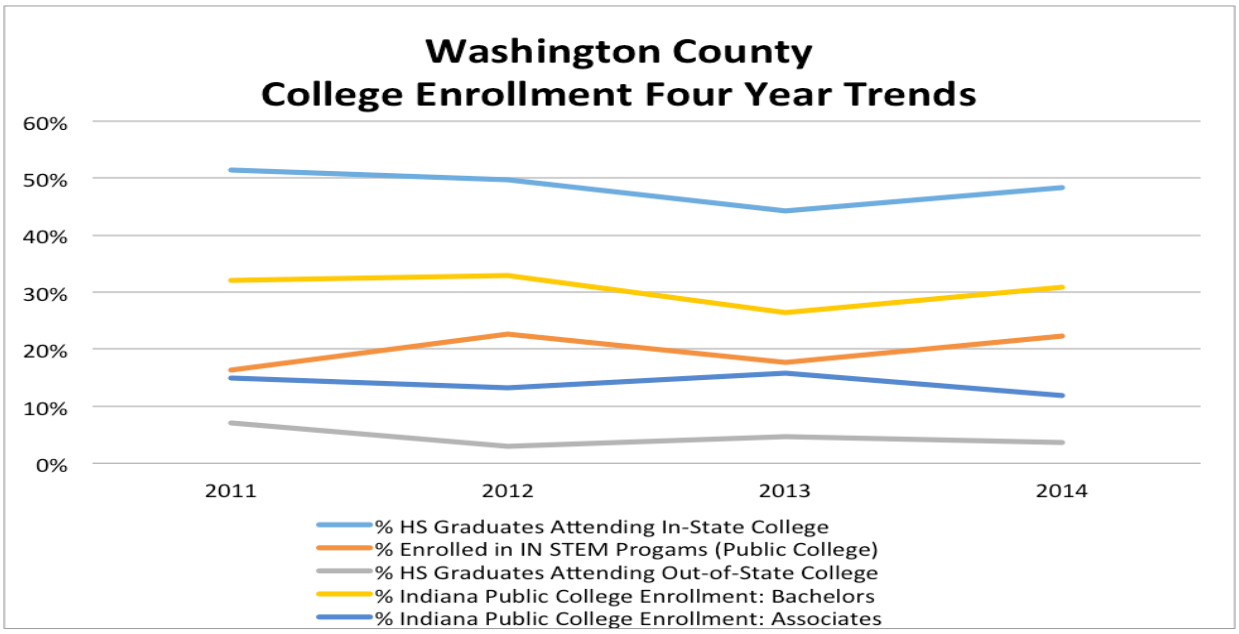
Of the ten-county region influenced by Crane, Washington County represents some of the highest graduation rates 95% and consistent attendance rates at 95% annually. The college enrollment trends in the county show a steady decline leading into 2013. In nearly all statistical categories, 2013 was a low point in college enrollment but 2014 represented a year of recovery and growth. Due to a small, one year sample size, it is difficult to assess if this one year growth in 2014 has sufficiently stymied the declines experienced from 2011 to 2013. These data are worth updating when future Indiana Department of Education statistics are released for the 2015 and 2016 academic years.

Figure 39

Washington County Graduation Rate Trends				
		2014	2015	2016
Female	Cohort Count	180	164	149
	Graduates	175	157	144
	Grad Rate	97%	96%	97%
Male	Cohort Count	187	150	182
	Graduates	174	137	169
	Grad Rate	93%	91%	93%
Total	Cohort Count	367	314	331
	Graduates	349	294	313
	Grad Rate	95%	94%	95%

Washington County Attendance Trends	
2015-16	95.63%
2014-15	95.87%
2013-14	96.10%
2012-13	95.97%
2011-12	96.00%
2010-11	95.60%
2009-10	95.57%
2008-09	95.60%
2007-08	95.57%
2006-07	95.50%
2005-06	95.47%
Average	95.72%

Figure 40



Source: Indiana Department of Education

Recruitment and Retention Strategies

Throughout each county's profile, the emphasis on education growth and the ability to retain the young professionals was central to our research. Each profile addressed the trends in college enrollment and where STEM education fits into the priorities of college freshman. These STEM subject areas are growing in prominence across the counties and offers Crane numerous opportunities to nurture and recruit qualified students.

Through internships and post-graduate positions on base, Crane can deploy strategic, targeted recruiting measures that focus on the universities across Indiana. By following the pipeline from Secondary Education to Higher Education with an emphasis on STEM concentrations, Crane can pay particular attention to sub-populations of young professionals in an effort to curtail the “brain drain” concern in the region. In order to help direct these initiatives on behalf of Crane, a distribution of In-State colleges that high school graduates in the region are attending has been compiled. This distribution, in conjunction with the individual profile listed above, can assist the recruiting initiatives and educational resource allocation by Crane tenants.

College enrollment for the counties mentioned above are listed in the appendix. Important information stood out from the data as outlined below:

- Vincennes University and Ivy Tech Community College on average rank highest amongst the ten counties

    - 74 percent of students attended Vincennes from Martin County, the highest single school destination amongst all ten counties
    - Monroe and Lawrence Counties saw 39 and 37 percent of students attend Ivy Tech, respectively - highest amongst all ten counties
- Besides Monroe County, no county in the region saw more than 11 percent of students attend Indiana University-Bloomington, the flagship institution in the state of Indiana.
    - Dubois County sends the highest percentage of students at 11 percent
    - Sullivan and Crawford Counties are tied for lowest percentage of students at 4 percent
- On average, only 4 percent of graduates in 2014 attended Purdue University.
    - Purdue University annually ranks in the Top 10 for engineering schools
- Varying across counties, Indiana State, University of Southern Indiana and Indiana University – Southeast, each account for a significant proportion of students
    - 35 percent of Washington County students attend Indiana University – Southeast
    - 28 percent of Sullivan County students attend Indiana State University
    - 23 percent of Dubois County students attend University of Southern Indiana
- Four year trends of In-State College enrollment are consistent across all counties
    - Variations of 5-8 percentage points exist from 2011 to 2014
    - Consistent trends allow for targeted, prolonged engagement with school corporations and the universities the students are most likely to attend

Technological Leadership

As this report has discussed, the education and experience of the workforce at NSA Crane firmly establishes its position for technological research, development, and leadership in the region. This section examines the impact of technology at NSA Crane on the surrounding area through discussion of the technology programs and manufacturing on base as well as the support provided externally through partnerships facilitated with NSA Crane's resources.

Technology Transfer Summary

NSWC Crane's mission objectives include: special missions, strategic missions, and electronic warfare. These objectives play a part in "harnessing the power of technology for the warfighter."[45] NSWC employs scientists, engineers, and a number of technicians from diverse areas of expertise that work in the development of technologies. NSWC also employs physical assets as well, including 270 buildings and testing facilities including Lake Glendora Test Facility and a special weapons test range. Utilizing both personnel and physical assets, NSWC has developed and continues to develop sensors, electronics, electronic and special warfare weapons." Research, development, engineering, and support of technologies in these areas are assets that Crane can offer companies located in the state and local communities.

NSWC Crane has identified six areas where they have "key technical capabilities"[46]. They are strategic systems hardware, advanced electronics and energy systems, special warfare and expeditionary systems hardware, infrared countermeasures and pyrotechnics, sensors and surveillance systems, and electronic warfare systems[47]. NSWC Crane uses these technologies to not only help accomplish their core missions of "on-time delivery of ships and submarines" and "cybersecurity" but they also create business partnerships with various organizations to contribute to their "culture of affordability"[48].

With the capabilities and resources mentioned, technology research, development, and commercialization are all possibilities for high-paced economic activity and development. Technology Transfer (T2) is an invaluable program housed at NSA Crane that facilitates the commercialization of technologies and abilities of NSWC Crane through partnerships with external entities. Under authority from Congress, NSWC Crane is allowed to partner with: "private industry, academia, state, local and foreign governments"[49]. The goal of these partnerships is to

[45] Pyne, Brooke. NSWC Crane Technologies. Powerpoint Presentation. February 2017.
[46] NSWC Crane Division: Technical Capabilities . (n.d.). Retrieved from http://www.navsea.navy.mil/Home/Warfare-Centers/NSWC-Crane/What-We-Do/Technical-Capabilities/
[47] *NAVSEA Warfare Centers Technical Capabilities Manual* (Rep.). (2015, July 7). Retrieved http://www.navsea.navy.mil/Portals/103/Documents/Warfare_Centers/WFC_TECHNICAL_CAPABILITIES_Rev6_July7_2015_Final%20Signed.pdf
[48] NAVSEA Commander's Intent. (n.d.). Retrieved from http://www.navsea.navy.mil/Who-We-Are/CMDR-Intent/
[49] NSWC Crane Division Business Partnerships. (n.d.). Retrieved from http://www.navsea.navy.mil/Home/Warfare-Centers/NSWC-Crane/Partnerships/Business-Partnerships/

share Crane's newest technology with the public to leverage it for success on the market place, assisting academic research, or solving a government problem. NSWC Crane currently engages in eight different kind of partnerships shown in the table below as well as engaging in technology transfer programs.

There are a number of agreements that NSWC Crane can utilize with other partners through T2 to expedite the commercialization of technology and to maximize the use of government assets that are available to benefit T2 partners. The variety of agreements are described in figure 41[50].

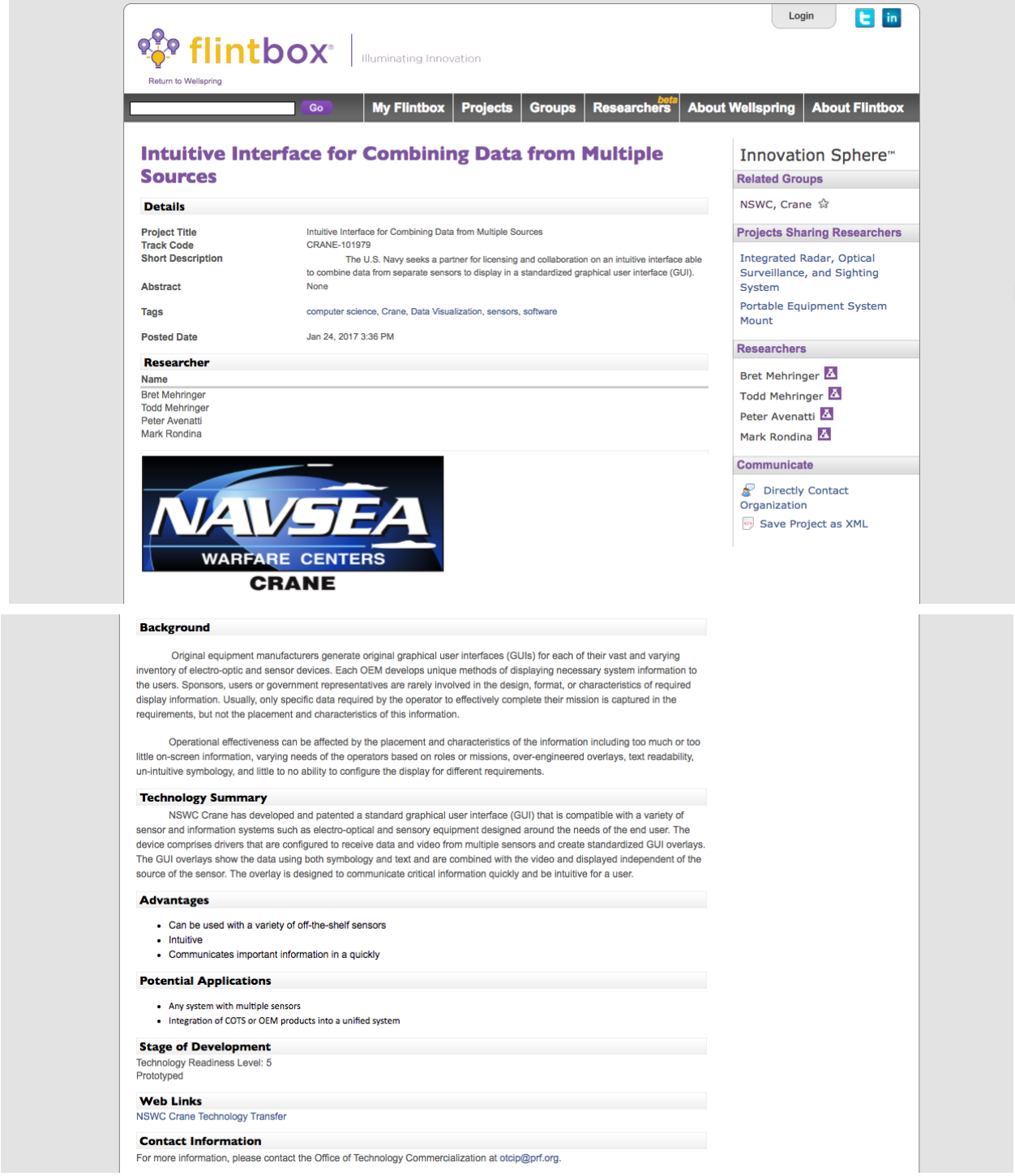
[50] *Ibid.*

Figure 41

Type Of Agreement	Who We Can Partner With	Purpose And Advantage	Description:
Broad Agency Announcement	US or foreign businesses, universities, and individuals	Used for competitive selection of proposals for scientific study and experimentation. Invitation to submit a proposal for R&D.	Provides general description of Navy needs and future requirements; not a formal Request for proposal. May be open up to a year. Contracts may or may not be awarded. Publication in the Commerce and Business Daily.
Work for Private Parties Agreement	Any business, university or private entity	Rapid contract process by whereby unique Crane facilities and personnel can be directly accessed and paid for by a non-profit government customer.	Tasking based on Statement of Work by customer and cost estimate provide by Crane personnel. Approval at local level; not subject to Federal Acquisition Regulations. Requires indemnification and advance or phased payment.
Memorandum of Understanding or Agreement	Any federal government entity, university or business entity	Shoes intent to work together in a partnership or collaborative manner. No funding, contracting or accounting.	A high level agreement documenting and identifying areas of potential collaboration and/or a strategy to do so. Requires approval by senior managers.
Cooperative Research and Development Agreement (CRADA)	Any non-federal government	Joint development and sharing of facilities knowledge, experience and/or intellectual property. Provides data and intellectual property protection from a Freedom of Information Act for an established period of time.	An agreement that provides for joint research and development; however, Crane personnel and facilities cost may be paid for by the non-government partner. Not subject to Federal Acquisition Regulations.
Patent License Agreement (PLA)	Any entity	Commercially exploit patented developed technology. Licensees have competitive advantage for commercialization of a product or process.	Assigns the right to make, use or sell government intellectual property. License fees and/or royalties may be involved.
Small Business Innovative Research Program	Any US small business with Less than 500 employees	Take advantage of special funding set aside by congress to develop innovative solution to Navy problems having a potential for commercial use.	Contracts are phased to permit technology feasibility and demonstration before full-scale development commercialization. Award amounts generally range from $100l to $750k, depending upon phase.
Intergovernmental Personnel Act	State or local government, universities, and qualified non-profit entities	Assigned personnel act as employees of institution to which they are assigned. Promotes intergovernmental understanding and collaboration for mutual benefit.	Personnel temporarily assigned to another organization for 1 to 4 years. Salary may be paid by receiving or assigning organization or the cost may be shared.
Integrated Product and Process Development of Integrated Product Teams	Parties involved in development and delivery of a product or concept.	Empowerment of a team to develop or deliver a product at best cost, schedule and quality that is supportable.	Encourages coordination, communication and innovation for development of new products or technologies for the benefit of all parties.

As of April 8, 2017, NSWC has 157 T2 program project partner requests that any organization can take advantage of. An example of a current T2 project partner requests is featured in figure 42.

Figure 42



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Intuitive Interface for Combining Data from Multiple Sources

Details

Project Title	Intuitive Interface for Combining Data from Multiple Sources
Track Code	CRANE-101979
Short Description	The U.S. Navy seeks a partner for licensing and collaboration on an intuitive interface able to combine data from separate sensors to display in a standardized graphical user interface (GUI).
Abstract	None
Tags	computer science, Crane, Data Visualization, sensors, software
Posted Date	Jan 24, 2017 3:36 PM

Researcher

Name
Bret Mehringer
Todd Mehringer
Peter Avenatti
Mark Rondina

NAVSEA WARFARE CENTERS
CRANE

Innovation Sphere™

Related Groups
NSWC, Crane

Projects Sharing Researchers
Integrated Radar, Optical Surveillance, and Sighting System
Portable Equipment System Mount

Researchers
Bret Mehringer
Todd Mehringer
Peter Avenatti
Mark Rondina

Communicate
Directly Contact Organization
Save Project as XML

Background

Original equipment manufacturers generate original graphical user interfaces (GUIs) for each of their vast and varying inventory of electro-optic and sensor devices. Each OEM develops unique methods of displaying necessary system information to the users. Sponsors, users or government representatives are rarely involved in the design, format, or characteristics of required display information. Usually, only specific data required by the operator to effectively complete their mission is captured in the requirements, but not the placement and characteristics of this information.

Operational effectiveness can be affected by the placement and characteristics of the information including too much or too little on-screen information, varying needs of the operators based on roles or missions, over-engineered overlays, text readability, un-intuitive symbology, and little to no ability to configure the display for different requirements.

Technology Summary

NSWC Crane has developed and patented a standard graphical user interface (GUI) that is compatible with a variety of sensor and information systems such as electro-optical and sensory equipment designed around the needs of the end user. The device comprises drivers that are configured to receive data and video from multiple sensors and create standardized GUI overlays. The GUI overlays show the data using both symbology and text and are combined with the video and displayed independent of the source of the sensor. The overlay is designed to communicate critical information quickly and be intuitive for a user.

Advantages

- Can be used with a variety of off-the-shelf sensors
- Intuitive
- Communicates important information in a quickly

Potential Applications

- Any system with multiple sensors
- Integration of COTS or OEM products into a unified system

Stage of Development

Technology Readiness Level: 5
Prototyped

Web Links

NSWC Crane Technology Transfer

Contact Information

For more information, please contact the Office of Technology Commercialization at otcip@prf.org.

Economic Values of the Technology Transfer Program

The T2 impact spans across the state of Indiana and to the economic development of the region we are evaluating. The Indiana Business Research Center found that for every T2 agreement, three

jobs are created.[51] The average wage associated with NSWC Crane's T2 operation is $64,696. The average taxes collected from CRADA and PLA related activities are approximately $614,000 per agreement. This results in approximately $25 million in taxes generated from the T2 agreements at NSWC. Since the initiation of T2 at NSWC Crane, 300 patents have been issued and 138 jobs have been created. Using this data, a multiplier was calculated to more accurately describe NSWC Crane's economic impact. The total compensation of the new positions created through T2 is approximately $8,928,048.

Additional Technology Efforts

Crane Army Ammunition Activity (CAAA) also works to produce and manufacture technology within NSA Crane. Examples of manufactured materials include pyrotechnic candles, flares, naval smoke and signal devices.[52] CAAA employs approximately 800 individuals and during 2016, invested $22 million in equipment and facility improvements to maintain momentum of the defense industry and to improve workplace opportunities and conditions for CAAA employees.[53] Defense Logistics Agency, another NSA Crane tenant, also provides support to the technology efforts on base. DLA is tasked with "distribution functions associated with receipt, storage, packing, packaging, preservation and marking, and transportation" for materials used on base, specifically materials used by NSWC's engineers and scientists.[54]

Regional Technology Support

There are a number of partners outside of NSA Crane available to support the technological leadership of the region.

- The Indiana Office of Defense Development (IODD) is a champion of the defense capabilities and technologies offered within the state. The IODD works in collaboration with Indiana's defense sector, including tenants of NSA Crane, to grow and strengthen the defense economy and workforce of the state.[55]
- WestGate@Crane Technology Park is a partner providing physical space for technology development and economic growth in the region. The park houses 40 tenants and contributes approximately $36 million in salaries annually. Companies housed at WestGate include: BAE Systems, McKean Defense Group, Greene County Hospital amongst many others. The funding that West Gate receives is determined by income taxes paid. Increases in salaries produced within the park, increases its funding, therefore increasing its ability to provide assistance to technology firms and entrepreneurs.

[51] Indiana University Business Research Center Citation
[52] CDR. Timothy Craddock. In-Class Presentation. January 2017.
[53] Craig, M. (2017, January 13). Investment Keeps Ammunition Activity Moving Forward. *Radius Indiana*. Retrieved from http://www.radiusindiana.com/Radius-Blog/January-2017/Investment-keeps-ammunition-activity-moving-forwar.aspx
[54] DLA Distribution Public Affairs, "Unique mission at Crane supports diverse customer base." May 2016.
[55] http://www.in.gov/iodd/2351.htm

- The Battery Innovation Center (BIC) is another facilitator of technology commercialization, specifically in the realm of energy systems. A tenant of WestGate, BIC's $15.6 million research lab will prove to be an invaluable asset in this sector.[56]
- Stimulus Engineering is another partner in the region working with government agencies to facilitate technology commercialization. Stimulus has partnered with NSWC Crane to assist with Maritime Electronic Warfare efforts.[57]
- Radius Indiana also plays a role in bolstering the technology industry of Southern Indiana. The economic development organization connects businesses with technological resources and opportunities provided at NSA Crane.
- With prominent academic institutions located within close proximity to NSA Crane, academic research efforts are also important to technological leadership within the region:
    - Indiana University provides technology and cybersecurity research through their Pervasive Technology Institute which consists of University of the Mauer School of Law, the School of Informatics and Computing, and a number of other University partners. For example, Indiana University's School of Informatics and Computing has entered into an agreement with Crane based on research centered on artificial intelligence and human-computer interaction.
    - Rose-Hulman Institute of Technology is another partner of technology efforts taking place at NSA Crane with software research and development.
    - The University of Southern Indiana has worked with NSWC Crane since 2009 and has successfully developed programs such as their Technology Commercialization Academy – which has led to the creation of four companies. USI has also been recognized by the Department of Defense for their developed processes regarding intellectual property. The university also does a variety of work with small business and entrepreneurs, acting as a way to connect these business professionals with assets and opportunities at NSWC Crane.
    - Purdue University has an active T2 partnership with NSWC Crane through the Purdue Research Foundation. The university was recently recognized for their efforts for technology transfer.

NSA Crane brings together many innovative minds. Minds from within the gates of the NSA Crane and those throughout the state of Indiana are able to collaborate in research, development, and commercialization processes, leading to an impact throughout the region, the state, and even taking technology developed in Indiana throughout the country.

[56] Battery Innovation Group inks public-private partnership with NSWC Crane. (2016, March 7). *Battery Innovation Center*. Retrieved from http://www.bicindiana.com/single-post/2016/03/07/Battery-Innovation-Group-inks-publicprivate-partnership-with-NSWC-Crane

[57] Electronic Warfare. (2017). Retrieved from http://www.stimulusengineering.com/electronic-warfare/

Environmental Leadership

Crane has been making great contributions to the state of Indiana, especially southern Indiana, in areas of natural resources management, green practices, and outdoor recreation including fishing, hunting, and boating. Crane has worked or created partnerships with governments in adjacent counties and Indiana's universities to manage its natural resources and it has become a leader in environmental stewardship through achievements from those co-workings and partnerships. NSA Crane has made it a priority to maintain their environmental resources and improve sustainable practices by setting up and executing short and long-term plans, monitoring their results, and cooperating with other federal and local governments or institutions. These achievements have economically and environmentally impacted the surrounding counties.

Natural Resources Management

NSA Crane's main site is approximately 62,000 acres where 54,000 acres is forest. The current volume of Crane's forest is 304 million board feet. The types of trees in this forest are typical of the region and are primarily hardwoods, e.g.; oak, hickory, poplar, walnut, etc. This forest provides some of the richest biodiversity in Indiana. NSA Crane has implemented forest management since 1959. NSA Crane has used primarily an uneven-aged management scheme, and as a result of that forest has enhanced biodiversity.

The trees in the Crane's forest provide valuable resources to the local economy. Crane's forests grow 8,350,000 board feet annually; however, only 3,057,761 board feet are harvested per year. This follows Crane's goal of sustainable business practices. Parts of the profits from the sale of timber harvested have been distributed into Martin, Greene, and Lawrence counties in proportion to their portion of Crane's total acreage by the federal law[58]. The total sum of distributed profits to all Indiana counties between the years 2011 and 2015 is $ 795,085. During that time same time period Martin County received $ 754,058, Greene County received $39,118, and Lawrence County received $1,908. These can be regarded as the direct economic impact on these three counties. The total economic impact on Indiana in the processes from harvesting to making final products in every year could be estimated to about $110,446,327 which can be calculated from multiplying total amount of timber harvested (3,057,761) by multiplier ($43) and regional factor (0.84)[59]. This total economic impact is distributed into 10 counties in the proportion of the number of sawmills and veneer mills[60]. As a result, the economic impact distributed into each individual county is

[58] U.S Code, Title 10, Subtitle A, Part IV , Chapter 159, § 2665

[59] The research of Jeffrey Settle, Chris Gonso, and Mike Seidl (2016) suggested that 84% of logs processed in Indiana were harvested in Indiana, and every board foot of timber processed had $43 of economic impact on Indiana.

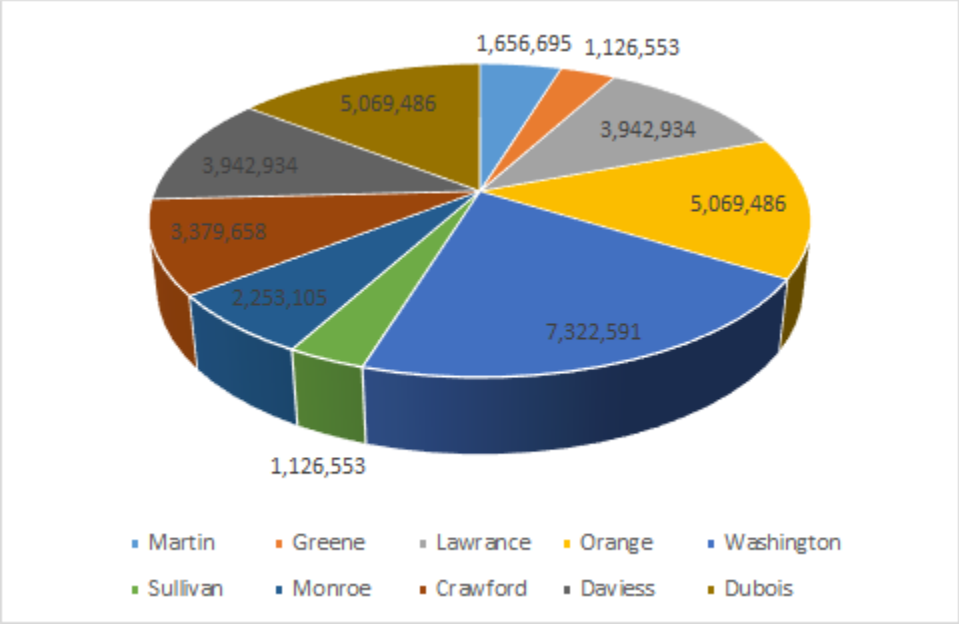
[60] The research of Stephen Bratkovich, et al (2003) presented that 61 mills out of total 196 sawmills and veneer mills in IN ('00) located in Martin(3 mills), Greene(2 mills), Lawrence(7 mills), Orange(9 mills), Washington(13 mills), Sullivan(2 mills), Monroe(4 mills), Crawford(6 mills), Daviess(7 mills), Dubois(9 mills) county.

$1,656,695 for Martin county, $1,126,553 for Greene county, $3,942,934 for Lawrence county, $5,069,486 for Orange county, $7,322,591 for Washington county, $1,126,553 for Sullivan county, $2,253,105 for Monroe county, $3,379,658 for Crawford county, $3,942,934 for Daviess county, and $5,069,486 for Dubois county in every year. These values can be regarded as the indirect economic impact on each individual county yielded by timber harvested in NSA Crane region.

Figure 43

NSA Crane Timber Sales distribution - proportional to their portion of Crane's total acreage							
		94.84%	4.92%	0.24%			
	Total	Martin	Greene	Lawrence			
'92	$215,946	$204,803.19	$10,624.54	$518.27			
'93	$115,373	$109,419.75	$5,676.35	$276.90			
'94	$108,796	$103,182.13	$5,352.76	$261.11			
'95	$379,456	$359,876.07	$18,669.24	$910.69			
'96	$299,728	$284,262.04	$14,746.62	$719.35			
'97	$220,458	$209,082.37	$10,846.53	$529.10			
'98	$39,915	$37,855.39	$1,963.82	$95.80			
'99	$194,255	$184,231.44	$9,557.35	$466.21			
'00	$332,484	$315,327.83	$16,358.21	$797.96			
'01	$532,531	$505,052.40	$26,200.53	$1,278.07			
'02	$396,444	$375,987.49	$19,505.04	$951.47			
'03	$320,535	$303,995.39	$15,770.32	$769.28			
'04	$678,849	$643,820.39	$33,399.37	$1,629.24			
'05	$280,540	$266,064.14	$13,802.57	$673.30			
'06	$293,412	$278,271.94	$14,435.87	$704.19			
'07	$623,968	$591,771.25	$30,699.23	$1,497.52			
'08	$155,020	$147,020.97	$7,626.98	$372.05			
'09	$269,246	$255,352.91	$13,246.90	$646.19			
'10	$339,726	$322,196.14	$16,714.52	$815.34			
'11	$71,374	$67,691.10	$3,511.60	$171.30			
'12	$237,083	$224,849.52	$11,664.48	$569.00			
'13	$119,643	$113,469.42	$5,886.44	$287.14			
'14	$87,158	$82,660.65	$4,288.17	$209.18			
'15	$279,827	$265,387.93	$13,767.49	$671.58			
*reference USC Title 10 SubA Ch 159 Sec 2665							
*paid in proportion to the specific county portion of Crane's total acreage and							
dependent on Navy program cost; fluctuations accordingly.							
*Overall Economic Impact is greater due to contracts/jobs created to conduct timber harvest							

Figure 44



Numerous bodies of water are in NSA Crane's territory, most principally the 820-acre Lake Greenwood, located on the northern portion of the installation and used for potable water, flood control, and recreation. Protection from water pollution has been an important task for NSA Crane because many activities and productions implemented the missions of NSA Crane cause contaminated waste water. So, NSA Crane operates a Class D industrial wastewater treatment plant to control discharges of industrial wastewater pollutants into the sewer system.

While no federally designated critical habitat is found on NSA Crane, the federally threatened Indiana bat has been documented on the installation. Additionally, several species of flora and fauna listed by the Indiana Department of Natural Resources (INDNR) as endangered, rare, or species of concern have been documented on the installation. The conservation of these rare species is important, so NSA Crane has been committed to working with the U.S Fish and Wildlife Service (USFWS) and INDNR to preserve these species on the installation. Especially, NSA Crane established and has implemented the Integrated Natural Resources Management Plan (INRMP, 2010~2019) which include the plan for monitoring, implementing preservation for those species.

Green Practices and Sustainability

NSA Crane has implemented green practices in compliance with federal regulation, Executive Order 13693, Planning for Federal Sustainability in the Next Decade. This order introduced new requirements and expands upon requirements established by EO 13514, EO 13423, the Energy Policy Act of 2005, and the Energy Independence and Security Act of 2007. NSA Crane has implemented various policies, like greenhouse gas emissions reduction, energy conservation, water management, sustainable acquisition, and etc.

In alignment with these objectives, NSA Crane partnered with Duke Energy, one of the country's largest energy providers to host Indiana's first large-scale power plant. The 145-acre plant developed between the Department of the Navy and Duke Energy, is comprised of 76,000 solar panels providing enough energy for 2,700 homes. In the case of power outage at NSA Crane, the solar plant has the ability to reroute power throughout the base to maintain operational activity. This would result in $125,086.50 per hour of worker productivity saved for the 10-county region, in addition to the energy cost-savings from the solar energy itself.

NSA Crane has implemented the land management scheme to secure the sustainable development of NSA Crane. To achieve this goal successfully, NSA Crane is divided into 39 natural resource use area to allow areas to be opened and closed as necessary to separate types of activities. Lakes and ponds in NSA Crane territory are divided into four units to manage efficiently: Lake Greenwood, Boggs Creek Small Watershed Project, Lake Oberlin, and Wildlife. It has designated special management areas to protect and provide habitats for rare species and safety for human. In 2016, NSA Crane and local communities, Daviess county, Greene county, Lawrence county, Martin county, and Sullivan county had worked jointly land use study to protect the viability of current and future military mission and operations, while simultaneously guiding community growth, sustaining the environmental and economic health of the region. NSA Crane has been and will continue to implement actively the recommendations of the joint land use study (JLUS) with other regional institutions.

Wildlife and Recreation

Wildlife-related recreational activities include fishing, hunting and wildlife watching. A survey in 2011 estimated "that Americans spent $145 billion on related gear, trips, licenses, land acquisition or leases, and other purchases, representing about one percent of the nation's gross domestic product".[61] It also asserted that thousands of jobs had been generated, local communities supported and vital funding for preservation provided that made wildlife-related recreation become one of major driver of the nation's economy.[62] The 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation for Indiana estimated that "in 2011, state residents and nonresidents spent $1.7 billion on wildlife recreation in Indiana. Of that total, trip-related expenditures were $699 million and equipment expenditures totaled $786 million. The remaining $208 million was spent on licenses, contributions, land ownership and leasing, and other items". These expenditures derived from consumption of trip-related expenses (food, lodging, transporting) and other trip expenses (equipment for these activities). "For fishing, expenditures for food and lodging were $140 million and transportation expenditures were $137 million. Other trip expenses, such as equipment rental, bait, and cooking fuel, totaled $150 million. Each angler spent an average of $527 on trip-related costs during 2011. For hunting recreation, hunters spent $18 million on auxiliary equipment (tents, special hunting clothes, etc.) and special equipment (boats, vans, etc.), accounting for 17 percent of total. The purchase of other items, such as

[61] Dan Ashe, 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation—Indiana
[62] *Ibid.*

magazines, membership dues, licenses, permits, and land leasing, and ownership, cost hunters $52 million - 24 percent of all hunting expenditures. Wildlife-watching participants spent nearly $478 million on equipment—64 percent of all their expenditures. Specifically, wildlife-watching equipment (binoculars, special clothing, etc.) expenditures totaled $311 million, 65 percent of the equipment total. Auxiliary equipment expenditures (tents, backpacking equipment, etc.) and special equipment expenditures (campers, trucks, etc.)".[63] The recreational activities described bring about opportunities for developing industries such as food, lodging service, and equipment.

While the contribution of this recreational sector to Indiana is still limited ($ 1.7 billion compared to total aggregation around $ 300 billion of the state), it plays an important role in economic development in 5 surrounding counties of the NSA Crane since these activities help in securing about 10-15% of jobs in each county.

Figure 45

Jobs by industry in 5 Surrounding Counties [64]

County	Jobs, Agriculture, Forestry, Fishing and Hunting, and Mining	Arts, Entertainment, and Recreation, and Accommodation and Food Service	Total Jobs Percentage
Daviess	7.7	5.8	13.5
Greene	4.5	5.8	10.3
Lawrence	1.5	9.3	10.8
Martin	6.3	8.1	14.4
Sullivan	8.1	6.4	14.5

Moreover, by providing opportunities for on-site golfing, fishing, and controlled hunting, NSA Crane and its tenants play an important role in the community. In addition, these kinds of social and recreational activities are significant factors contributing to quality of life for many young people and workers more than simply high quality housing. This can help surrounding counties of NSA Crane to retain and attract stable workforce.

Wildlife Preservation

"NSA Crane encompasses a major area of contiguous forest in Indiana, with 50,578 ha (83%) of forest. The forest matrix consists largely of oak-hickory timber, mixed hardwoods and bottomland hardwoods. Forest stands have been managed using a variety of silvicultural techniques, particularly an uneven-aged management scheme. NSA Crane is listed as an Important Bird Area with over 3000 acres of wetland habitat, including Lake Greenwood and the extensive marshes of Lake Gallimore. These land characteristics, combined with a successful integration of natural resource management with military mission, have resulted in excellent habitat for a variety of

[63] 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation - Indiana
[64] The table reproduced from data on Public Draft of Background Report of NSA Joint Land Use, Nov 2016

wildlife. Aside from supporting significant neo-tropical migrant bird populations, NSA Crane is inhabited by other animal taxa of importance, including the federally-endangered Indiana Bat. The Institute for Bird Populations conducted a MAPS study at Crane from 1994 – 2002 and 2004 – 2008. They have detected a total of 120 species, 79 of which are known to breed on the installation, and 41 species that are passage migrants or out-of-range transients. Given the timber management policies developed at the facilities, the Crane Division has been established as a model Natural Resources Conservation Program for the Navy and the Department of Defense, as recognized by Indiana State Legislature". [65]

In addition, there are 27 species found on base that are listed on the state endangered species list; this includes 6 other species of bats, 2 species of shrews, the bobcat, the river otter, 2 species of snakes, and 15 species of birds.[66] Because of this, the base is required to take extra precaution of these species when carrying out operations and works with the Indiana Department of Natural Resources to manage its biological resources. Federally endangered species found on base include a variety of mollusks and bats.

Cultural Resources Management

In 2015, the NSA Crane received Chief of Naval Operations Environmental Award, an award recognizing efforts to promote cultural resources stewardship by highlighting outstanding examples of Cultural Resources Management. "The CR Program at NSA Crane is responsible for locating, evaluating, protecting, and managing the myriad of cultural resources at this large installation, including; 2 historic districts (49 structures), 2 stand-alone historic structures, 78 archaeological sites, and 28 pioneer era cemeteries". [67]

[65] *Establishing Regional Mentor Sites for the Management of the Cerulean Warbler and other Mature Forest Avifauna* (Rep.). (2015, March). Retrieved http://www.denix.osd.mil/nr/priorities/birds/technotes/establishing-regional-mentor-sites-for-the-management-of-the-cerulean-warbler-and-other-mature-forest-avifauna-case-studies-legacy-13-634/

[66] The table reproduced from data on Public Draft of Background Report of NSA Joint Land Use, Nov 2016

[67] 2016 – Secretary of Defense Environmental Award Nominee Cultural Resources Management – Large Installation Naval Support Activity Crane

Figure 46

NSA Crane - Cultural Resources Program Accomplishments FY14 – FY15[68]	
861	Project Reviews
413	Programmatic Agreement Exemptions
15	SHPO Consultations
6	AR Surveys (237.08 acres)
1	Hist. Bridge Evaluation/Study
26	New Employee Orientations
2	Earth Day Presentations
2	SHPO Year End Reports
2	DEPARC Data Call Reports
1	Chapel Farewell Program
5	GPR Cemetery Surveys
17	Historic Building Surveys
---	Numerous VIP Visits, Tours, & Cemetery Visits
1	Burial at Salem Cemetery
2	Year End Exempt Findings Reports to SHPO
1	Pioneer Era Gravestone Replacement

In the two fiscal years 2014 and 2015, there were 861 separate projects reviewed by NSA Crane's culture resource program to assess impacts of these projects to historic or cultural resources. There were 413 reviewed projects meet Programmatic Agreement which help avoiding length process review in consultations. Therefore, it expedites planning process and lowers the cost of project implementation

By 2015, there were 230 acres for archaeological resources had been analyzed by NSA Crane then specified 112 of those acres were proactive".[69] This survey help in mitigating related expenditures or avoiding postponement of future development in this area. In addition, the cultural resources program at NSA Crane also spurs involvement of organs under the NSA Crane and creates an intimate connection among these entities with the Navy's installations and the history of southern Indiana, resulting in active responses and stewardships from its community towards resource preservation.[70]

[68] *Ibid.*
[69] *Chief Naval Operations Environmental Award Winners Recognized* (Rep.). (2016). Retrieved http://greenfleet.dodlive.mil/files/2016/09/Sum16_CNO_Award_Winners.pdf
[70] *Ibid.*

Next Steps

The above sections showed the current situation of Crane in term of current impact, education impact, community outreach, environmental and technology impact. In this section, we will analysis the strategies that Crane can do to maximize the potential economic and social impact of Crane on the region. This section will include 4 main parts: the first part will focus on universities spillover effects and the concept of bringing in logistics companies to take advantage of I69; the second part is a cluster based analysis for each county and then we can suggest what industries that Crane should invest in, the third part will analyze potential for Crane to improving new technologies and the last part will analyze human capital and strategies to improving human capital in Crane.

The regional economic development has attracted the attention from the researchers, the leaders and regional planners. The regional economic development strategies are important from the national to state and local levels. To achieve sustainable development outcomes and growth, Robert J. Stimson et al (2006)[71] figured out that to achieve the long-term regional economic development there is a need for balance of policies and strategies to all of these problems:

- A focus on increasing productivity;
- Competitiveness and reductions in inputs to production;
- Movement and logistic systems;
- The reduction and reuse of wastes;
- Greater stretch and leveraging of resources;
- The development of demand-driven, export-focused economies.
- The development and maintenance of social, cultural and knowledge capital;
- Risk management; and
- Improved governance.

Within the limit of this report, we will analyze the strategies that Crane can apply to:

- Expanding spillover effects from Indiana University and I69
- Location quotation analysis and strategies for managing the economic downward
- Improving technologies
- Improving Human capital

Data Collection

The data collected for this report come from numerous sources that each have their own method and procedure for how that data is processed and utilized. For our research, we were interested in aggregating regional educational and economic data. Once collected the data will provide the counties associated with NSA Crane a clear understanding of the economic impact at multiple

[71] Robert J. et al., 2006. Robert J.Stimson, Roger R.Stough, Brian H.Roberts. Regional Economic Development: Analysis and planning strategy (2006).

levels. A road map of how their individual communities and counties benefit from this naval base each and every day. According to an interview with former Lieutenant Governor and current Radius Indiana President Becky Skillman from 2015, "With procurements of more than a billion dollars of products and services annually, salaries and benefits of $326.6 million per year in the Radius Indiana region alone, more than $2 million a day pours into Indiana's economy, NSA Crane is an economic powerhouse for this region." Having such an economic impact on the south central Indiana region is why I suggest that a multifaceted database be created and maintained to easily track and report the economic impact of this base. This database can be broken down into three primary fields of collection.

Education Relational Factor

The counties surrounding the Crane base can benefit economically from their proximity to both the NWSC Crane base and Indiana University in Bloomington. Research from David Audretsch et. al. suggests that research universities create "knowledge spillovers" that are attractive to prospective companies.[72] While Indiana University's lack of an engineering program may limit potential technology partnerships with Crane, human capital spillovers can be leveraged for economic development in the surrounding counties. The presence of I-69 improves the possibility of spillovers by cutting down on travel time thereby enhancing proximity to Bloomington. To the extent that Crane can create and nourish human capital connections with Indiana University, the region can benefit.

The spillover effects from the NWSC Crane base stand to benefit the region to a greater degree than Indiana University because of geographical proximity. As outlined elsewhere in this analysis, Crane boasts advanced technology and highly educated human capital. These features of Crane can be leveraged to attract private firms to the region, as is happening at the West Gate campus. It has been pointed out by the Brookings Institute that the Department of Defense "can better solve battlefield challenges by taking greater advantage of regional clusters of knowledge flows, specialized workers, and dense supply chains."[73] If this is indeed true, then it is imperative for the future of NWSC that the Crane region continue to develop as a "regional cluster" that utilizes the technology and human capital provided by Indiana University and NWSC. Developing as a regional cluster necessitates attracting private firms to the area. The growth of these partnerships stands to accelerate as Crane's reputation as a regional cluster continues to develop.

Crane can consider its economic development impact as similar to that of a university. NWSC Crane and Indiana University each employ large numbers of people and act as research hubs. The economic impact of either institution is difficult to ascertain because of the inherent difficulty in establishing a counterfactual for such a large and enduring institution. Crane and IU both attract some number of "ancillary businesses that demand a skilled workforce," but in order for the region

[72] Audretsch et al., 2005. D. Audretsch, E. Lehmann, S. Warning. University Spillovers and New Firm Location. Research Policy, Volume 34, Issue 7 (2005). pp. 113-1122

[73] Andes, Scott. Maximizing the Local Economic Impact of Federal R&D. Brookings. 2015. https://www.brookings.edu/research/maximizing-the-local-economic-impact-of-federal-rd/

to directly benefit, the local labor force must be able to attain jobs at these ancillary businesses.[74] Jobs in industries ancillary to Crane are likely to be high-skill because of their technological nature. Firms that Crane attracts to the area may employ highly paid skilled workers, but without deliberate efforts to build job pipelines, these jobs will predominately go to workers who move to Crane from outside the region. As in the case of universities, "Only incremental earnings of local residents" should be counted when analyzing the employment impact of NWSC Crane.[75] For these reasons, apprenticeships and employment pipelines for local students should be a focus of Crane's economic development plans.

The relative lack of development in the counties surrounding Crane can actually be used to the advantage of economic development efforts. The area features a low cost of living and land acquisition costs are low; both of these features are attractive to prospective firms. In addition to attracting technology-centric firms that can benefit from proximity to NWSC, Crane should consider marketing the area to logistics firms. Transportation, distribution, and shipping companies may be a natural fit for the Crane region because of the cheap land and immediate access to the new and lightly used I-69. Interstate 69 represents a huge potential benefit to the region's economic base, but we feel that I-69 is currently under-utilized as a lure for private firms. Trucking firms and warehouse distribution centers can both benefit from the region's low labor and land costs. Additionally, job pipelines for trucking and logistics would be easy to foster because these industries have a relatively lower demand for advanced degrees.

Location Quotient Analysis

One of the primary tasks of this report is to offer viable avenues for future economic development for the neighboring communities of Crane; especially during periods of economic fluctuation. It is undoubtable that Crane serves as an economic catalyst for the region surrounding the military installation. In periods of economic distress, the situation may arise when Crane must reduce expenditures into the local economy. This scenario could consequently lead to potential economic distress in the surrounding economic region. To diminish the negative economic impact of this scenario on the region, it is important for the local communities to diversify their economic base to avoid solely relying on the influence of Crane for economic stability in the region. The important first step to diversify the economic base, is to review the current economic strengths of the region.

A highly useful approach in reviewing the current economic trends of the specified region is via a location quotient (LQ) analysis. An LQ analysis approach is enlisted to review employment and industry data for the region in comparison to the rest of the nation. The results of the analysis will illustrate the specific subsectors that each specified county holds as an economic strength. LQ's are ratios that compare a specific geographical region's distributional share of employment in a subsector in comparison to a specific base geographical region's distributional share of

[74] Siegfried, et al. 2007. J. Siegfried, A. Sanderson, P. McHenry. The Economic Impact of Colleges and Universities. Economics of Education Review, Volume 26, Issue 5 (2007). Pp. 546-558.
[75] Siegfried, et al. 2007. J. Siegfried, A. Sanderson, P. McHenry. The Economic Impact of Colleges and Universities. Economics of Education Review, Volume 26, Issue 5 (2007). Pp. 546-558.

employment in the same subsector. Essentially, employment figures for a single subsector or industry are isolated for both the targeted and base geographical regions. The employment figures are then calculated as a percentage of total employment for both the targeted and base geographical regions. The targeted region's percentage of employment in the specific subsector is then divided by the base region's percentage of employment in the specified subsector. The resulting ratio figure is set at a base figure of 1. If the targeted region's subsector LQ figure is greater than 1, then that subsector holds a larger share of area employment compared to the base. If the targeted region's subsector LQ figure is 1, then it holds an equal share of area employment in comparison to the base region's percentage of employment in the subsector. Consequently, an LQ below 1 indicates that the targeted region's share of employment in the subsector is below the base region's percentage share of employment in the subsector.[76] LQ's can be utilized to identify key industry subsectors within each county. These subsectors can be used to target specific economic development efforts in each county in accordance with industries that they presently hold as an economic strength.

Utilized Data

The specific data employed in this analysis are produced by the Bureau of Labor Statics (BLS) via their Quarterly Census of Employment and Wages program (QCEW). The base data is published as annual figures, and is available for download form the BLS website.77 The QCEW organizes employment information accordingly with the North American Industry Classification System (NAICS) coding identification numbers. This comprehensive coding system encompasses 20 specified economic sectors, then is broken down into various subsectors and finally into specific industries. More information about the NAICS coding system can be reviewed in the 2017 publication from the Office of Management and Budget.78 The analysis looked specifically at NAICS 3-digit coding for private industry subsectors for each individual county, except Martin County. Due to the predominance of Crane and the Hoosier National Forest within the county, private industry subsectors are not as representative of private employment operations as the other 9 counties. For this reason, NAICS 4-digit coding for specific private industries, rather than subsectors, was utilized for Martin County. Private industry subsectors were chosen as the key variant as analysis to exclude the impact of government employment. Since the primary point of this analysis is to provide insight about potential development opportunities for the counties during an economic downturn, it is prudent to exclude industry subsectors directly reliant on Crane. It is assumed that the private industry subsectors would still indirectly impacted by economic factors affecting Crane, but the results should be less severe.

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[76] "Quarterly Census of Employment and Wages: QCEW Location Quotient Details." Bureau of Labor Statistics. Bureau of Labor Statistics, n.d. Web. 1 Apr. 2017. https://data.bls.gov/cew/doc/info/location_quotients.htm

[77] "Quarterly Census of Employment and Wages: QCEW Data Files." Bureau of Labor Statistics, n.d. Web. 1 May 2017. https://www.bls.gov/cew/datatoc.htm#NAICS_BASED.

[78] United States. Executive Office of the President. Office of Management and Budget. North American Industry Classification System. United States, 2017. N.p.: n.p., n.d. Web. 2 Apr. 2017. https://www.census.gov/eos/www/naics/2017NAICS/2017_NAICS_Manual.pdf.

Methodology

In review of the subsector data for each individual county, annual average employment LQ's were the principal target of the analysis. In review of the LQ figures, the five highest private industry subsector LQ's were isolated for each county for 2015. These five subsectors were then reviewed over a 5-year period, from 2011 – 2015. This year range was chosen to encapsulate economic trends occurring in the counties prior to and post construction of Interstate 69: the first expansion of the interstate to the specified region opened on November 19, 2012.79 It should be noted that there was not available data for certain targeted subsectors over this time period. If data were unavailable, then the subsector was excluded from the final results. For this reason, certain counties will have fewer than five subsectors highlighted in the results. It is also pertinent to reverberate that all subsectors are strictly private subsectors, so the resulting subsectors would not have direct government ownership or management. The results may not be the assumed predominant economic subsectors for a given county.

Results

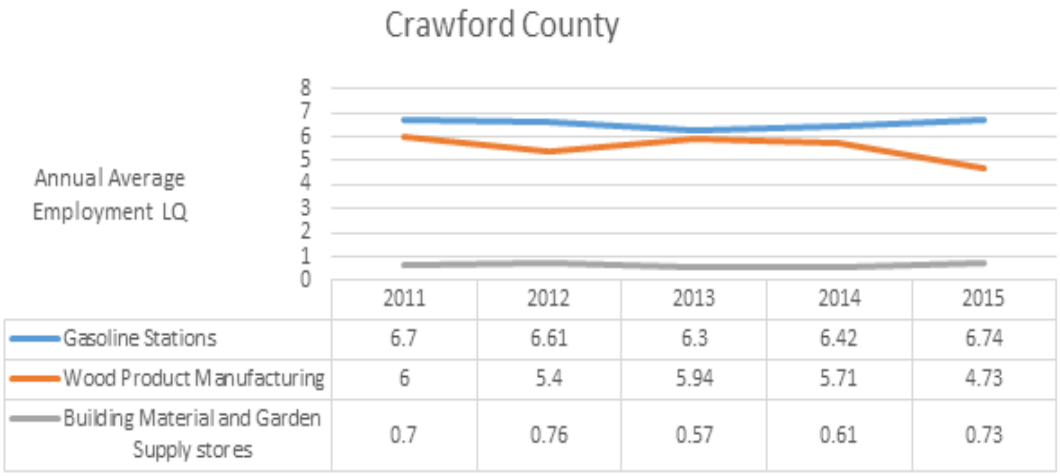
The report will only specifically highlight a select few counties and regionally calculated figures. All other remaining county results not specifically mentioned in this section are included in the appendix.

Crawford County

The first county presented in the results section is Crawford County. This county has three private subsectors included in Figure 47, utilizing the NACIS 3-digit coding subsectors. The two strongest identified subsectors are Gas Stations and Wood Product Manufacturing. Using this information as an example, the employment LQ figure for Gas Station subsector in 2015 is 5.74 times more concentrated in Crawford County than in the US as a whole. This is an important factor to consider for officials in Crawford County when considering future development. It would be wise to target businesses that require similar skill sets and organizational knowledge as is required for businesses in the Gas Station subsector. Critical skill sets held by individuals in this subsector may include: customer service, quality control, or inventory management.

[79] Evans, Tim. "New Stretch of I-69 Opening, Unconnected to Rest of Road." USA Today. USA Today, 19 Nov. 2012. Web. 2 Apr. 2017. https://www.usatoday.com/story/news/nation/2012/11/19/indiana-interstate-69-opening/1713739/.

Figure 47

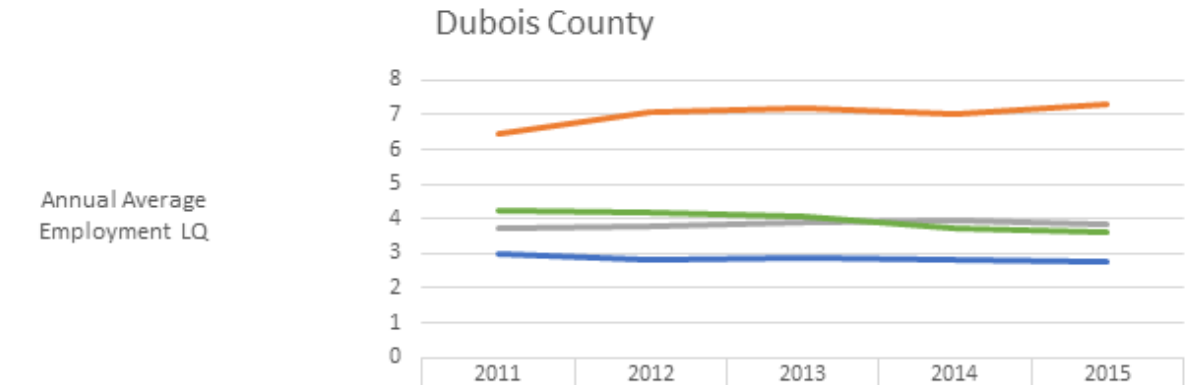


	2011	2012	2013	2014	2015
Gasoline Stations	6.7	6.61	6.3	6.42	6.74
Wood Product Manufacturing	6	5.4	5.94	5.71	4.73
Building Material and Garden Supply stores	0.7	0.76	0.57	0.61	0.73

Dubois County

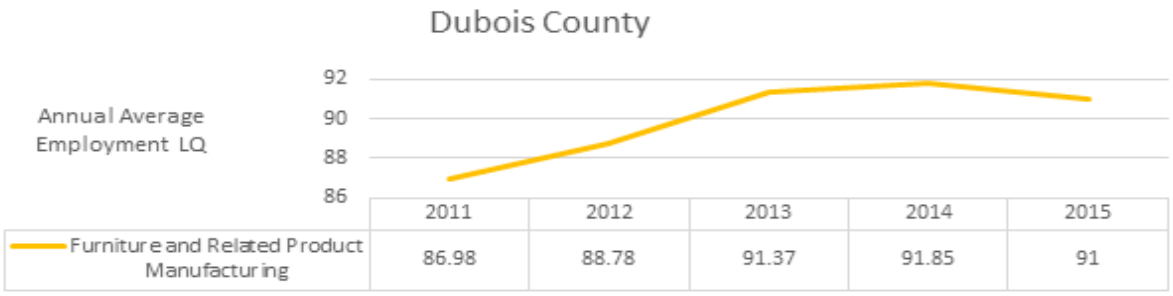
The subsequent county presented in the results section is Dubois County. This county has five private subsectors included in Figure 48 and Figure 49, utilizing the NACIS 3-digit coding subsectors The Furniture and Related Product Manufacturing subsector is presented in a separate table due to its above average LQ figure. Dubois County clearly holds a significant strength in this private industry subsector.

Figure 48



	2011	2012	2013	2014	2015
Animal Production and Aquaculture	6.46	7.05	7.18	7.02	7.32
Food Manufacturing	3.72	3.78	3.92	3.98	3.82
Truck Transportation	3	2.83	2.87	2.81	2.75
Wood Product Manufacturing	4.21	4.2	4.09	3.7	3.61

Figure 49

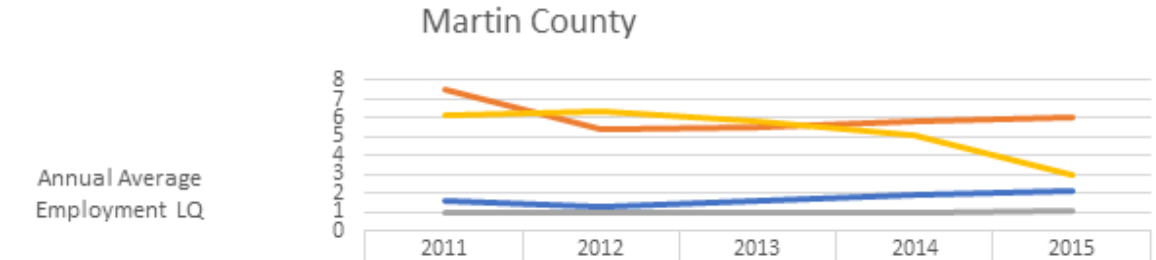


	2011	2012	2013	2014	2015
Furniture and Related Product Manufacturing	86.98	88.78	91.37	91.85	91

Martin County

The third county presented in the results section is Martin County. This county has four private subsectors included in Figure 50, utilizing the NACIS 4-digit coding industries. Please review the above discussion regarding the isolated changing in NACIS coding used for Martin County. Reviewing the current trends, Martin County should concentrate development efforts within the *Architectural and Engineering Services* industry. This specific industry shows an increasing trend over the past 4 years.

Figure 50



	2011	2012	2013	2014	2015
Architectural and Engineering Services	7.55	5.41	5.54	5.82	6.08
Civic and Social Organizations	0.99	1.01	1.01	1	1.06
Computer Systems Design and Related Services	6.1	6.33	5.86	5.09	3.02
General Freight Trucking	1.59	1.35	1.59	1.88	2.17

Regional Figures

Calculating the Location Quotients

This analysis expanded further to produce LQs for the entire 10 county region. These figures were produced using only 2015 BLS data from the counties in the target region. The analysis once again looked specifically at NAICS 3-digit codes for private industry subsectors. The primary factor that would be examined is the annual average employment figure for each industry subsector. To determine the specific industry subsectors that would be included in the analysis, the data was

filtered to isolate the industry subsectors that had reported figures within each county. It should be noted that only 1 industry subsector was reported among all 10 counties, the remaining listed industry subsectors were reported in at least 9 of the 10 counties. Having established the list of targeted industry subsectors, the total average employment amount for each subsector was calculated. The total annual average employment amount for each industry subsector was then divided by the total annual average employment amount for all industries in all 10 counties. The resulting figure represents each industry as a percentage share of total annual average employments for all 10 counties in the region.

Having produced the figures for the target region, the same process was conducted in calculating the base region. The base region for the analysis is the United States. The same specified industry subsectors were reviewed. The national total annual average employments figures for each subsector were collected, and then each value was individually divided by the total annual average employment figure the entire country. This once again produced values that represent each industry subsectors percentage share of total annual average employments for the base region. The final step consisted of dividing the 10-county region percentage figures by the national calculated figures. The resulting values are industry subsector LQs for the entire 10 county region.

Results

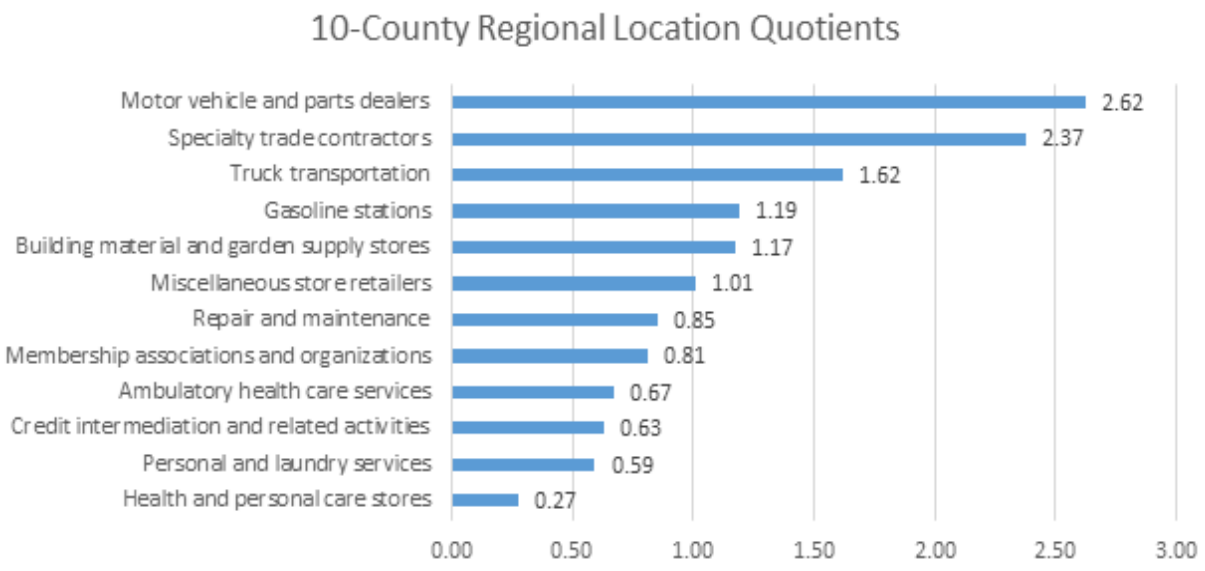
The results of the analysis are presented below in Figure 51. As can be seen from this figure, 6 industry subsectors have a higher aggregate concentration of annual average employments within the 10-county region than in the US as a whole. The general inferences that can be drawn from these values is akin to the discussion presented for the individual counties. These figures represent private industry subsectors that are not directly owned or operated by any form of government. They identify niche industry groups for future human capital development and investment. Concentrating development efforts in industries that require the same or similar employments skill sets as the identified industry subsectors is a viable method in avoiding negative economic impacts when Crane must reduce expenditures in the region.

The significant difference between the individual county analyses and the 10-county regional analysis is that the calculated LQs can serve as an economic development guide for the entire region, rather than individual counties alone. Strategically planning economic development efforts on a regional scale allows communities the opportunity to coordinate their efforts. This holds the potential to reduce the input costs necessary for economic development initiatives while maximize the return on investment of public efforts.

For example, the identified industry subsector *Specialty Trade Contractors* primarily employs individuals that perform auxiliary construction functions; such as plumbing, electrical work, or pouring concrete. Employment in this field is 137 time more concentrated in the 10-county region on average than the rest of the country. Communities in the region can leverage their efforts in economic development initiatives that directly promote the skillsets of individuals in this industry subsector. Knowing that there will likely be increased construction in the region surrounding the I-69 development, communities could focus on implementing strategies to ease development in

the region. This could include reducing the number of steps in planning and permitting process, increasing the available data for site selection, and further expanding business outreach efforts. These options represent one optional method in further promoting this specified category of labor within the region.

Figure 51



Physical Capital Database

First is the collection of information in the creation of an infrastructure database. With the recent completion of the I-69 technology corridor, this region is now more easily accessible to the 12,000 plus truckloads of materials and supplies that flow in and out of NSA Crane annually. While the base has always been strategically located, it has not always been easily accessible to those providing critical support services. This new infrastructure database will track the installation of new roads and structures, such as increasing utility capacities, as they come online. Providing the counties in which they were built with easy access to the capital building and infrastructure improvements in their respected areas.

For instance, the creation of the Battery Innovation Center or Westgate at Crane can both be logged as infrastructure improvements and accounted for as such, given the tax revenues and increased land value associated with the implementation of these facilities. As more technological and support firms come online the increase in overall infrastructure will continue to grow. In the end providing the communities, in which they reside, with continued improvement to their overall infrastructure inventories. This growth is exponential and will continue to advance as the technologies being utilized by the base continues to develop and expand into the next generation of military innovations. This transfer of knowledge from the military to general population application leads me to the next point of data collection.

Economic Impact of New Technologies

Technology and its continued innovations will continue to allow this area to grow and expand into the next century. With the increasing number of Product License Agreements (PLAs) between the government and private technology firms there must be a way to not only track these agreements but associate a value to them that is attributable to long term economic impact of the region. NSA Crane must maintain and track these positive attributes by county that will once again provide data to these local municipalities exemplifying NSA Crane's positive economic impact. Currently, NSWC Crane has 19 active Patent License Agreements (PLAs), 36 active Cooperative Research and Development Agreements (CRADAs), and 97 other agreements with private industry partners and academic institutions.[80] NSWC Crane's most recent licensing partners are all Indiana based companies with plans to transfer technology (T2), out of the federal lab and into the commercial market. For all licenses, active between 2000 and 2014, NSWC Crane contributed to the total economy-wide impact in the amount of $34 million in output and $16 million in value added. Output includes the total value of purchases by consumer products containing government licensed technologies. Value added is the difference between sale price of a product and the cost to produce the product. In addition, the second and third order affects will only increase as more technology companies require an increase in supplies and services. NSWC Crane's license agreements resulted in 138 jobs created or retained and $9 million in labor income, with an average wage of $64,696 per job. As a comparison, the Indiana annual mean wage in 2015 was $42,070 as reported by the Bureau of Labor Statistics.[81]

Tracking these PLA's and their associated revenues, which capitalize on the individual ideas as they come to fruition, is another economic impact that is not currently being tracked and provided to local communities in the region. To date these agreements have generated tens of millions of dollars in revenues from the development and application of these technologies use within the general population. Items such as night vision and recreational drone technologies are byproducts of the advanced technological capabilities originally produced by the military and integrated into civilian products. With the improved infrastructures now in place these technology firms will continue to build facilities along the I-69 corridor providing long term economic stability to the south-central region of Indiana. Duane Embree of the Indiana Department of Defense (IODD) added, "New assets such as the Westgate at Crane Technology Park and the I-69 technology corridor demonstrate imminent growth around NSA Crane."[82] This was the goal of the I-69 project when the expansion was first developed almost twenty years ago. The cost to acquire land was low and the workforce was available due to the relocation of manufacturing jobs that previously

[80] "NSWC Crane Fosters Economic Growth in Indiana Through T2 License Agreements", By NSWC Crane Public Affairs | February 07, 2017 http://www.navsea.navy.mil/Media/News/Article/1074351/nswc-crane-fosters-economic-growth-in-indiana-through-t2-license-agreements/ last visited February 15, 2017

[81] "NSWC Crane Fosters Economic Growth in Indiana Through T2 License Agreements", By NSWC Crane Public Affairs | February 07, 2017 http://www.navsea.navy.mil/Media/News/Article/1074351/nswc-crane-fost ers-economic-growth-in-indiana-through-t2-license-agreements/ last visited February 15, 2017

[82] Inside Indiana Business "Study to Examine Growth Around NSA Crane", August 18, 2015 visited February 9,2017

sustained the economic well-being of this region. Moving forward, tracking the workforce skillsets and income will provide the most comprehensive evidence of both the positive economic impact and the overall improvement in the quality of life to the citizens of this region.

Human Capital Database

Creation and implementation of a human capital database (HCD) will provide the leadership of NSA Crane with the most comprehensive measurement of overall economic impact that is available. Tracking the skillsets of the civilian and contract employees of NSA Crane is the most important data, representative of long term economic impact, which is currently not being collected. With the continued development and growth surrounding the technology sector in this region, the long term economic impact data must be collected to get a true sense of the overall impact of NSA Crane. This is the second and third order effect benefits that Mr. Todd Williams has referred to on numerous occasions. The base creates opportunities to work within a variety of technologically advanced fields. This in turn allows the local workforce to gain advanced skillsets that would otherwise not be available if NSA Crane were not located in this region. This ability to gain an advanced skillset and learn from those trained professionals with advanced degrees and understanding of the technologies being utilized creates a unique opportunity that is available to very few populations in the world.

Figure 52

Counties	# of Civilian Employees	Civilian Annual Income	# of Contract Employees	Contract Annual Income	Total # of Employees	Total Annual Income	NSA Crane Median Income	Median County Income	Economic Increase over Median	Total Economic Increase over Median Income
Crawford	0	0	10	749,310	10	749,310	74,931	47,697	27,234	272340
Daviess	331	19364773	104	7792824	435	27157597	62431.26	27400	35031.26	15238597
Dubois	83	5809768	17	1273827	100	7083595	70835.95	35385	35450.95	3545095
Greene	562	34561012	179	13412649	741	47973661	64741.78	28876	35865.78	26576545
Lawrence	674	39931032	207	15510717	881	55441749	62930.48	26413	36517.48	32171896
Martin	441	23167139	123	9216513	564	32383652	57417.82	44589	12828.82	7235456
Monroe	932	69400807	156	11689236	1088	81090043	74531.29	19340	55191.29	60048123
Orange	37	1939446	8	599448	45	2538894	56419.87	39812	16607.87	747354
Sullivan	20	1356840	7	524517	27	1881357	69679.89	27249	42430.89	1145634
Washington	8	335555	9	669519	17	1005074	59122	30527	28595	486115
Totals	3088	195866372	820	61438560	3908	257,304,932	65,304	32729	325753.3	147467155

[83]

With over 60,000 years of experience within the NSA Crane workforce it would be impossible to replicate the human capital that is currently in place. The HCD once implemented will track the skillsets of the NSA Crane employees from day one. It would track and maintain information of

[83] NSA Crane Economic Development Report FY14 Published 2015-07-23; U.S. Census Bureau American Community Survey https://www.census.gov/programs-surveys/acs/ completed 2015, released September 2016

each employee as they gain more advanced skillsets and are promoted within the facility. This will ensure that the individual employee is working in the most relevant job position given his or her skillset. In addition, it will ensure that training is not replicated, reducing the overall cost of continued professional development. This database will also capture and attribute a monetary value to the hours of those highly skilled professionals who provide the training and knowledge to the civilian and contract employees individually. This training is unique in that the skills being taught are specifically applicable to the operations within NSA Crane.

The table below has captured current value added figures for income, utilizing the most recent information released in 2015. The data collected below represents the salaries of those employed by NSA Crane, for the ten counties in this report, and averaged $65,304. Therefore, employees of NSA Crane added more than $147 million in additional income revenues over the median to the respected counties in which they reside. This indicates that civilian and contracted employees of NSA Crane, when aggregated, earned 50% more than the average household incomes of these southern Indiana counties annually. This significant increase in average household incomes is directly attributable to the advanced skillsets of these employees and the positions they hold within NSA Crane. Once again this signifies the need to create the HCD, so that these personal income impacts can be aggregated and provided to the respected counties and communities in which the NSA Crane civilian and contracted employees reside.

While the overall economic impact of NSA Crane can be calculated, and demonstrated utilizing multiple figures and examples located within this report, the true value added of NSA Crane is very hard to determine. Since many of the primary variables cannot be associated with a numeric value it is important to begin to collect the data suggested. The creation of the databases referred to in the paragraphs above will provide the respected counties, in which the employees of NSA Crane reside, with important economic impact data. From the simple table below, it is clear that the fiscal impact of NSA Crane represents a critical portion of the overall economic impact and GDP for each county within this study. Going forward the fiscal value of each employee will increase exponentially as the technology and skillsets of these employees continues to gain more advanced knowledge and training. In the end creation of these databases will provide the counties and communities within them a clear understanding of the economic impact NSA Crane provides. The overall economic vitality of the region is largely shaped by the continued growth and success of the NSA Crane facilities in regard to the advancement of both the technologies and the workforce this facility maintains. It is a mutually dependent relationship that will continue to develop and evolve with the technologies as they are brought online. In the end, providing the citizens of south central Indiana with the opportunity for employment within one of the most technologically advanced regions in the United States.[84]

[84] NSA Crane Economic Development Report FY14 Published 2015-07-23; U.S. Census Bureau American Community Survey https://www.census.gov/programs-surveys/acs/ completed 2015, released September 2016

Improving Human Capital

Human capital is reflected in the levels of knowledge, expertise and abilities of a population that enables them to participate in the economy. Therefore, developing human capital is an effective way to boost productivity and increase the level of participation in the economy.

To develop human capital, one of the very important part that each region should notice is the population and demographic changes. To adapt to population changes, the strategies Crane needs strategies to improve the satisfaction of population to the communities include:

- Responding to change in demographic, include through providing aged care services
- Supporting the creation of livable communities, including through investment in cultural or sporting facilities, and
- Minimizing the environmental impact of developments, including through environmental regulation.

Another aspect of human capital is the knowledge capital. A high knowledge population is important to improve the productivity of the region. The strategies that Crane can apply includes:

- Increasing the skills and qualifications of the labor force. This is one of the advantage of Crane while there are big universities surrounding. The leaders should improve partnership between Crane and surrounding universities such as Indiana University, Purdue Universities. They can cooperate to training their labor forces by organizing short-term courses as well as organize workshops to recruiting qualified labors from those universities.
- Lifting workforce participation rates, including through supporting the re-skilling of mature workers. Besides training for the young workers, it is also important to re-training mature workers to help them update with the new technologies and procedures.

Ensuring skills in the region match industry needs. One of the very important requirement for human capital is the matching of skills to the region needs. Therefore, Crane's leaders need to careful notice the change in industries and from that creating training pathways for the people who are preparing to participate in the labor force. The above analysis from Location Quotient Analysis suggests that currently the dominated industries in the region are: wood product manufacturing, furniture and related product manufacturing, food manufacturing so the training of labor force for these sectors is one of the priority for the Crane.

Finally, from our analysis, we showed the current situation of Crane in term of education, industries, technology and human capital. In education, Crane has benefit from surrounding universities, especially Indiana University. To boosting these benefits, Crane should continue to strengthen the relationship with Indiana University to utilize the technology and human capital resources. Besides, the presence of I69 suggests the attraction of transportation, distribution and shipping companies would bring huge benefit to the region's economic base. In location quotient analysis, we showed the dominant subsectors for ten counties in the region and the analysis suggested that a preparation of skills for individuals in the region should focus on the skills that benefit those subsectors include: customer services, quality control, or inventory management. The

analysis of contractors and the labor forces indicated the important economic impact of Crane on the region. To leverage this impact the most important factors that Crane should prepare for are the human capital resources which can be improved through the strategies to satisfy the population in the regions and a good preparation of knowledge for the population to adapt to economic changes.

Appendix

Vendor Name and NAICS Code	Dollars Obligated in FY 2015
AMERICAN INDUSTRIAL CORP	
333249	$24,385
333912	$12,660
ANDERSAT LLC	
238210	$1,291
APPLIED LOGISTICS SERVICES, INC.	
541330	$1,939,584
ARTISAN ELECTRONICS INCORPORATED	
541330	$4,510,570
BLACK & COMPANY	
811219	$930,689
332722	$6,007
BOMAR PNEUMATICS, INC.	
333991	$12,192
BROADWAVE TECHNOLOGIES, INC.	
334417	$4,115
BRUCE INC	
333319	$11,234
C & S ENGINEERING SERVICES, INC	
334419	$37,414
C AND S MACHINE INC	
332710	$1,280,568
C M ENGINEERING INC	
332995	$1,711,679
332710	$10,120
CAD/CAM TECHNOLOGIES, INC	
334111	$29,226

COMMUNICATIONS PRODUCTS INC	
541519	$7,616
CORYDON MACHINE & TOOL CO INC	
332439	$20,250
CRICHLOW INDUSTRIES INC	
339950	$9,880
326113	$3,760
D & V PRECISION SHEETMETAL INC	
332710	$133,604
DBISP LLC	
334111	$11,310
EARL, GARY	
332710	$146,819
333514	$5,034
ELECTRONIC EVOLUTIONS, INC.	
511210	$35,400
EMBREE MACHINE INC.	
332710	$212,962
332994	$8,664
ENGINEERED TESTING SYSTEMS LLC	
541380	$9,800
EXELIS INC.	
334511	$7,248,704
FRAME STATION INC, THE	
339999	$8,505
GARCOR SUPPLY CO	
333414	$3,255
GARRITY TOOL COMPANY, INC.	
332710	$412,906

GEORGE E BOOTH CO INC	
332912	$4,994
H & W TOOL GRINDING & MACHINE REPAIR INC	
333519	$1,870
HAMBLEN MACHINE, INC.	
333999	$2,950
HAWKINS DARRYAL	
325212	$10,425
HEADCO INDUSTRIES, INC.	
332991	$27,348
HELIX TECHNOLOGIES INC	
334511	$1,370,599
HORNER INDUSTRIAL SERVICES, INC.	
335312	$53,880
HUPP & ASSOCIATES INC	
335931	$359,568
INDESIGN, LLC	
334419	$190,760
INDIANA MICROELECTRONICS, LLC	
541712	$639,321
INDIANA OXYGEN COMPANY INC	
221210	$89,966
INDY PERFORMANCE COMPOSITES, INC.	
333511	$15,105
332994	$10,000
IRIS RUBBER COMPANY INC	
326291	$24,000
J & N METAL PRODUCTS, LLC	
332710	$670,493

J & R TOOL, INC	
332710	$724,666
326150	$25,793
JASPER ELECTRIC MOTOR INC	
335312	$150,126
811310	$130,734
JOHNNY'S SIGNS INC	
337215	$17,781
339950	$10,960
JWS MACHINE, INC.	
334419	$201,375
KEY ELECTRONICS, INC.	
334419	$2,000
KNOX COUNTY ASSOCIATION FOR RETARDED CITIZENS INC	
332811	$16,881
322212	$6,395
LIBERTY INDUSTRIES INC.	
336212	$17,001
LINSUN INDUSTRIAL SUPPLY	
332722	$4,080
LOUGHMILLER MACHINE, TOOL & DESIGN	
332710	$1,011,000
MAJOR TOOL AND MACHINE INC	
332710	$243,750
MARION TOOL & DIE, INC	
332710	$84,323
MID-AMERICA FOUNDATION SUPPLY INC	
336611	$189,255

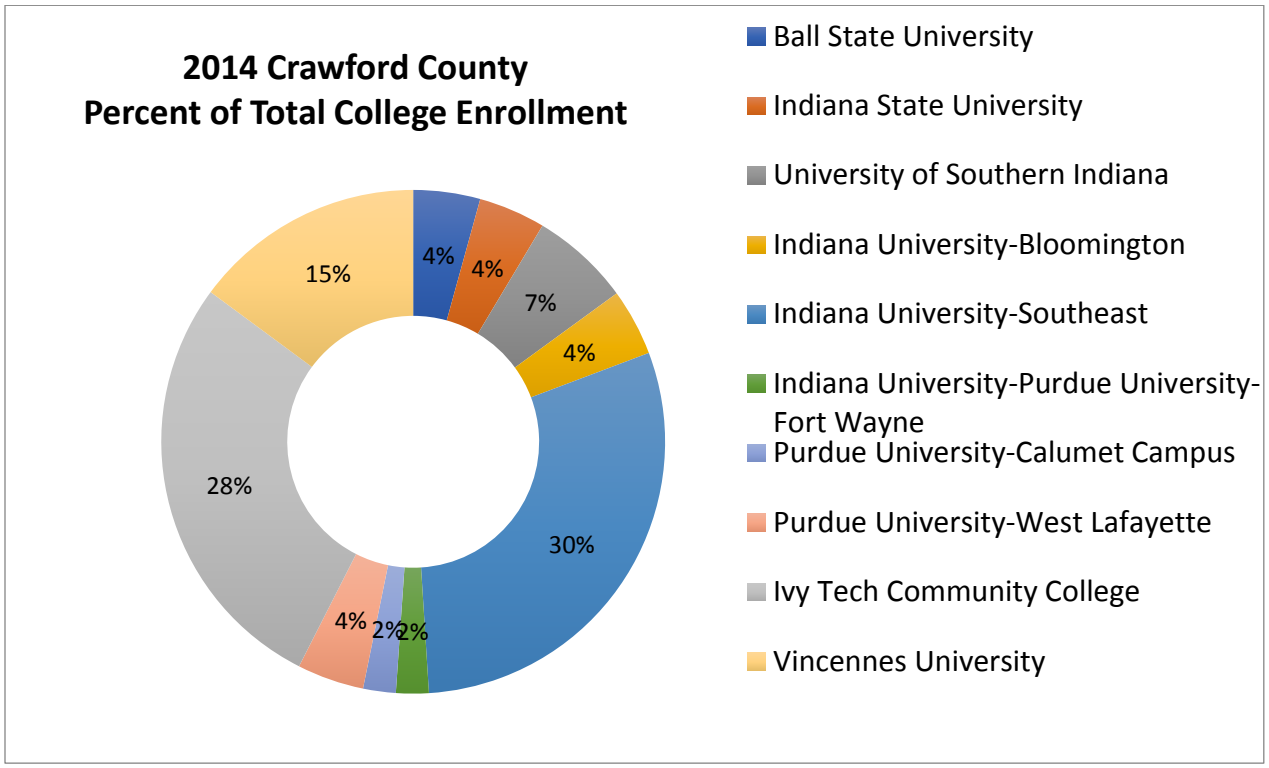
MIDWEST INDUSTRIAL METAL FABRICATION, INC.	
332439	$387,990
MOTION ENGINEERING COMPANY, INC.	
333316	$112,550
333314	$8,981
MOTION INDUSTRIES, INC.	
332991	$19,469
334519	$6,062
339991	$4,998
MSP AVIATION, INC.	
332710	$254,042
325211	$4,223
NEFF GROUP DISTRIBUTORS, INC.	
332710	$6,776
NMC, INC.	
332710	$58,585
NOEL-SMYSER ENGINEERING CORP	
334419	$46,339
OAK SECURITY GROUP, LLC	
332510	$18,538
ONLINE RESOURCES INC	
334513	$28,150
334614	$20,000
ORANGE COUNTY REHABILITATIVE AND DEVELOPMENTAL SERVICES INC	
337110	$3,738
OWENS COMMUNICATIONS, INC.	
334220	$7,417
PEI/GENESIS, INC.	

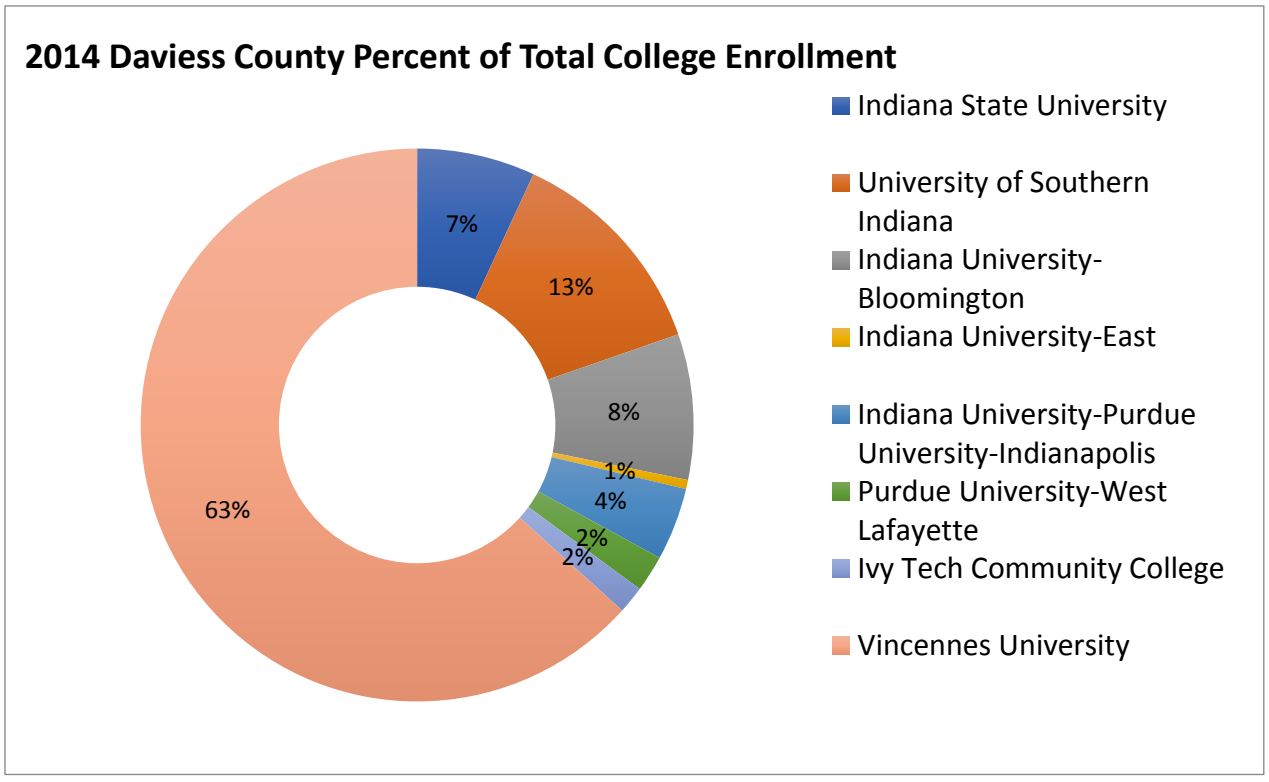
335999	$21,194
PENWAY, INC.	
331523	$8,624
PNL SECURITY GROUP, INC	
561621	$11,410
POLYPHASE MICROWAVE INC.	
334515	$149,153
PRIMET FLUID POWER COMPANY INC	
333996	$6,132
PRN ASSOCIATES INC	
334419	$455,377
PRN ASSOCIATES, INCORPORATED	
335931	$67,439
PRO SEAL & PLASTIC LLC	
339991	$22,388
R.S. HUGHES COMPANY, INC.	
325520	$5,234
RANGER AEROFAB, LLC	
332710	$3,740,419
332439	$1,646,043
562910	$75,216
332811	$3,031
RAPID REPRODUCTIONS, INC.	
339940	$5,195
RAYDAR & ASSOCIATES, INC.	
541330	$1,728,880
334515	$6,808,986
334220	$227,952
332812	$55,243

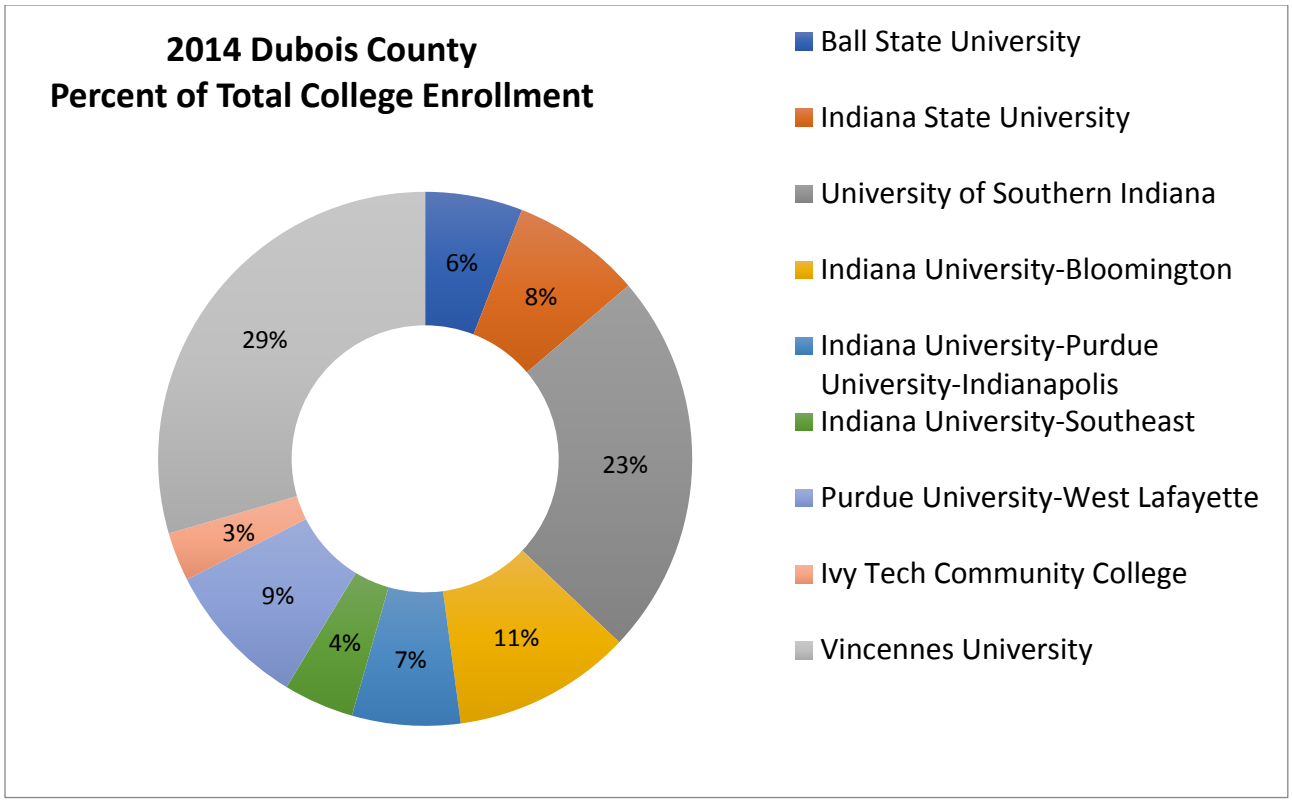
561210	$2,250
332710	$22,720
332813	$10,650
RAYTHEON COMPANY	
334511	$6,683,977
RAYTHEON TECHNICAL SERVICES COMPANY LLC	
334511	$196,103
RL GUIMONT COMPANY INC	
334419	$95,971
334515	$7,978
ROBERTS DISTRIBUTORS, L.P.	
335129	$4,348
S TECH MACHINE AND WELDING	
332710	$18,678
SHARES INC	
561990	$66,000
SOURCE DETECTION SYSTEMS LLC	
811219	$428,810
SPECIALTY CNC INCORPORATED	
332710	$1,036,386
STIMULUS ENGINEERING SERVICES, INC.	
541330	$11,337,174
334511	$435,822
561210	$68,478
334419	$700
SYSTEMS DESIGN AND ANALYSIS INC	
334419	$504,878
335931	$83,312
332618	$31,467

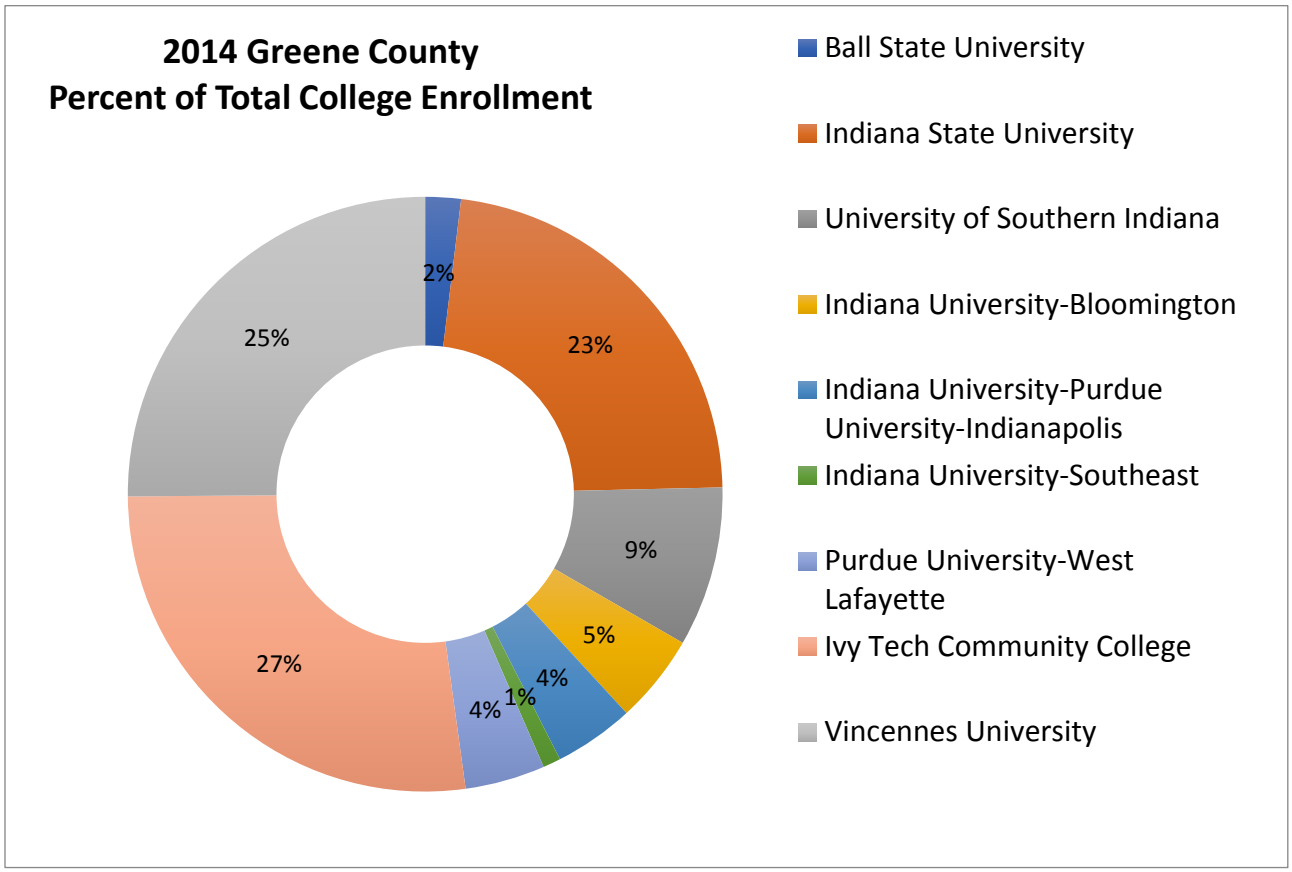
541330	$16,000
238210	$6,731
TANGENT LABS LLC	
811219	$150,000
THE FREE ENTERPRISE SYSTEM INC	
485510	$6,920
TIPPMAN INDUSTRIAL PRODUCTS INC	
333249	$3,873
TOTAL CONCEPTS OF DESIGN, INC.	
332999	$127,309
TRI STAR ENGINEERING, INC.	
541330	$7,063,946
334511	$7,053,637
TRUSTEES OF INDIANA UNIVERSITY	
531120	$7,363
TS2 TACTICAL SPEC-SOLUTIONS INC.	
314999	$22,749
TWEATHERFORD, INC.	
334118	$10,543
URS FEDERAL TECHNICAL SERVICES, INC.	
335931	$4,455
WABASH METAL PRODUCTS, INC	
333517	$2,500
WAGNER EQUIPMENT CO., INC.	
335999	$14,337

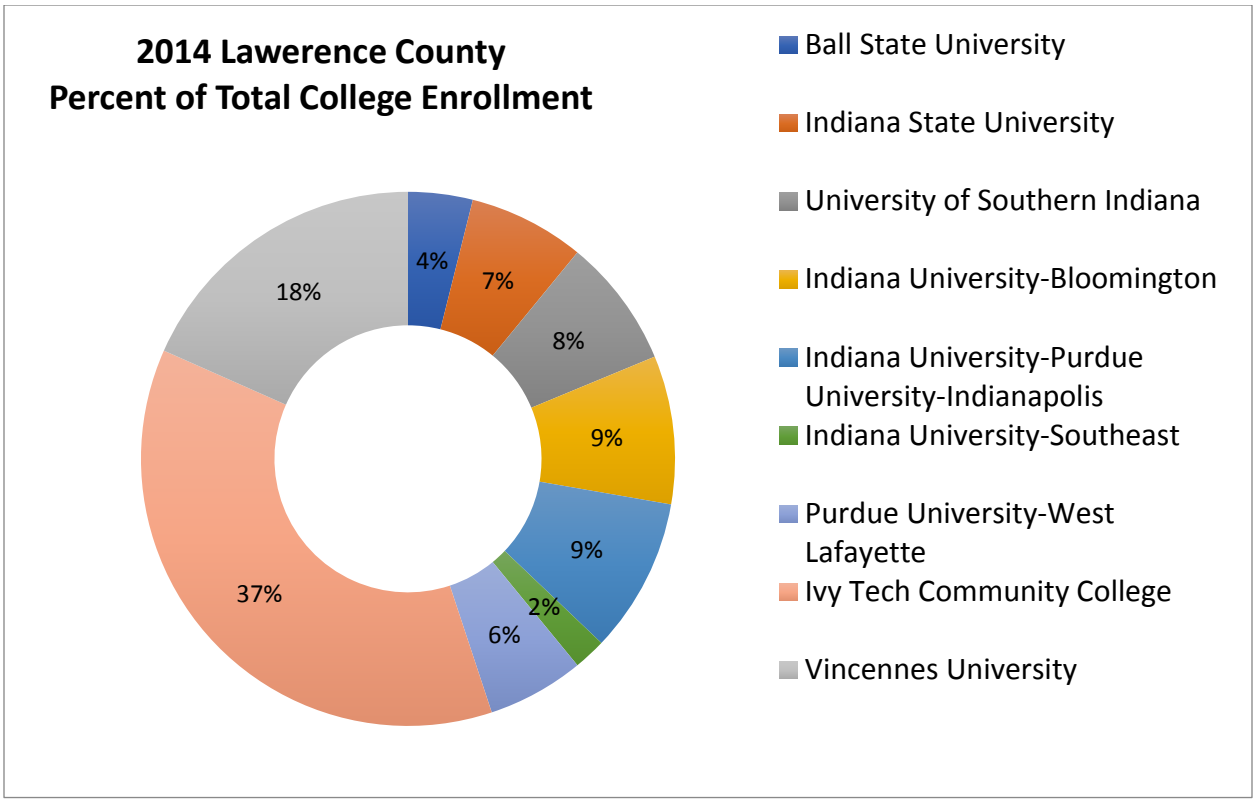
College Enrollment by County

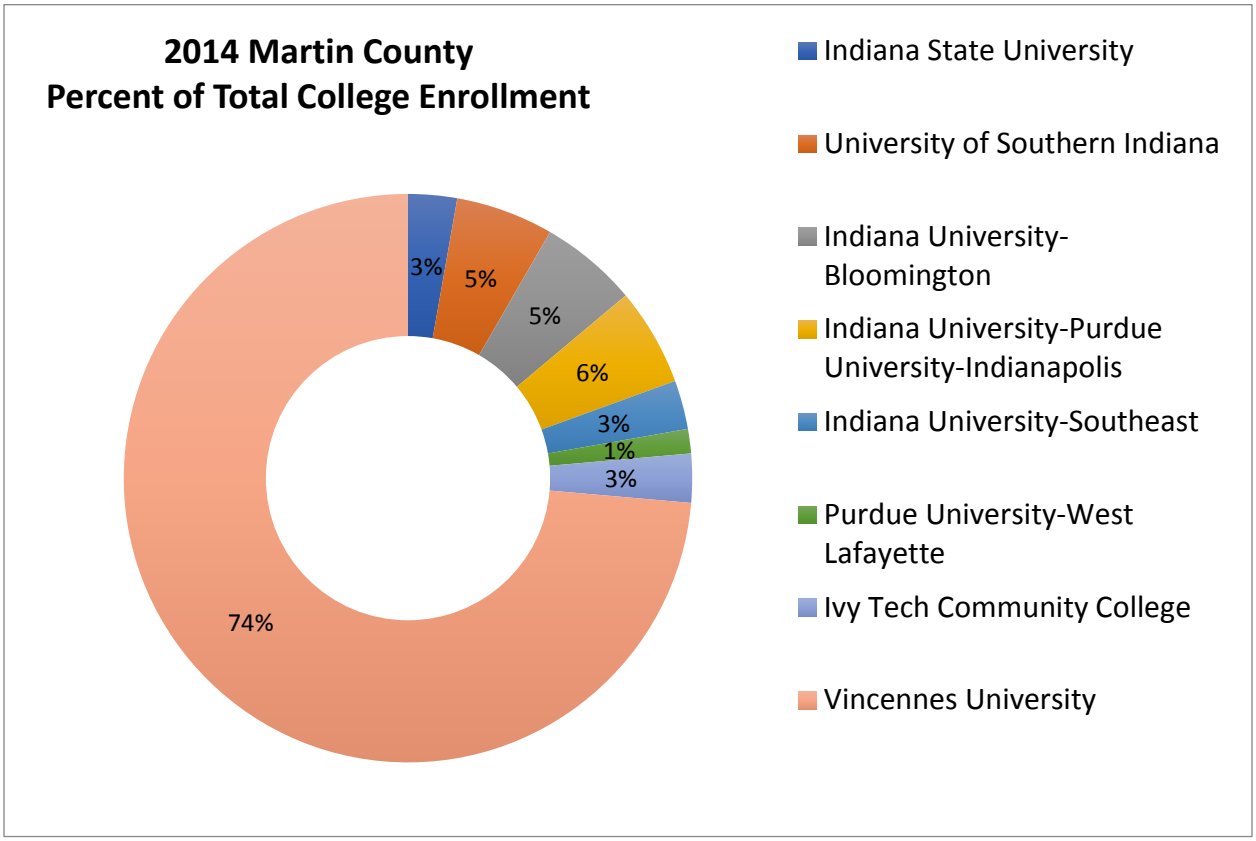


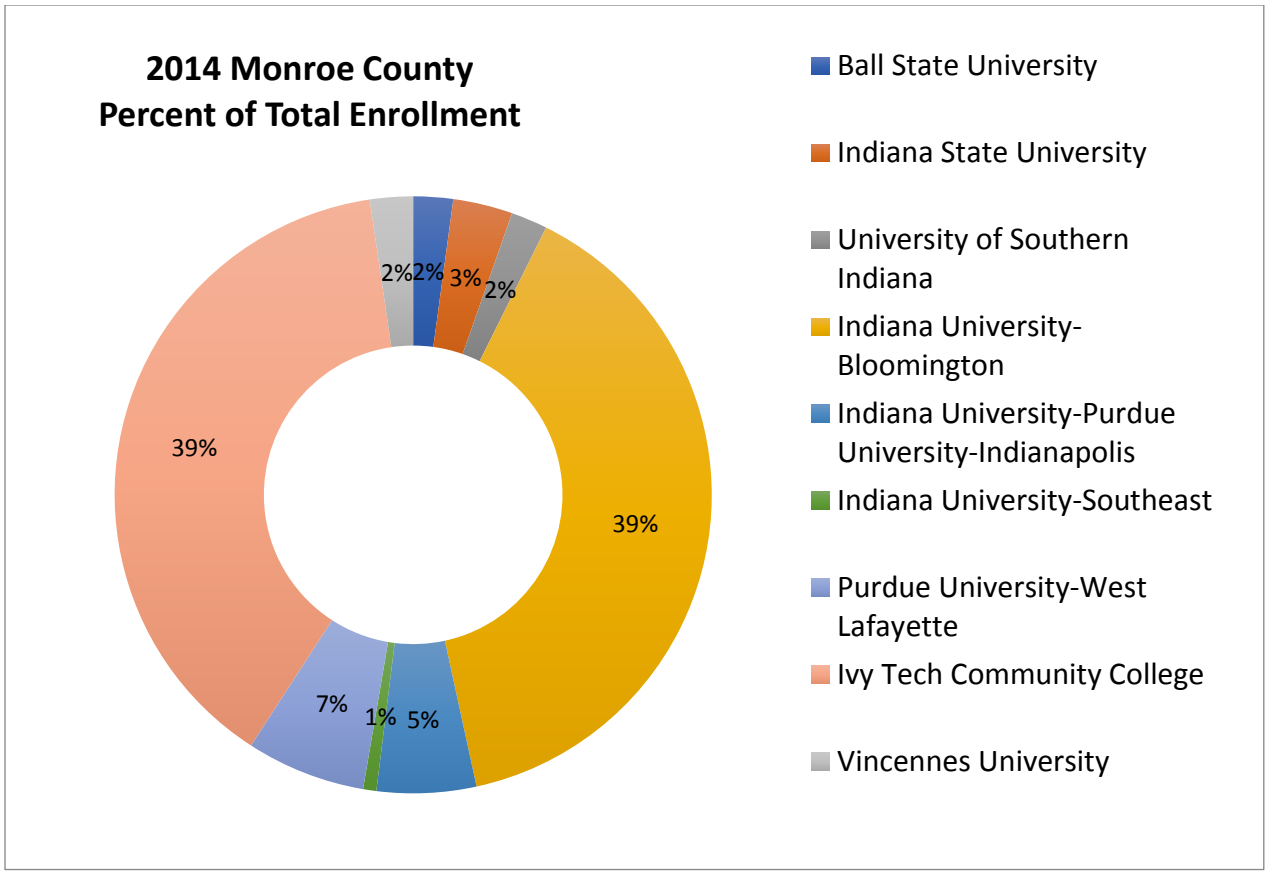


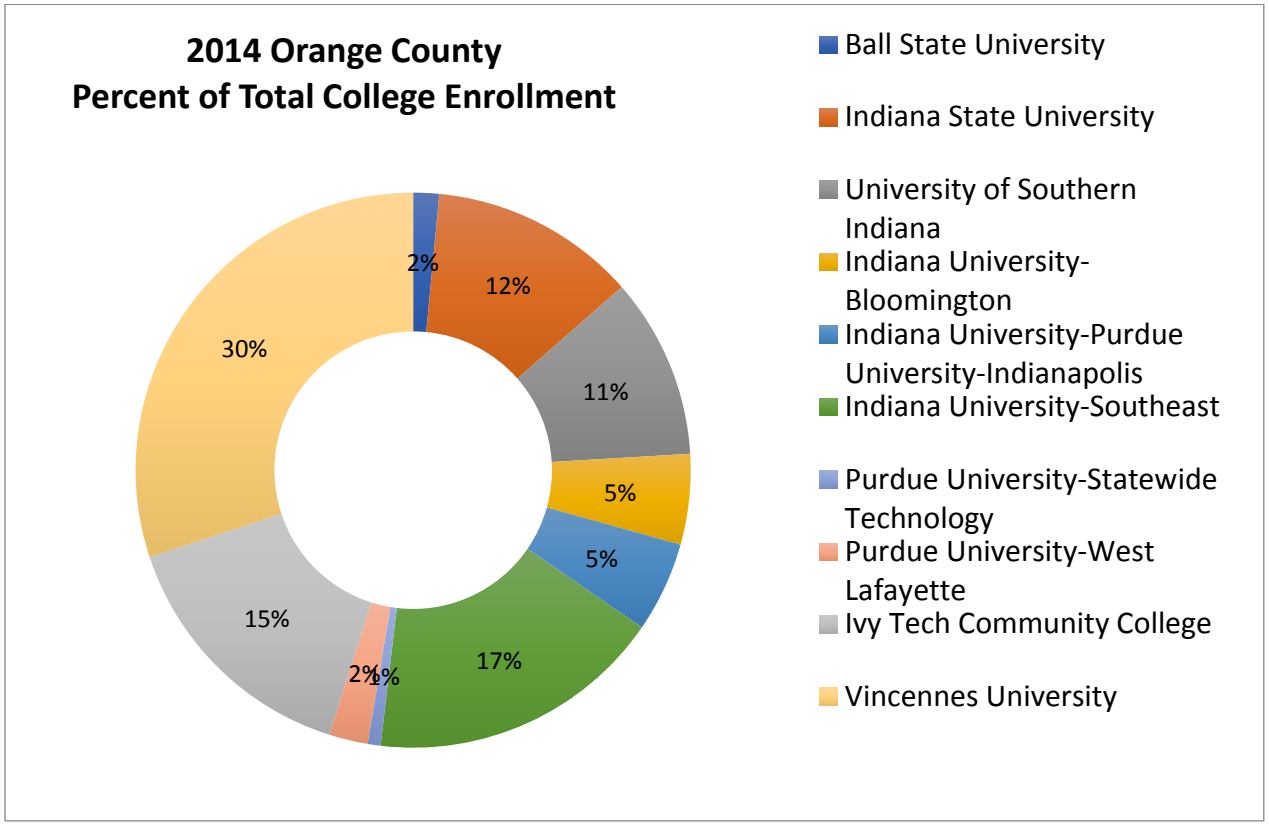

2014 Dubois County
Percent of Total College Enrollment
6%
8%
23%
11%
7%
4%
9%
3%
29%
Ball State University
Indiana State University
University of Southern Indiana
Indiana University-Bloomington
Indiana University-Purdue University-Indianapolis
Indiana University-Southeast
Purdue University-West Lafayette
Ivy Tech Community College
Vincennes University

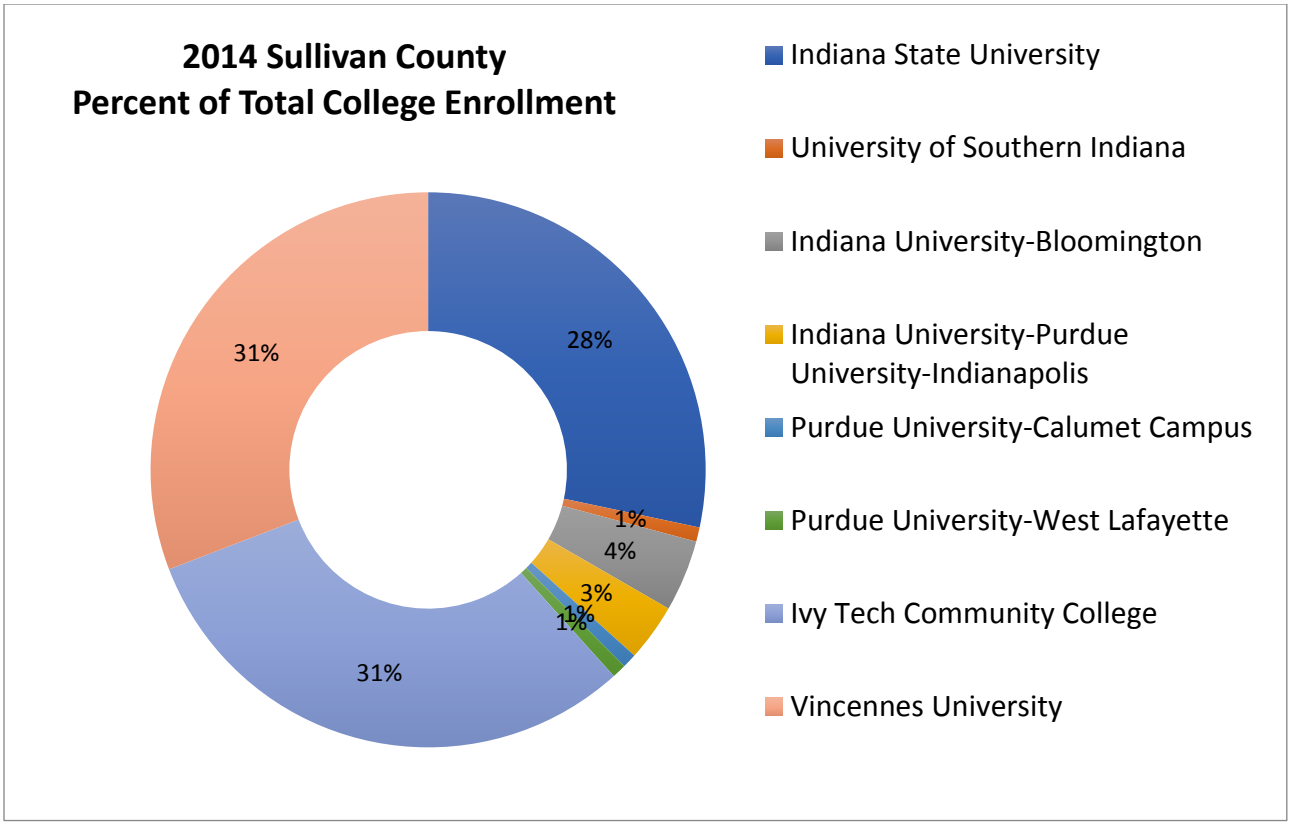

2014 Greene County
Percent of Total College Enrollment
2%
23%
9%
5%
4%
1%
4%
27%
25%
Ball State University
Indiana State University
University of Southern Indiana
Indiana University-Bloomington
Indiana University-Purdue University-Indianapolis
Indiana University-Southeast
Purdue University-West Lafayette
Ivy Tech Community College
Vincennes University


2014 Lawerence County
Percent of Total College Enrollment
4%
7%
8%
9%
9%
2%
6%
37%
18%
Ball State University
Indiana State University
University of Southern Indiana
Indiana University-Bloomington
Indiana University-Purdue University-Indianapolis
Indiana University-Southeast
Purdue University-West Lafayette
Ivy Tech Community College
Vincennes University

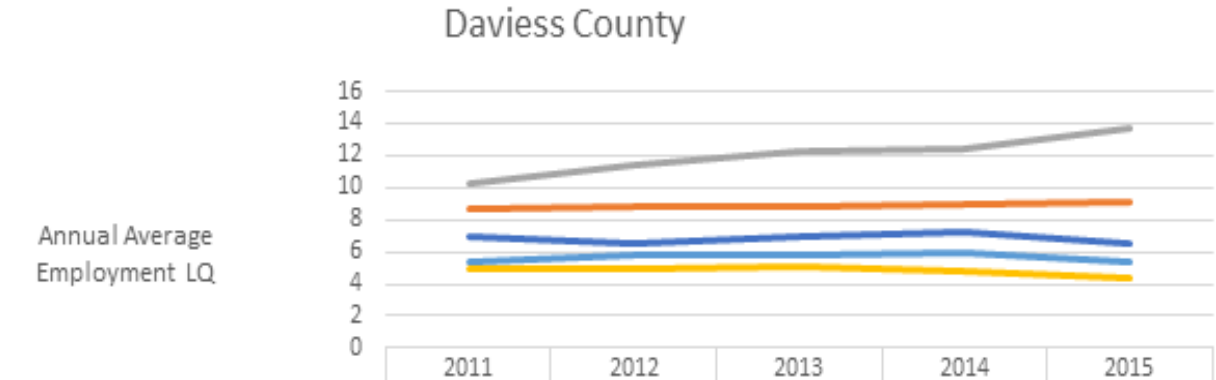

2014 Martin County
Percent of Total College Enrollment
3%
5%
5%
6%
3%
1%
3%
74%
Indiana State University
University of Southern Indiana
Indiana University-Bloomington
Indiana University-Purdue University-Indianapolis
Indiana University-Southeast
Purdue University-West Lafayette
Ivy Tech Community College
Vincennes University


2014 Monroe County
Percent of Total Enrollment
2%
2%
3%
2%
39%
39%
7%
1%
5%
Ball State University
Indiana State University
University of Southern Indiana
Indiana University-Bloomington
Indiana University-Purdue University-Indianapolis
Indiana University-Southeast
Purdue University-West Lafayette
Ivy Tech Community College
Vincennes University


2014 Orange County
Percent of Total College Enrollment
2%
12%
11%
5%
5%
17%
2%
1%
15%
30%
Ball State University
Indiana State University
University of Southern Indiana
Indiana University-Bloomington
Indiana University-Purdue University-Indianapolis
Indiana University-Southeast
Purdue University-Statewide Technology
Purdue University-West Lafayette
Ivy Tech Community College
Vincennes University

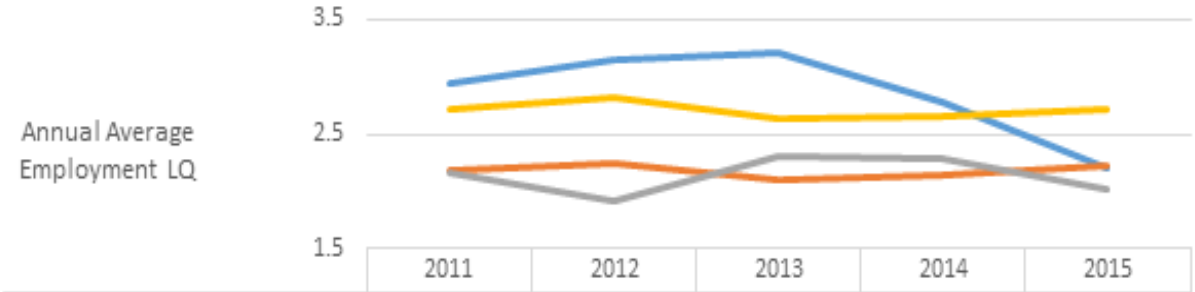


Additional County Location Quotients



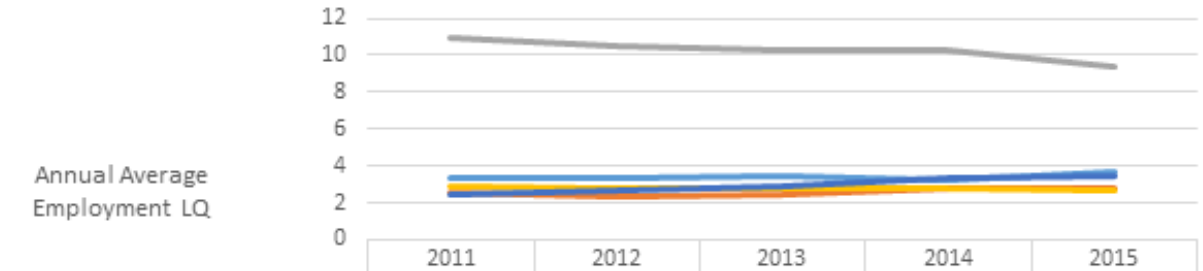
	2011	2012	2013	2014	2015
Construction of Buildings	5.35	5.84	5.82	5.92	5.32
Food Manufacturing	8.66	8.87	8.79	8.98	9.16
Furniture and Related Product Manufacturing	10.27	11.38	12.21	12.34	13.74
Truck Transportation	4.98	4.97	5.04	4.72	4.41
Wood Product Manufacturing	6.96	6.45	6.92	7.22	6.53

Greene County



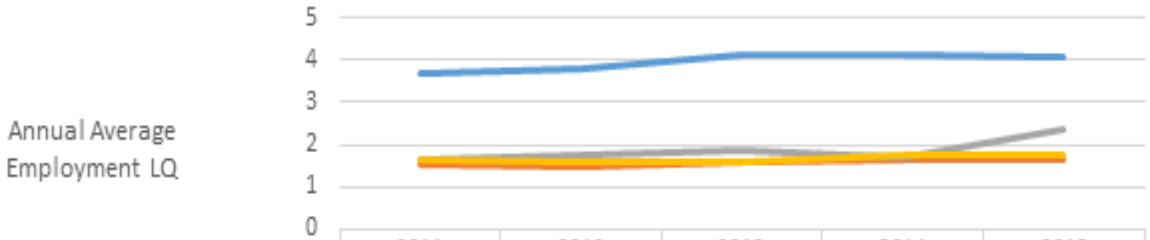
	2011	2012	2013	2014	2015
Gasoline Stations	2.94	3.15	3.22	2.77	2.2
General Merchandise Stores	2.18	2.25	2.1	2.14	2.22
Nonmetallic Mineral Product Manufacturing	2.17	1.91	2.31	2.28	2.02
Nursing and Residential Care Facilities	2.72	2.83	2.64	2.66	2.71

Lawrence County



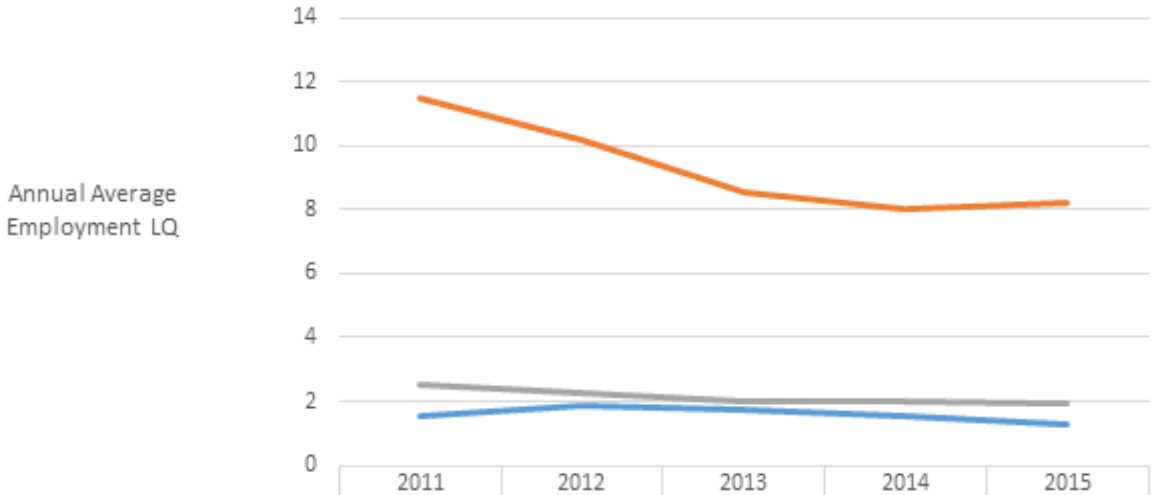
	2011	2012	2013	2014	2015
Fabricated Metal Product Manufacturing	3.39	3.3	3.45	3.18	3.64
Machinery Manufacturing	2.57	2.39	2.48	2.73	2.82
Nonmetallic Mineral Product Manufacturing	10.97	10.54	10.28	10.27	9.38
Nursing and Residential Care Facilities	2.89	2.8	2.77	2.74	2.67
Plastics and Rubber Products Manufacturing	2.41	2.62	2.88	3.38	3.5

Monroe County

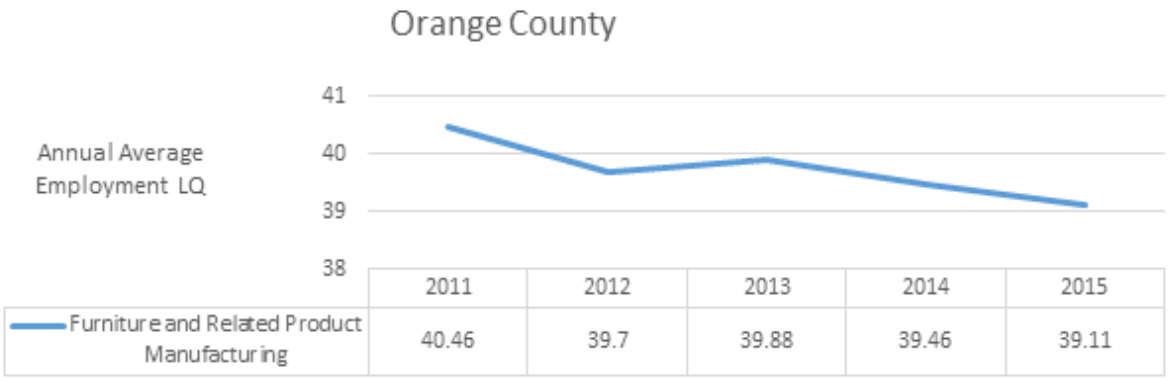


	2011	2012	2013	2014	2015
Chemical Manufacturing	3.68	3.8	4.11	4.11	4.09
Membership Associations and Organizations	1.54	1.49	1.57	1.63	1.67
Mining, Except Oil and Gas	1.65	1.76	1.85	1.68	2.34
Miscellaneous Store Retailers	1.63	1.59	1.59	1.74	1.78

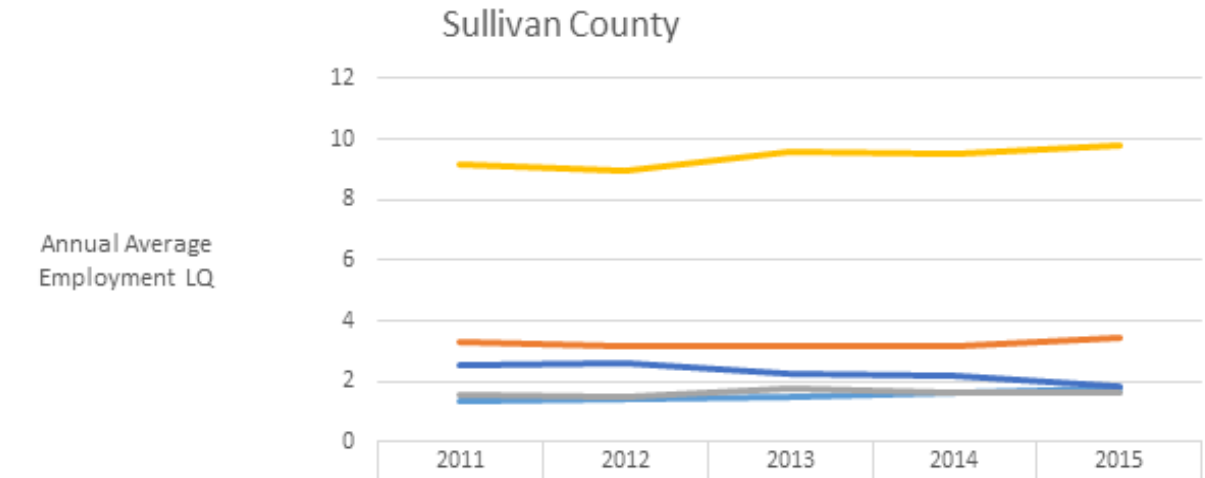
Orange County



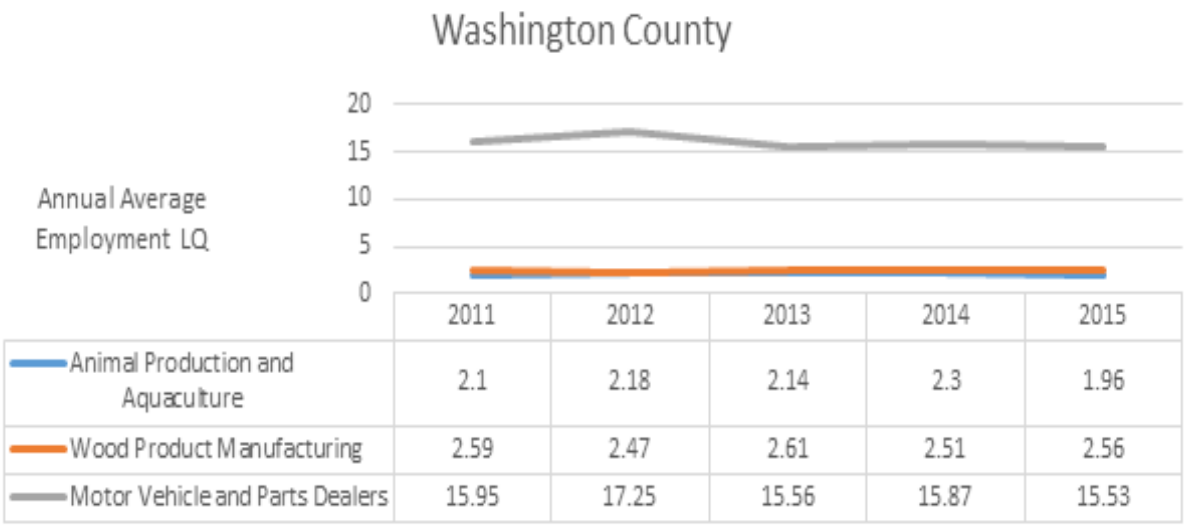
	2011	2012	2013	2014	2015
Gasoline Stations	1.52	1.85	1.71	1.55	1.29
Heavy and Civil Engineering Construction	11.51	10.2	8.54	8.05	8.19
Wood Product Manufacturing	2.5	2.26	1.98	1.97	1.94



	2011	2012	2013	2014	2015
Furniture and Related Product Manufacturing	40.46	39.7	39.88	39.46	39.11



	2011	2012	2013	2014	2015
Crop Production	1.38	1.41	1.47	1.63	1.77
Gasoline Stations	3.29	3.17	3.18	3.15	3.45
Miscellaneous Store Retailers	1.54	1.5	1.74	1.63	1.62
Utilities	9.2	8.96	9.59	9.53	9.81
Wood Product Manufacturing	2.51	2.58	2.23	2.22	1.82



	2011	2012	2013	2014	2015
Animal Production and Aquaculture	2.1	2.18	2.14	2.3	1.96
Wood Product Manufacturing	2.59	2.47	2.61	2.51	2.56
Motor Vehicle and Parts Dealers	15.95	17.25	15.56	15.87	15.53