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Jobs depicted on cover, clockwise
from bottom left: cost estimator,
brakeman, medical assistant (with
patient), drill press operator, brake
inspector, surgical technicians.

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From the Editor's Desk:

This issue of the IBR provides insights on two very different issues. The first article is based on research into Indiana jobs for skilled labor that do not require 4 years of college. This research quantifies and specifies those jobs that pay well and also denotes the type of skills and training required. What are those jobs? Answers begin on the opposite page.

Our second article probes population change and shifts within counties. This is done at the township level, a geography that is relatively constant within our Hoosier borders, the last boundary change having taken place decades ago. Are counties experiencing sprawl, stability or decline within their borders? Read on for answers.

Note: Our more observant readers may have noticed some changes to the credits given on the left. The Indiana Business Research Center has a new director, while we have gained an executive director and an additional location not noted at left (on the Indiana University Northwest campus).

Good Pay, B.A. Not Required: An Analysis of Occupations, Pay and Educational Requirements

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A common assumption among people is that a four-year degree is the only ticket to career success. In fact, only 22 percent of this nation's workers are in jobs that require a bachelor's degree and three-fourths of the U.S. adult population does not have a bachelor's degree.

The IEDC recently analyzed occupations within Indiana and found that 78 meet the following criteria:

- Pay \$20,000 or more per year
- Expect 10-year growth of 10 percent or more
- Do not require a bachelor's degree
- Offer sufficient numbers of jobs within the given occupation class

A unique database was created by the IEDC to conduct this research. That database combines federal and state labor force data on employment, occupations and wages. This database uses a categorization scheme developed by the U.S. Bureau of Labor Statistics (BLS)¹. This scheme categorizes occupations into 11 separate levels of education and training. Categories start with short-term on-the-job training and progress through long-term on-the-job training, associate's degree, bachelor's degree, professional or graduate degree and doctoral degree. Specifics on the 78 occupations that met the above four criteria and the seven job clusters or categories are described below.

Focus Occupations

These 78 occupations were called focus occupations and combined employ 633,000 Hoosiers, or 22 percent of the workforce in the state. These focus occupations were combined into seven career clusters or industries:

- Building and Construction
- Business, Management and Finance
- Health Services
- Manufacturing and Processing
- Marketing, Sales and Promotion
- Mechanical Repair and Precision Crafts
- Transportation

The occupations employing the most Hoosiers are helpers, laborers and material movers (people who move things by hand); registered nurses; and truck drivers.

The occupations paying more than \$38,000 are dental hygienists, first line construction supervisors, selected business services sales agents, other sales representatives and the group that includes plumbers, pipe fitters and steamfitters.

Indiana occupations expected to grow by more than 50 percent by 2006 are physical and corrective therapy assistants and aides; bill and account collectors; combination machine tool setters and setup operators; and adjustment clerks.

Three key occupations that employ another 133,000 Hoosiers were excluded from this study, despite a good wage and educational match. These were licensed practical nurses, secretaries, and assemblers and fabricators. Each of them is expected to grow by less than 10 percent by 2006.

Building and Construction (Table 1)

The construction industry offers some of the best-paid jobs without a degree requirement, particularly within the skilled trades and crafts, such as carpenters, electricians and bricklayers. The Indiana construction industry had approximately 145,000 jobs in 1998 with an annual average wage of \$33,380.

Decoding the Education and Training Codes in the Tables

- Code 7.....Bachelor's degree — four-year bachelor's degree.
- Code 6.....Associate's degree — associate's degree or at least 2 years of full-time equivalent academic work
- Code 5.....Post-secondary vocational training — completion of vocational school training
- Code 4.....Work experience in a related occupation — skills obtained through work experience in a related occupation
- Code 3.....Long-term on-the-job training — 12 months or more of on-the-job training or combined work experience and formal classroom instruction in order for workers to develop the skills needed for average job performance
- Code 2.....Moderate-term on-the-job training — workers can develop the skills needed for average job performance after one-to-12 months of combined on-the-job experience and informal training
- Code 1.....Short-term on-the-job training — workers generally can develop the skills needed for average job performance after a short demonstration or up to one month of on-the-job experience and instruction

Many construction jobs are forecast to grow at rates in the high 20 percent to low 30 percent range over the decade. Jobs in this industry do require long-term training and most workers enter through apprenticeships. The industry is heavily unionized and employment is often affected by seasonal conditions and swings in the economy. These 11 focus occupations (of the entire 78), have combined employment of 61,565.

Business Management and Finance (Table 2)

In the hospitality area, only food service and lodging managers meet the focus occupation criteria. It is the 11th fastest growing business occupation, increasing at a rate of 34 percent over the decade. Four key factors improve mobility and job advancement for food service and lodging managers: strong expansion and job growth; 24-hour operation; high turnover; and wide variety and many levels within an organization.

Administrative jobs are found across a wide variety of industries. Nationally, it is the largest

occupational group. About 104,000 Hoosiers have well-paying occupations in this category. Although the overall category is growing less than 10 percent, some occupations will have very strong growth over the next several years. For example, adjustment clerks and bill and account collectors should increase by more than 50 percent. Entry to and advancement in this career cluster are possible without formal education beyond high school, although technical training may be necessary for advancement.

Health Services (Table 3)

The health care industry is a substantial employer in Indiana, with annual average employment of more than 225,000 jobs. The greatest and most varied opportunities in health-care occupations are found in the metropolitan areas of the state, where large hospitals and medical centers are located, yet opportunities exist throughout the state. Health care occupations are not only fast growing, but they also pay very good wages. However, extensive formal

“The construction industry offers some of the best-paid jobs without a degree requirement.”

Table 1

	Indiana Avg. Annual Salary, 1998	Growth Rate to 2006	Estimated Statewide Employment	Education & Training Level
Building and Construction			61,565	
First Line Supervisors, Construction	\$40,240	17.30%	7,280	4
Carpenters	\$29,900	20.40%	19,308	3
Electricians.....	\$37,750	18.00%	12,785	3
Bricklayers.....	\$37,400	29.00%	3,043	3
Concrete and Terrazzo Finishers	\$30,000	23.60%	3,733	3
Painters and Paperhangers, Construction & Maintenance	\$26,920	34.80%	6,184	2
Plumbers, Pipefitters and Steamfitters.....	\$38,080	17.50%	8,136	3
Helpers, Brick and Stone Mason.....	\$26,200	28.90%	2,102	1
Helpers, Carpenters and Related Workers	\$20,650	30.00%	4,012	1
Helpers, Plumbers, Pipefitters, and Steamfitters	\$21,220	26.60%	1,162	1
Helpers, All Other Construction Trades Workers	\$23,240	21.70%	1,100	1

education is often required for higher-paid nursing and technical occupations, with almost all requiring an associate's degree or vocational-technical education. Dental assistant is the only occupation within this cluster that does not require formal education beyond high school.

Manufacturing and Processing (Table 4)

Indiana is the leading manufacturing state in the nation with 24 percent of its total employment in the manufacturing sector. As of 1998, the total employment (annual average) in manufacturing was 683,900, with an annual average wage just above \$40,000. Machine operators account for 14 of these focus occupations, reflecting the increasing use of technology and automation in the production process. Welders and welding machine operators require formal vocational-technical training; all others are learned through on the job training.

Marketing, Sales and Promotion (Table 5)

Marketing, sales and promotion occupations are concentrated in the retail and wholesale industries, with 690,000 jobs in just these two industries. Overall, the category is expected to increase by 17.5 percent from 1996 to 2006. That rate of growth would equal 158,610 new employees. Almost 99,000 of the openings will come from replacements.

Nationally, the number of workers in this cluster is growing at a slower rate than in earlier periods. The slower growth is attributed, in part, to automated and Internet sales transactions. Despite a modest growth rate, the number of employees in this occupational cluster and the significant need for replacement workers will provide substantial opportunity for advancement.

Entry to and advancement in the focus occupations in Business, Management and Finance are possible without formal education beyond high school, although technical training may be necessary for advancement.

Table 2

	Indiana Avg. Annual Salary, 1998	Growth Rate to 2006	Estimated Statewide Employment	Education & Training Level
Business, Management and Finance			104,164	
Hospitality Industry				
Food Service and Lodging Managers	\$25,400	34.20%	8,004	4
Administrative Support and Clerical Occupations				
Clerical Supervisors and Managers	\$29,110	20.30%	24,588	4
Loan and Credit Clerks	\$20,400	20.10%	4,046	1
Adjustment Clerks	\$21,970	50.30%	7,612	1
Insurance Claims Clerks	\$21,770	26.50%	2,518	2
Bill and Account Collectors	\$21,520	52.10%	4,129	1
Legal Secretaries	\$23,700	15.70%	4,449	5
Medical Secretaries	\$20,170	18.10%	5,571	5
Customer Service Representatives, Utilities	\$25,230	24.90%	2,342	1
Traffic, Shipping, and Receiving Clerks	\$22,660	13.80%	19,639	1
All Other Material Recording, Scheduling and Distribution Workers	\$23,410	11.20%	5,554	1
All Other Clerical and Administrative Workers	\$22,590	27.50%	15,713	1

Health care occupations are not only fast growing in Indiana, but they also pay very good wages. While some of the highest-paid nursing positions require an associate's degree or vocational-technical education, a dental assistantship does not require formal education beyond high school.

Most of the well-paying occupations in this cluster are at the supervisory level or involve more specialized skills. While none of the occupations have educational requirements beyond high school, some of the more specialized sales agents may require a postsecondary or college education.

Mechanical Repair and Precision Crafts (Table 6)

This career cluster includes an assortment of occupations that cross many industries. Employees are generally mechanics, repairers, installers or precision workers. It includes 16 focus occupations and employs 93,189 Hoosiers. Seven of these occupations require formal postsecondary education. The remaining 9 require long-term or moderate-term on-the-job training. A few require apprenticeships combining on-the-job training with formal classroom instruction. All of them demand strong basic skills, good manual dexterity and mechanical aptitude.

Transportation (Table 7)

This cluster is particularly relevant to Indiana, which has a high concentration of jobs related to trucking, warehousing and distribution. Eight focus occupations are in this cluster, including dispatchers, truck drivers and others involved in moving or distributing materials and goods. Most of the focus occupations require only short-term or moderate length on-the-job training. Formal truck driver training programs of short duration are available for new entrants. Operating engineers often learn their trade through apprenticeship programs.

Table 3

	Indiana Avg. Annual Salary, 1998	Growth Rate to 2006	Estimated Statewide Employment	Education & Training Level
Health Services			63,337	
Registered Nurses	\$37,290	12.40%	42,161	6
Dental Hygienists	\$41,730	36.90%	3,387	6
Radiologic Technologists.....	\$29,170	12.50%	2,600	6
Surgical Technologists	\$24,490	12.00%	861	5
All Other Health Professionals, Paraprofessionals, and Technicians	\$25,700	13.70%	8,873	6
Dental Assistants.....	\$21,460	27.90%	4,359	2
Physical and Corrective Therapy Assistants and Aides	\$25,660	55.20%	1,096	6

Most careers in Manufacturing and Processing are learned through on-the-job training....None of the occupations in the selected Marketing, Sales and Promotion cluster have educational requirements beyond high school.

Table 4

	Indiana Avg. Annual Salary, 1998	Growth Rate to 2006	Estimated Statewide Employment	Education & Training Level
Manufacturing and Processing.....			132,502	
Numerical Control Machine Tool Operators and Tenders, Metal/Plastic	\$28,600	41.20%	4,603	2
Combination Machine Tool Setters and Set-Up Operators	\$35,210	50.90%	3,645	2
Combination Machine Tool Operators and Tenders	\$27,430	39.40%	4,007	2
Welding Machine Setters and Set-Up Operators	\$26,220	11.60%	2,152	2
Welding Machine Operators and Tenders	\$27,250	11.50%	3,282	2
Metal Fabricators, Structural Metal	\$20,700	27.00%	474	2
Plastic Molding Machine Setters, and Set-Up Operators.....	\$26,110	22.20%	2,250	2
Plastic Molding Machine Operators and Tenders.....	\$22,910	21.90%	8,270	2
Electrolytic Plating, Operators, Metal/Plastic	\$21,980	24.00%	631	2
All Other Metal and Plastic Setters	\$25,300	30.10%	5,755	2
All Other Metal and Plastic Operators.....	\$26,950	32.90%	7,379	2
Cutting and Slicing Machine Operators and Tenders.....	\$21,390	11.00%	1,605	2
Painters, Transportation Equipment.....	\$31,340	23.00%	468	2
Coating, Painting, Spraying Machine Setters & Set-Up Operators	\$22,310	15.90%	1,422	2
Painting Machine Operators and Tenders.....	\$21,050	14.30%	4,367	2
All Other Machine Operators.....	\$26,130	13.20%	16,100	2
All Other Precision Assemblers, Metal	\$24,700	17.20%	4,684	4
Welders and Cutters	\$25,670	17.20%	11,512	5
All Other Helpers, Laborers and Material Movers, Hand	\$20,680	25.70%	49,895	1

Table 5

	Indiana Avg. Annual Salary, 1998	Growth Rate to 2006	Estimated Statewide Employment	Education & Training Level
Marketing, Sales and Promotion			84,004	
Marketing and Sales Worker Supervisors	\$30,280	14.40%	34,559	4
Sales Agents, Selected Business Services.....	\$39,260	32.40%	3,180	2
Other Sales Reps.....	\$39,100	15.40%	24,158	2
Salespersons, Parts	\$22,390	16.20%	8,213	1
All Other Sales and Related Workers	\$22,940	19.10%	13,895	2

UPDATES

Since this study was released, the U.S. Bureau of Labor Statistics has updated its occupational projections to the year 2008. Access is available on the web at: imis.dws.state.ut.us/occ/projhome.asp. There is also a host of national and regional occupational data available from the U.S. Bureau of Labor Statistics (www.bls.gov/empoccl.htm) and the Indiana Department of Workforce Development (www.state.in.us/dwd/inews). For an overview of the population and economy of a county or region in Indiana, go to STATS Indiana at www.stats.indiana.edu.

Table 6

	Indiana Avg. Annual Salary, 1998	Growth Rate to 2006	Estimated Statewide Employment	Education & Training Level
Mechanical Repair and Precision Crafts.....			93,189	
Maintenance Repairers, General Utility	\$23,440	20.90%	30,569	3
Automotive Mechanics	\$27,750	12.70%	14,493	5
Bus and Truck Mechanics and Diesel Engine Specialists.....	\$28,270	10.90%	6,237	3
Mobile Heavy Equipment Mechanics	\$32,080	11.60%	1,312	3
Aircraft Mechanics.....	\$30,280	28.20%	1,613	5
Telephone and Cable TV Line Installers and Repairers.....	\$30,210	19.50%	2,711	3
All Other Electrical/Electronic Equipment Mechanics, Installers, Repairers	\$34,980	10.90%	3,384	3
Heating, Air-Conditioning, and Refrigeration Mechanics and Installers	\$28,030	34.60%	4,130	3
Office Machine and Cash Register Servicers	\$24,590	29.70%	1,313	3
All Other Mechanics, Installers, and Repairers	\$30,750	18.80%	12,423	3
Sheet Metal Workers.....	\$29,720	10.40%	6,021	2
Wood Machinists.....	\$21,410	25.90%	1,339	3
Cabinetmakers and Bench Carpenters.....	\$24,770	20.20%	2,299	3
Furniture Finishers	\$21,410	28.90%	683	3
All Other Precision Woodworkers	\$22,950	32.60%	1,464	3
All Other Precision Workers.....	\$23,320	24.30%	3,198	3

Table 7

	Indiana Avg. Annual Salary, 1998	Growth Rate to 2006	Estimated Statewide Employment	Education & Training Level
Transportation.....			91,525	
Dispatchers Except Police, Fire, and Ambulance	\$29,440	16.00%	2,839	2
Transportation Agents	\$20,290	37.70%	828	1
Truck Drivers, Heavy or Tractor-Trailer.....	\$29,460	23.10%	39,878	1
Truck Drivers, Light.....	\$20,610	27.00%	23,424	1
All Other Transportation Workers.....	\$20,880	15.40%	4,056	2
Industrial Truck and Tractor Operators.....	\$26,150	13.30%	16,066	1
Operating Engineers	\$37,900	24.60%	4,434	2
All Other Material Moving Equipment Operators.....	\$26,410	15.90%	3,913	2

Conclusion

Indiana has well-paying jobs that do not require a four-year college degree. Unemployment has been very low in the state and recent IEDC research has found that there is a skills shortage.² Workers with strong skills are in great demand, especially in growing occupations and industries.

Career advancement and earning a livable wage are goals that can be reached. This research, part of a larger report on "Pathways to a Livable Wage,"³ has identified a number of occupations that pay good wages and have strong growth rates. Detailed snapshots of the focus occupations, by state and by the 12 workforce regions, can be found on the Web at

www.ladders4success.org/research/pathways.html, along with other aspects of the "Pathways to a Livable Wage" project.

References

1. George Silvestri, "Occupational Employment Projections to 2006," *Monthly Labor Review*, 1997, p. 83.
2. Charles R. Warren, "Is There a Job Gap in Indiana? An Updated Analysis" (Indianapolis: Indiana Economic Development Council, 2001).
3. Charles R. Warren, "Pathways to a Livable Wage" (Indianapolis: Indiana Economic Development Council, 2001).

Inside Indiana's Counties: Township Population Changes, 1990 to 2000

Morton J. Marcus

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What does the Census of 2000 tell us about land use within our counties? Are we sprawling out? Is our population growing evenly or unevenly? Here are some answers. They will not satisfy our every concern, but they may provide some indication of what is happening in Indiana's 92 counties.

Here is an overview of what we will be investigating:

- Population growth in Indiana townships between 1990 and 2000.

- Uniformity of growth. A county may grow by 10 percent in population, that growth may be very unevenly distributed around the county. In one extreme case, all the growth is in one township with no change in any of the other townships. Another extreme would have all townships growing at exactly the same rate of increase.

We will use two measures—the range of growth rates and the coefficient of variation to describe how different growth rates were within each county.

- Internal shifts. A county may show no change in population, but there may be considerable shifts of population within the county as some townships grow and others decline.

We will measure those shifts and relate them to the county's population and its change in the 1990s.

- Concentration of population. Despite the different rates of growth, at any one time the population of a county may be concentrated in one or a few townships. This is the typical pattern of our counties, with population concentrated in the county seat and sparse settlements elsewhere in outlying townships.

We will use a concentration index and its changes to see if our county populations are becoming more or less concentrated.

In each of these four sections, we will provide data for each county through visuals and point out which counties show the most or the least growth, uniformity, internal shifts, and concentration of population. (For specific data on these factors for each county, visit www.ibrc.indiana.edu).

Figure 2
Distribution of Townships by Growth Rate, 1990-2000

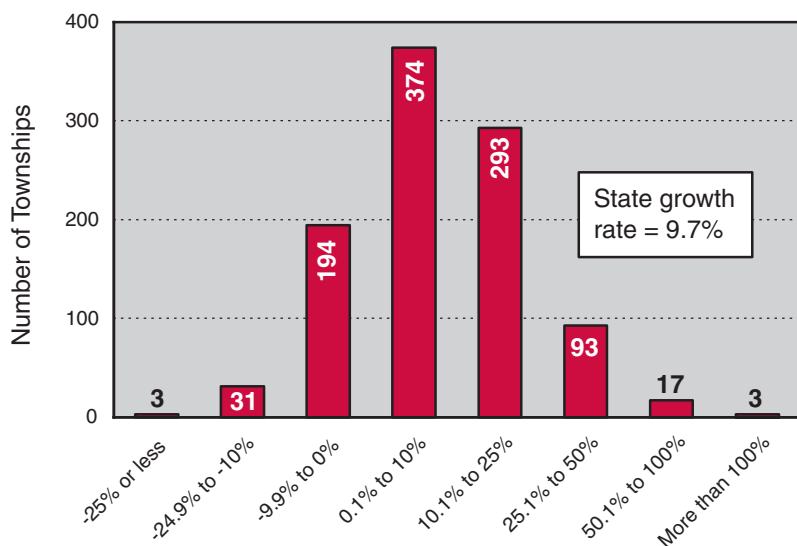
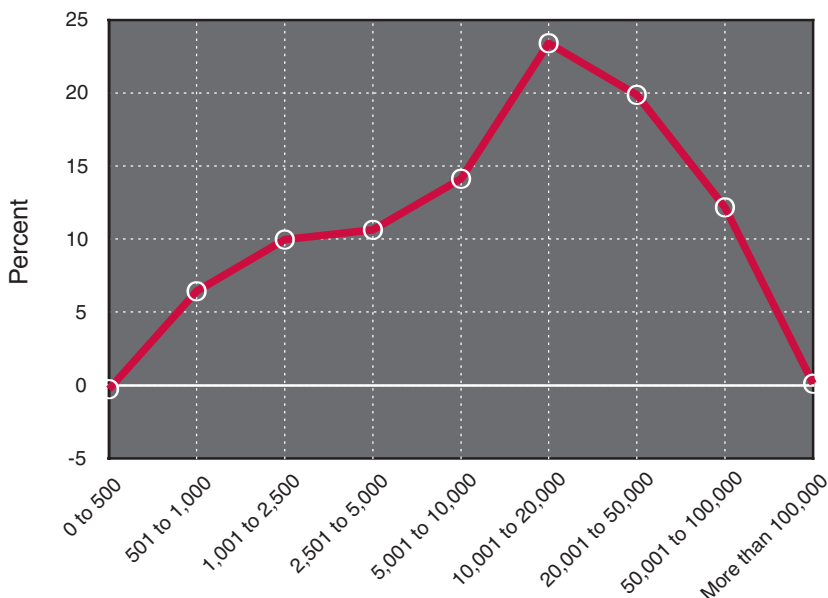


Figure 3
Average Growth Rate by Township Size



Population Growth

Indiana has 1,008 townships. La Porte County has 21 and Allen, 20. Blackford, Brown, and Ohio counties have just four townships each. Seven townships have populations over 100,000, lead by Center Township in Marion County and North Township in Lake County, which each exceeds 165,000. Six of these seven townships are located in Marion and Lake counties. The seventh is Wayne Township in Allen County.

Figure 1 (on the inside back cover) shows the distribution of townships by size in 2000. There were 802 townships with 5,000 or fewer persons. This amounts to 80 percent of all Indiana townships. The

Figure 4
Blackford County Township Growth Rates

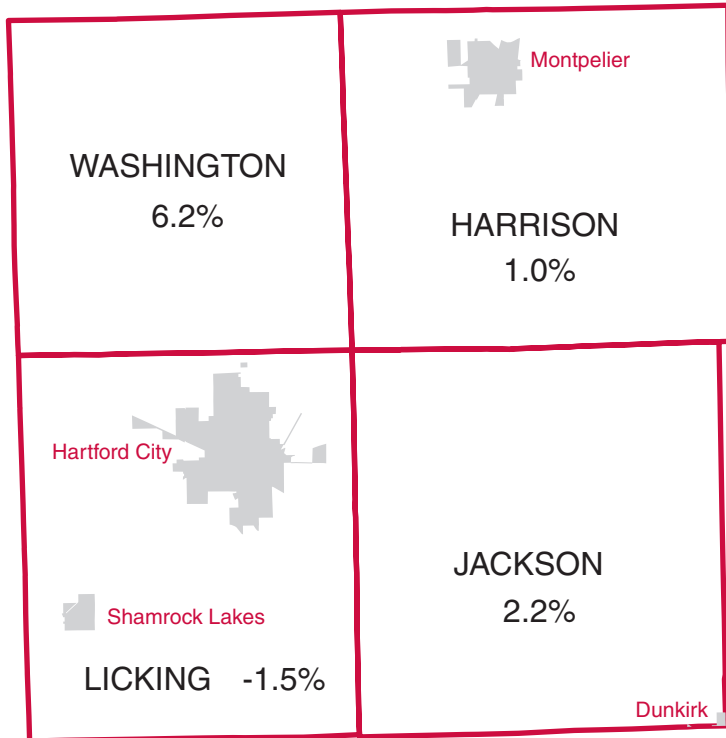
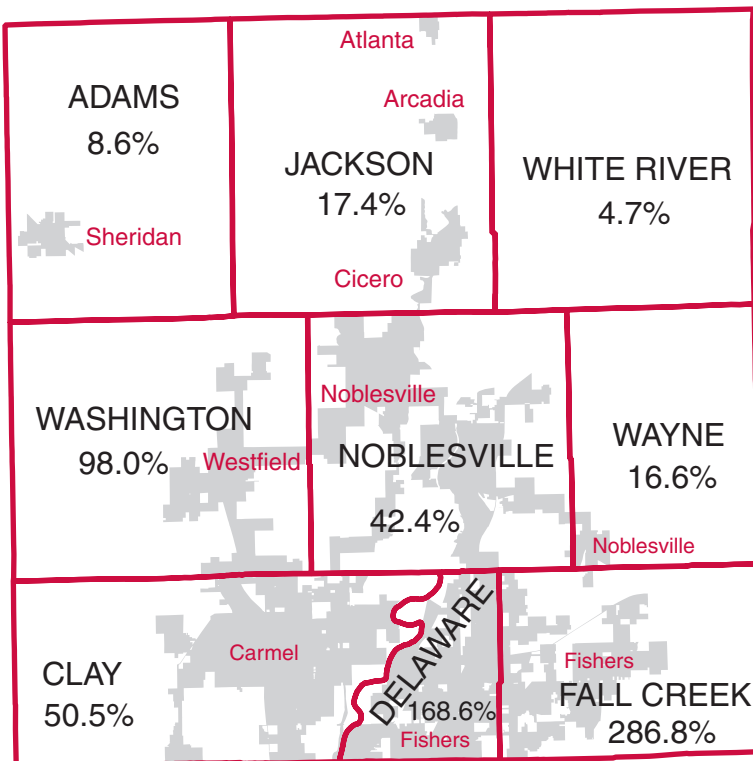


Figure 5
Hamilton County Township Growth Rates



smallest township in Indiana is Wabash in Gibson County with 44 persons. Townships with 1,000 or fewer persons decreased in number from 280 in 1990 to 239 in 2000, while all other size townships grew or remained the same.

Four townships showed no change in population between 1990 and 2000. Declining townships totaled 224, of which three (Clinton Township in Cass County, -50 percent, Washington in Harrison County, -35 percent, and Center in Rush County, -25 percent) lost one-quarter or more of their population. Three of the four fastest growing townships were in Hamilton County, led by Fall Creek Township (287 percent), with Haddon Township in Sullivan County also growing rapidly due to a new prison. **Figure 2** shows the distribution of townships by growth rates.

Townships between 10,000 and 20,000 had the best average population growth rate between 1990 and 2000 (see **Figure 3**). Very small townships and the largest townships showed virtually no growth.

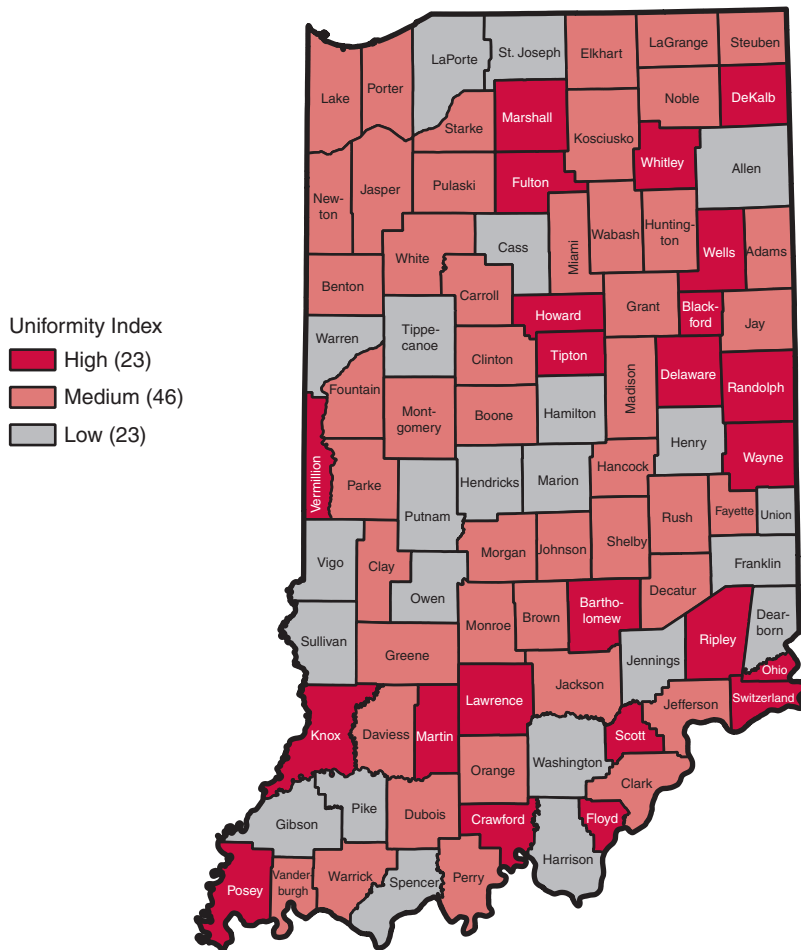
Uniformity of Growth

If all townships grew at the same rate, then the difference between the highest and the lowest growth rates is zero. A broad range of growth rates suggests very different experiences in different parts of the county. A narrow range, by contrast, is likely to mean that the townships were subject to similar forces and factors.

Specifically, how does this matter? Narrowly contained growth at a high rate probably puts more stress on water, sewer, and road systems. It focuses new enrollments in fewer schools. It concentrates the demand for commercial, health care, and public safety services. Broadly dispersed growth may be easier on existing systems, spreading the burden more evenly through the county. It is unclear, without much more information, whether dispersed or concentrated growth is less costly or more advantageous.

No county approached a zero range of population growth rates in 2000. The smallest difference in township growth rates within a county was 7.7 percent in Blackford County, where the highest rate of growth was 6.2 percent in Washington Township and the lowest was -1.5 percent in Licking Township (see **Figure 4**). The greatest difference, by contrast, was in Hamilton County where Fall Creek Township gained 287 percent and White River Township advanced by only 5 percent, for a range of 282 percent (see **Figure 5**). We will refer to these maps again later to illustrate our methods.

Figure 7
Uniformity Index of Townships by County



How much of a shift in population occurred in Blackford County? The total number of persons was 124. They may be imagined as moving from Licking Township into the other three townships. These 124 persons represent 0.9 percent of the 2000 population in Blackford County. The average county in the state had 3 a percent difference in the distribution of its population in 2000 from its 1990 pattern of settlement. Blackford was second lowest in the state in this measure of internal change. Marion County had the greatest internal shift of 44,479, equaling 5.2 percent of its 2000 population, 14th in the state.

However, this shift in population can be assessed differently. Instead of comparing the shift to the 2000 population, it may be compared to the change in population between 1990 and 2000. This is a comparison of change within the context of change and we refer to this as churn.

In Blackford County, with a shift of 124 persons but a total change of only minus 19 persons, the churn ratio was 653 percent, fifth highest in the state. The highest churn ratio was in Martin County at infinity (266 shift over a zero change in population). Vermillion County was second and Vigo third. The lowest churn ratio was 6 percent in Switzerland County, followed by Steuben, Hancock, and Johnson counties (see Figure 8).

Table 1
Township—Uniform or Expected Change Versus Actual Change in Population

Population	1990	2000	Change	Cumulative count			Cumulative percent		Mean growth rate
				1990	2000	Change	1990	2000	
0 to 500	81	76	-5	81	76	-5	8%	8%	-0.3%
501 to 1,000	199	163	-36	280	239	-41	28%	24%	6.4%
1,001 to 2,500	362	371	9	642	610	-32	64%	61%	10.0%
2,501 to 5,000	179	192	13	821	802	-19	81%	80%	10.6%
5,001 to 10,000	87	94	7	908	896	-12	90%	89%	14.1%
10,001 to 20,000	43	48	5	951	944	-7	94%	94%	23.4%
20,001 to 50,000	40	42	2	991	986	-5	98%	98%	19.9%
50,001 to 100,000	10	15	5	1001	1001	0	99%	99%	12.2%
More than 100,000	7	7	0	1008	1008	0	100%	100%	0.1%

Statewide, this intra-county township shift equaled nearly 252,700 persons, about 3 percent of Indiana's population in 2000, and gave us a churn ratio of 47 percent. There seems to be little relationship between the rate of growth in a county and its churn ratio.

Concentration of Population

Lack of uniformity (disparities in growth rates) shifts the balance of population within a county. Which brings us to the issue of sprawl. What is sprawl? We may presume that it is a decrease in the concentration

of population. Thus, with a shift of population from Licking Township to the other townships, Blackford County experienced sprawl in the 1990s.

In 1990, Blackford County had a concentration index² of 26.8. If the value had been 100, it would have meant that all the people of the county lived in one township. A value of zero would have meant that the population was perfectly distributed among the townships. In 2000, the concentration index for Blackford County was 25.6; hence, there was a decrease in concentration of 1.2 units. In 1990, Blackford had the 14th most concentrated population among the state's 92 counties. In 2000, it had slipped to 15th most concentrated.

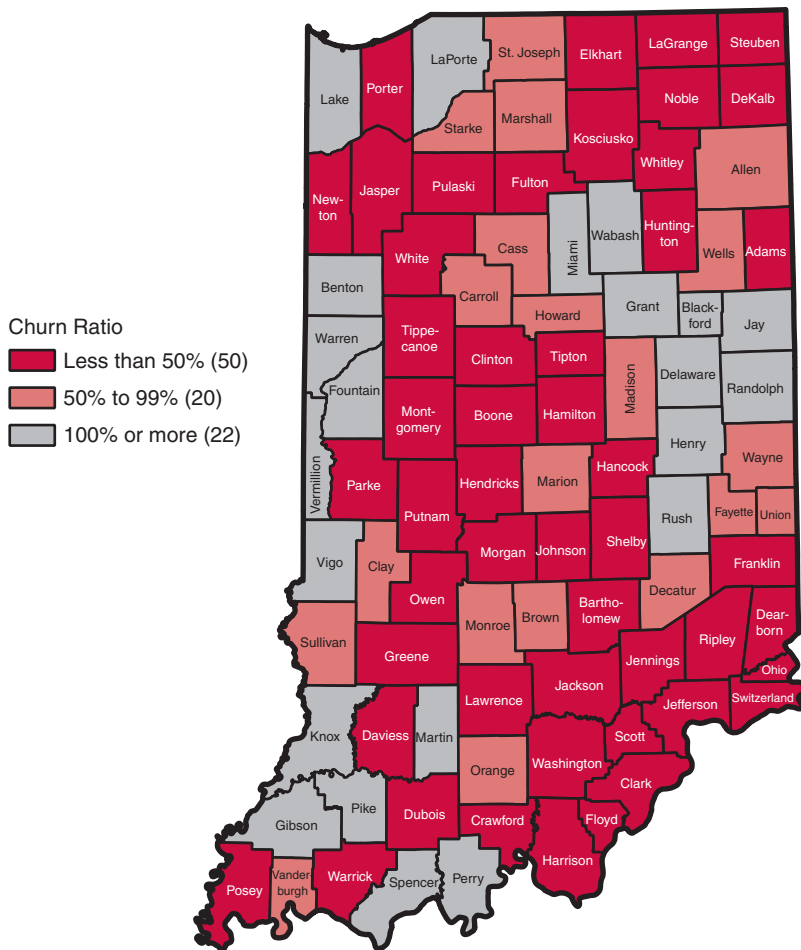
For perspective, the most and least concentrated Indiana counties in 2000 are shown in **Figure 9**. The 15 counties that had become more concentrated are shown with an up arrow (↑) and the 37 counties that became less concentrated are shown with a down arrow (↓). Forty counties in which the change in concentration was less than plus or minus 1.0 are shown without any sign.

Sprawl, as measured by decline in concentration was greatest in Perry and Ohio counties, followed by St. Joseph, Allen, Delaware, Tippecanoe, and Howard. By contrast, suburban counties (Johnson, Boone, and Shelby) in the Indianapolis metro area became more concentrated. The greatest degree of increased concentration could be found in Warrick, Jackson, and Cass counties.

Deconcentration of population continued in Marion County, which was already the 87th least concentrated county in 1990. By 2000, Marion was exceeded in "sprawl" only by Lagrange County. Would anyone consider Lagrange County afflicted with sprawl? Of course not! The pattern of residential settlement in Lagrange County is the prototypical rural area with a few small towns to serve a self-sufficient farm population. Marion County, however, has the same widespread residential settlement pattern. The difference is that the population density in Marion County is 2,011 persons per square mile while it is only 78 in Lagrange County.

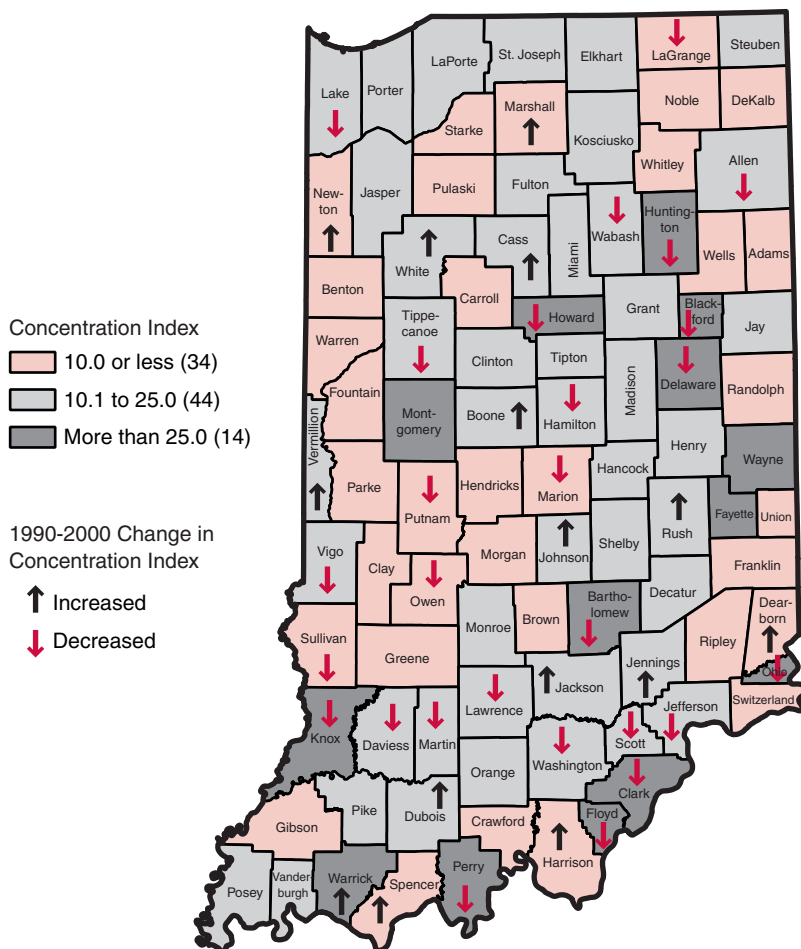
Are greater or lesser degrees of concentration and population density to be desired? That may be a function of preferences more than costs. But we know little of either preferences or costs. Life-long national subsidies for owner-occupied single-family dwellings encourage people toward more deconcentrated (lower density) developments. Ignorance of the cost differential between high and low density residential

Figure 8
Churn Ratio for Townships, by County



patterns leads the anti-sprawl crowd to bemoan continuing deconcentrated settlements. That same ignorance, a few generations back, lead the anti-urban, fresh air folks to decry city life and support the suburban pattern we see today.

Figure 9
Concentration of Population in 2000—Most and Least



Summary

- In 2000, 80 percent of all Indiana townships (802 or 1008) had 5,000 or fewer persons.
- 224 townships declined in population from 1990 to 2000, four showed no change, while the remaining 908 gained in population.
- Very small townships and the largest townships showed virtually no growth.
- No Indiana county had a uniform rate of population growth. Hamilton County had the greatest difference between its fastest and slowest growing townships. Blackford County had the least such difference.
- Marion County had the greatest internal shift of population (44,479) equaling 5.2 percent of its 2000 population, 14th in the state.
- The highest churn ratio (shift divided by change) was in Martin County at infinity (266 shift over a zero change in population). Vermillion County was second and Vigo third. The lowest churn ratio was 6 percent in Switzerland County, followed by Steuben, Hancock, and Johnson counties.
- 15 counties became more concentrated in their populations while 37 had less concentration. The remaining 40 counties showed little change in concentration.
- Sprawl remains an ambiguous concept and no measures seem to reflect whether concentrated or deconcentrated settlement patterns are to be sought by policy makers.

Notes

1. Z-values were constructed for each variable using the mean and standard deviation values of each county. These were then summed to provide an index of uniformity. The lower the values of the range and the coefficient of variation in population growth rates, the lower the resulting z-values. Hence, a negative summed z-value indicates a county with more uniformity than a county with a positive z-value. A uniformity index value of zero would indicate a county that is average in both its range and coefficient of variation in growth rates.
2. The concentration index is the sum of the squared percentages of population in each township. It is reported here adjusted for the number of townships in each county.

Excel worksheets with all of the data used for this article can be found on the Indiana Business Research Center's website at www.ibrc.indiana.edu—go to the *Indiana Business Review* section.

Census 2000 in Indiana

Distribution of Population by Township

Three-fourths of Indiana's 1,008 townships have a population of 5,000 or less.

The smallest township:

- Wabash in Gibson County (population 44)

The largest townships:

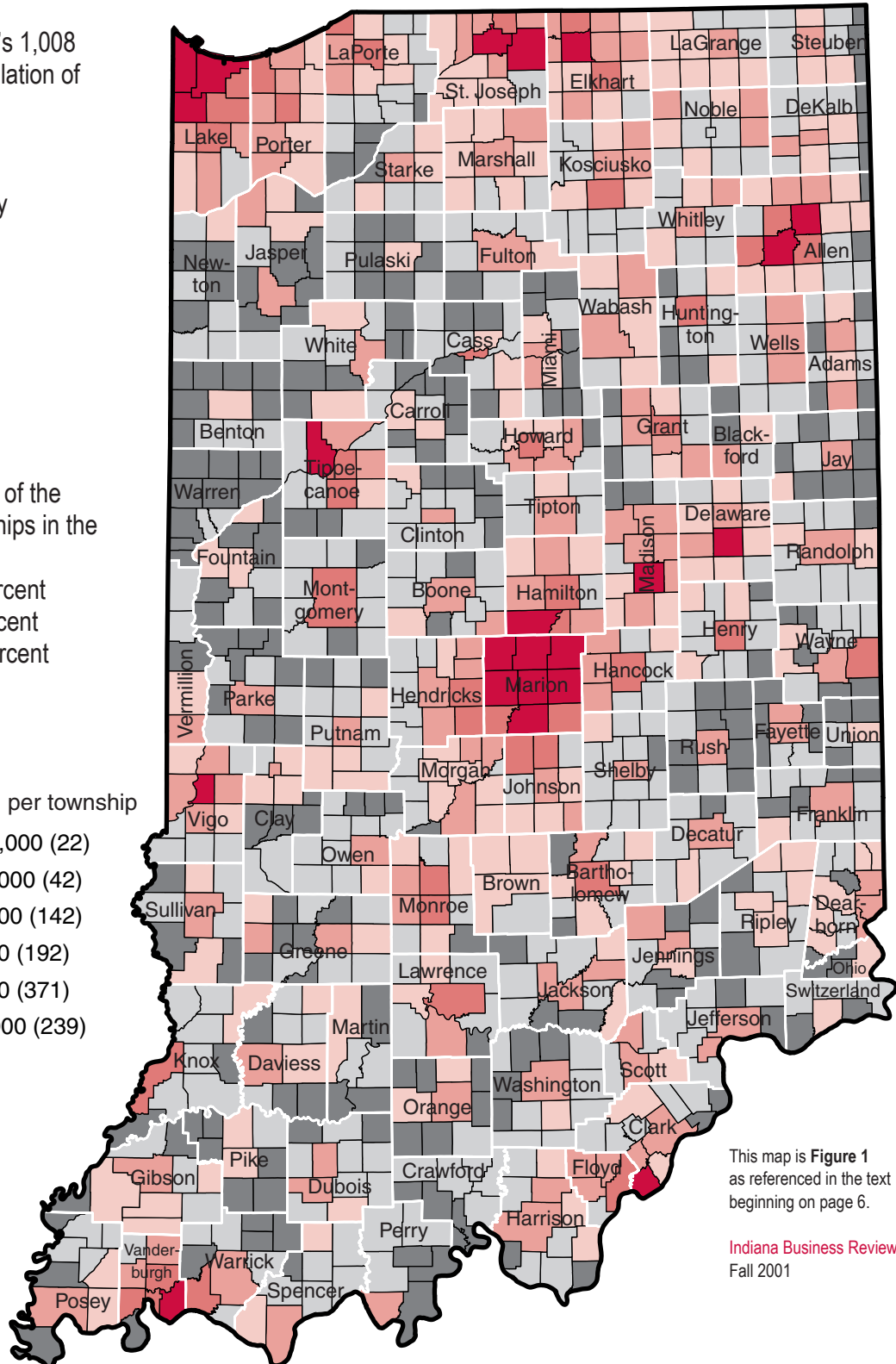
- Center in Lake County (population 167,055)
- North in Lake County (population 165,656)

Hamilton County has three of the four fastest-growing townships in the state:

- Fall Creek: 287 percent
- Delaware: 169 percent
- Washington: 98 percent

Range of population per township

- More than 50,000 (22)
- 20,001 to 50,000 (42)
- 5,001 to 20,000 (142)
- 2,501 to 5,000 (192)
- 1,001 to 2,500 (371)
- Less than 1,000 (239)



This map is **Figure 1** as referenced in the text beginning on page 6.

Inside:

- **Good Paying Jobs Without a Four-Year Degree**
- **Change, Churn and Concentration Within Indiana's Counties**

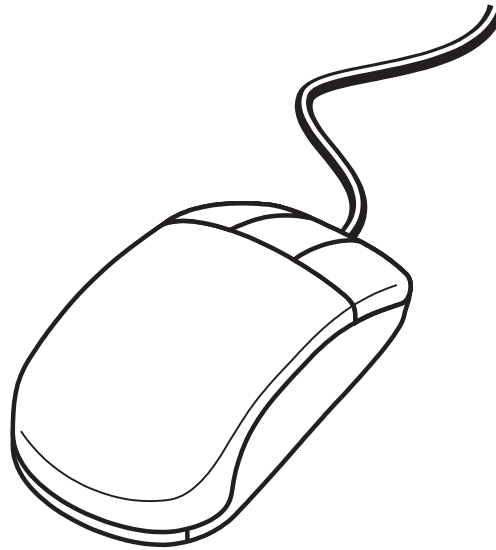
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