

State of the

# IT INDUSTRY

2015 Guide



INFORMATION TECHNOLOGY COUNCIL  
OF NORTH DAKOTA

# The State of North Dakota's IT Industry

It is no doubt an exciting time to be in North Dakota. The state is topping all sorts of lists regarding economy and quality of life.

It also is an opportune time to be involved in the information technology (IT) industry, which has seen three times the nation's job growth over the past decade. Entrepreneurs and start-up businesses are locating in North Dakota due to the state's commitment to IT infrastructure, education and business-friendly incentives.

With technology changing faster than ever and new technologies quickly adopted across the globe, it's now easier for IT businesses to share information and follow entrepreneurial visions right here in North Dakota. The state's IT industry is showing the nation its thriving opportunities for IT businesses and professionals.

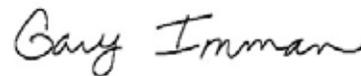
IT is an integral component in all of the state's industries, and it is evident the IT industry will continue to prosper in North Dakota. In order to keep up with workforce needs, it is essential that partnerships continue with industry, education and government. It is also vitally important that the state maintains and continues to enhance its IT infrastructure and business-friendly incentives.

In a cooperative effort to share the status of North Dakota's IT industry, the Information Technology Council of North Dakota, along with the sponsors below, is pleased to present the 2015 *State of the IT Industry Guide*. The Guide is an assessment of North Dakota's IT industry in the areas of infrastructure, workforce, trends, competitiveness, and economic impact on the state.



This publication is a valuable tool in informing community partners in private and public sectors and potential business prospects about opportunities within North Dakota's IT industry. We hope it will be an important resource for you and your organization.

ITCND's mission is to actively encourage the use, growth and development of IT in North Dakota. We are continually looking for new ways to advance that mission and would welcome your input. Feel free to contact me at [inmangary@hotmail.com](mailto:inmangary@hotmail.com) or 701-371-1563 or ITCND Executive Director Deana Wiese at [office@itcnd.org](mailto:office@itcnd.org) or 701-355-4458.



Gary Inman, President  
Information Technology Council of North Dakota

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# Introduction

The information technology (IT) industry in North Dakota plays an important role in the state's economy. In addition to the contribution of IT businesses, IT is vital to virtually every business, government, education, or nonprofit entity across the state, nation and world.

This biannual report showcases the impact of the state's IT sector and identifies opportunities and challenges within the IT industry. The data was collected by ITCND in partnership with Job Service North Dakota and supplemented by the results of surveys of the ITCND membership. The information throughout the report refers to the North Dakota American Industry Classification System (NAICS) and the Occupational Information Network (O\*NET).

For the purpose of this report, the North Dakota IT sector includes businesses classified within NAICS 51 – Information and NAICS 54 – Professional, Scientific and Technical Services. References made to the North Dakota IT subsectors include NAICS 511 – Publishing Industries (except Internet); NAICS 517 – Telecommunications; NAICS 518 – Data Processing, Hosting and Related Services; NAICS 519 – Other Information Services; and NAICS 541 – Professional, Scientific and Technical Services (Table 1).

ITCND, along with its sponsors, is pleased to present the 2015 edition of the *State of the IT Industry Guide*, which provides a snapshot of North Dakota's IT industry, including the economic impact to the state; the status of the IT workforce and infrastructure; the competitiveness of the industry at the regional and national level; and the key industry trends.

[ Table 1 ]

## IT Industry Breakdown

### North Dakota IT Sector (NAICS)

- 51 – Information
- 54 – Professional, Scientific and Technical Services

### North Dakota IT Subsectors (NAICS)

- 511 – Publishing Industries (except Internet)
- 517 – Telecommunications
- 518 – Data Processing, Hosting and Related Services
- 519 – Other Information Services
- 541 – Professional, Scientific and Technical Services

### North Dakota IT Occupations (O\*NET)

- 11-3021 – Computer and Information Systems Managers
- 15-1122 – Information Security Analysts
- 15-1131 – Computer Programmers
- 15-1132 – Software Developers, Applications
- 15-1133 – Software Developers, Systems Software
- 15-1134 – Web Developers
- 15-1141 – Database Administrators
- 15-1142 – Network and Computer Systems Administrators
- 15-1143 – Computer Network Architects
- 15-1151 – Computer User Support Specialists
- 15-1152 – Computer Network Support Specialists
- 15-1199 – Computer Occupations, All Other
- 25-1021 – Computer Science Teachers, Postsecondary

Source: Job Service North Dakota

# Executive Summary

North Dakota's booming economy has brought tremendous growth and prosperity over the past five years. The state ranks first in many income, economic and population growth measures. However, great opportunity lies in further diversifying the state's economy for a strong, stable economy well into the future. The IT industry is one of those great opportunities.

With job growth in North Dakota's IT subsectors nearly tripling that of the nation over the past decade, the industry continues to be a growing and vibrant part of the state's economy. Entrepreneurs and start-up IT businesses are looking at North Dakota and recognizing the state's commitment to IT infrastructure, education and business-friendly incentives.

The state's IT subsectors employ 21,760 people at more than 3,280 IT-related businesses. These businesses contribute nearly \$2.5 billion to the state's gross domestic product. Of those 21,760 employees, 3,080 are employed in IT occupations with the remaining employed in areas such as accounting, human relations and management. An additional 2,880 North Dakotans hold IT occupations in other industries, such as energy, health care and finance, for a total of 5,960 IT employees.

The average annual wage for IT positions in North Dakota is \$60,750, which is 36% higher than the state average. However, North Dakota wages for IT professionals still lag behind surrounding states and the nation, with wages increasing at a similar rate as national wages over the past 10 years.

With the growing economy, workforce continues to be the primary challenge for the IT industry. North Dakota has seen an increase of nearly 20% in IT occupations over the past decade and is projecting a 45% increase for the next decade. Between 2012 and 2022, it is estimated more than 2,700 new and replacement IT positions will be needed in North Dakota. Growth in the industry will create the need for nearly 1,550 employees to fill new positions, and the remaining positions will be replacements. With the state IT industry currently employing 5,960 North Dakotans, this projected growth means replacement and new positions will equal 45% of the state's current IT workforce.

In an effort to address this issue, industry, government and education stakeholders are collaborating to inform students about the IT career opportunities and potential education pathways to secure these positions. North Dakota currently offers an IT Career Awareness Program, internship opportunities, more than 60 post-secondary education programs, and a loan forgiveness program.

The ever-changing environment of the IT industry creates ongoing opportunities and challenges. IT leaders statewide have identified workforce as the top state trend impacting their business or organization. Nearly 60% indicated workforce needs are not being met due to shortage of available general workforce and lack of skills in available workforce.

Convergence of technologies and services, smart phones and software as a service are other state and national trends impacting their business. The state is well positioned to take advantage of the opportunities and address the challenges presented by these emerging trends due to the cooperation among North Dakota's industry, government and education entities.

IT continues to play a vital role in North Dakota's economy, and the future of the industry is bright. As the industry continues to evolve, collaboration at the state and federal level will allow North Dakota's IT industry to remain a strong competitor in the global economy.

# Economic Impact

North Dakota's diverse IT industry contributes significantly to the state's overall growth and economic strength. More than 3,280 businesses within the IT subsectors employ 21,760 North Dakotans in various fields, including IT, human relations, finance, and marketing.

Agriculture, health care, energy, manufacturing, and financial services are all impacted by IT, which plays a key role in enhancing the productivity and growth of these and many other industries. The IT industry also generates tax revenue for both local and state governments.

Three critical elements speak directly to the impact of IT on the state:

- IT businesses are knowledge-based and create a significant number of high-paying jobs.
- The IT industry is categorized as a primary sector, meaning it brings outside dollars into the state.
- Technology industries on average generate higher-added value per worker than non-technology industries.

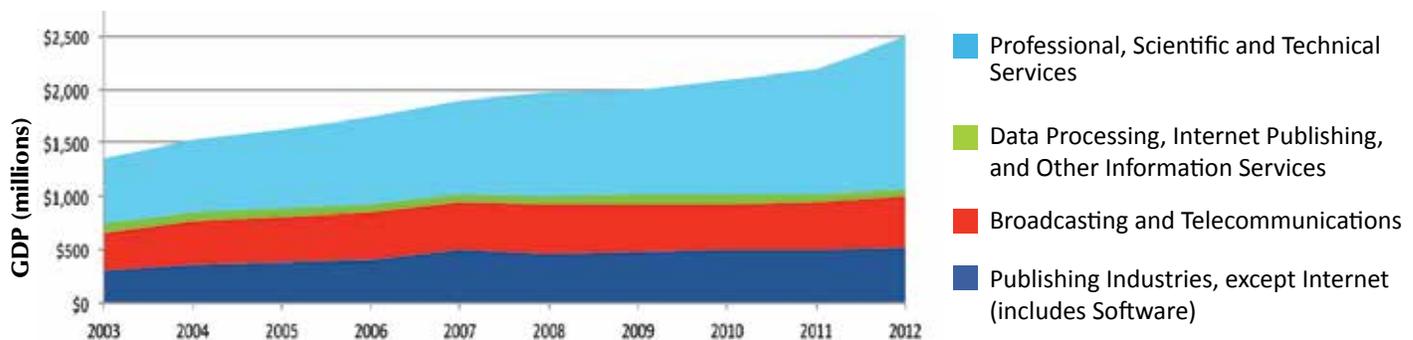
## Gross Domestic Product Contributions

Gross domestic product (GDP) is defined as the total market value of all goods and services produced within a state and is one of the measures of income and output for the state's economy. It is considered the sum of the value added at every state of production.

Between 2003 and 2012, the contribution of the IT subsectors to the state's GDP grew 64%. The IT subsectors are responsible for 5% of the state's total \$49.5 billion GDP, with contributions of nearly \$2.5 billion.

[ Figure 1 ]

## GDP: IT Subsectors (2003 - 2012)

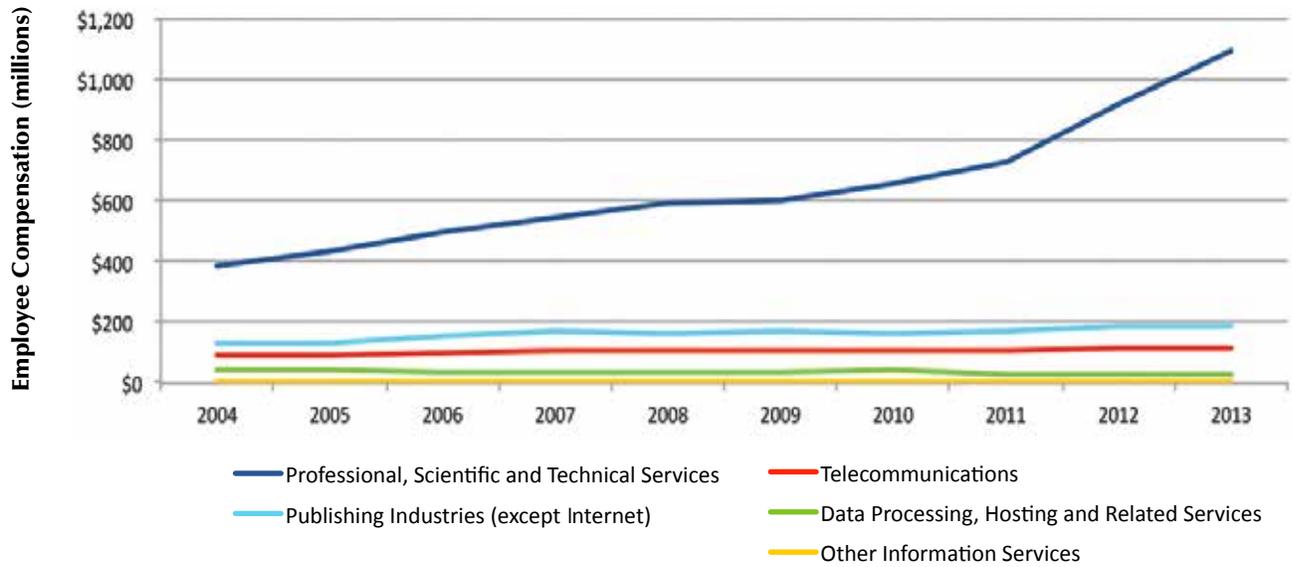


Source: U.S. Bureau of Economic Analysis, U.S. Department of Commerce

**Pay Contributed to the Economy**

In 2013, the 21,760 jobs in the IT subsectors contributed to the state’s economy through \$1.4 billion in total employee compensation. This is a 119% increase over the past decade (Figure 2).

[ Figure 2 ] Employee Compensation Contributed to the Economy (2004 - 2013)



Source: U.S. Bureau of Economic Analysis, U.S. Department of Commerce

Also on a steady incline over the past decade is the average pay for those employed in the IT subsectors (Table 2). In 2013, the average annual wage for IT occupations was \$60,750, while the average annual wage for all occupations was \$42,410.

[ Table 2 ] Average Pay (2004 - 2013)

NAICS	Subsectors	2004	2013	% Increase
511	Publishing Industries (except Internet)	\$46,842	\$65,827	41%
517	Telecommunications	\$47,756	\$64,344	35%
518	Information and Data Processing Services	\$35,885	\$41,542	16%
519	Other Information Services	\$19,696	\$28,150	43%
541	Professional, Scientific and Technical Services	\$35,638	\$67,241	89%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

**IT Subsector Job Growth**

Employment in the state's and nation's IT subsectors continued to see positive growth. There was a 29.5% increase in employment in North Dakota's IT subsectors between from 2004 to 2013, while the nation experienced a 11% increase in IT subsector employment (Table 3).

[ Table 3 ]

**IT Subsector Job Growth (2004 - 2013)**

Subsector	2004 US	2013 US	2004 ND	2013 ND	US %	ND %
					Change	Change
Publishing Industries (except Internet)	907,885	728,612	2,833	2,783	-19.7%	-1.8%
Data Processing, Hosting and Related Service	387,047	270,168	1,187	673	-30.2%	-43.3%
Professional, Scientific and Technical Service	6,886,073	8,227,711	10,745	16,300	19.5%	51.7 %
Telecommunications	1,028,087	851,030	1,880	1,801	-17.2%	-4.2%
Other Information Services	182,675	328,213	166	210	79.7%	26.3%
<b>Total</b>	<b>9,391,767</b>	<b>10,405,734</b>	<b>16,810</b>	<b>21,766</b>	<b>10.8%</b>	<b>29.5%</b>

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

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# Infrastructure

Despite having one of the lowest population densities in the nation, North Dakota continues to be at the forefront of offering broadband services to even the most rural communities in the state. According to the North Dakota Association of Telephone Cooperatives, more than 95% of the state's population has access to broadband services.

North Dakota's broadband infrastructure has made significant advances in recent years. Service providers have invested hundreds of millions of dollars deploying fiber to rural areas across the state. For example, Dakota Carrier Network and the independent telephone companies have more than 40,000 miles of fiber optic facilities offering Gigabit Ethernet, DSL and cable-based internet access. Century Link also has a major fiber footprint in the state with connections to its advanced fiber optic network. This network spans more than 173,000 route miles globally. Century Link offers its Century Link Metro Optical Ethernet services for businesses in Bismarck and Fargo and has more than 300 remote terminals for DSL throughout North Dakota.

Consumers in the state can choose from Dakota Carrier Network, Century Link, Midcontinent Communications, or the local independent telephone company for their broadband needs.

The North Dakota state government has recognized the importance of a robust IT infrastructure in order to compete in today's global economy. It created the Information Technology Department to provide effective and efficient state-of-the-art services to serve education, agencies and public safety groups throughout the state. Education and public services benefit from the foresight of creating this key state department.

Broadband infrastructure is one of the Obama Administration's sectors of business targeted with the stimulus program. To date, North Dakota service providers have been awarded more than \$100 million to improve the state's broadband infrastructure. Recipients include: BEK Communications, Dakota Central Telecommunications, Dakota Carrier Network, SRT Communications, Consolidated Telcom, Moore & Liberty Telephone, Griggs Telephone Company, Red River Telephone, and Reservation Telephone. These companies are installing fiber optic-based infrastructure in their territories, enabling customers to have access to the most state-of-the-art broadband service.

The fiber backbone serving North Dakota is supported by multiple Dense Wavelength Division Multiplexing (DWDM) rings, offering 10, 40 and future 100 Gigabit speeds. Redundancy has been built into every corner of the state. The state of North Dakota is served by multiple fiber optic backbone rings that provide broadband access to every K-12 school, state agency and hospital in the state.

## **Dakota Fiber Initiative**

ITCND, in cooperation with private and public sector stakeholders, launched the Dakota Fiber Initiative (DFI) in October 2013. The purpose is to "provide affordable, world-class internet speed and reliability to every individual in the state of North Dakota." Although North Dakota currently has significant bandwidth coverage across the state, issues of inadequate speed, affordability of adequate speed and assurance that capacity can meet future demands still need to be addressed.

To ensure that North Dakota remains at the top of the nation in broadband availability, speed and affordability, DFI partners continue to assess the state's broadband status, pursue policy to increase broadband infrastructure and educate stakeholders on the benefits of high-speed broadband. Additional information on the initiative is available at [www.itcnd.org](http://www.itcnd.org).

# Status of the Workforce

North Dakota's economy is leading the nation thanks to numerous successful industries, including IT. The state consistently boasts one of the lowest unemployment rates in the country and offers many opportunities for business start-ups and expansions. Through the cooperative efforts of industry, government and education, potential in- and out-of-state employees are also kept well-informed of the great jobs that exist in North Dakota's IT industry.

North Dakota's five IT subsectors employ 21,760 individuals, and these subsectors include the state's IT businesses. Of these jobs, 14% (3,080) are IT positions and the remaining jobs are in areas such as accounting, sales and marketing. In numerous other industries, including health care, energy, education, and government, an additional 2,880 North Dakotans hold IT occupations. When combined with 3,080 IT employees in the IT industry, the total number of North Dakota IT professionals is 5,960 (Table 4). The annual average wage for IT positions is \$60,750 – 36% higher than the state average.

[ Table 4 ]

## IT Occupations (2013)

O*NET	Occupation	Number of Employees
11-3021	Computer and Information Systems Managers	490
15-1122	Information Security Analysts	140
15-1131	Computer Programmers	320
15-1132	Software Developers, Applications	1,020
15-1133	Software Developers, Systems Software	660
15-1134	Web Developers	190
15-1141	Database Administrators	130
15-1142	Network and Computer Systems Administrators	510
15-1143	Computer Network Architects	150
15-1151	Computer User Support Specialists	1,430
15-1152	Computer Network Support Specialists	470
15-1199	Computer Occupations, All Other	380
25-1021	Computer Science Teachers, Postsecondary	70
	<b>Total</b>	<b>5,960</b>

Source: Occupation Employment Statistics, Job Service North Dakota

### Leading Subsectors for IT Employees

Between 2004-2012, the professional and technical services subsector had 1,390 employees and was the subsector with the most North Dakota IT employees. Publishing industries except internet followed with 720 employees, and insurance carriers and related activities was the third largest subsector with 620 employees.

Telecommunications was the subsector with the largest percentage of IT employment growth between 2004-2012 (300%). Administrative and support services followed in the largest percentage of IT employment growth (244%), and data processing, hosting and related services showed the third largest percentage of growth (103%).

[ Table 5 ]

## IT Subsector Employment Change (2004 - 2012)

NAICS	Subsector	2004	2012	Number Change	% Change
517	Telecommunications	90	360	270	300.0%
561	Administrative and Support Services	90	310	220	244.4%
518	Data Processing, Hosting and Related Services	300	610	310	103.3%
524	Insurance Carriers and Related Activities	420	620	200	47.6%
611	Educational Services	420	610	190	45.2%
541	Professional and Technical Services	1,030	1,390	360	35.0%
551	Management of Companies and Enterprises	460	600	140	30.4%
334	Computer and Electronic Product Manufacturing	210	260	50	23.8%
992	State Government (excluding Education and Hospitals)	420	500	80	19.0%
511	Publishing Industries (except Internet)	730	720	-10	-1.4%

Source: Job Service North Dakota

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[ Table 6 ]

## Change in IT Occupations (2004 - 2013)

O*NET	Occupation	2004	2013	Number Change	% Change
11-3021	Computer and Information Systems Managers	510	490	-20	-3.9%
15-1131	Computer Programmers	660	320	-340	-51.5%
15-1132	Software Developers, Applications	470	1,020	550	117.0%
15-1133	Software Developers, Systems Software	460	660	200	43.5%
15-1141	Database Administrators	170	130	-40	-23.5%
15-1142	Network and Computer Systems Administrators	420	510	90	21.4%
15-1143	Computer Network Architects	260	150	-110	-42.3%
15-1151	Computer User Support Specialists	1,040	1,430	390	37.5%
15-1199	Computer Occupations, All Other	230	380	150	65.2%
25-1021	Computer Science Teachers, Postsecondary	110	70	-40	-36.4%
<b>Total</b>		<b>4,330</b>	<b>5,160</b>	<b>830</b>	<b>19.2%</b>

Source: Job Service North Dakota



Information technology is one of the fastest growing job sectors in North Dakota. Bismarck State College's IT programs will prepare students to join this exciting industry.

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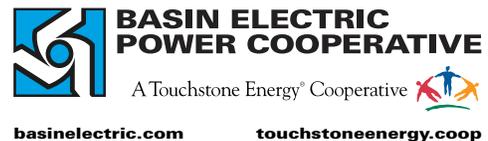


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## IT Occupations

The number of North Dakotans holding IT occupations totals more than 5,960 and the number of jobs has grown by 19% between 2004-2013. The growth, both in number and percent, was shown in the occupations of software developers, applications; computer user support specialists; software developers, systems software; and computer occupations, all others (Table 6).

## Employee Concentration

The number of employees in North Dakota's IT subsectors totals 21,670, and the largest concentration of workers is found in the following counties: Cass (7,989), Burleigh (3,750), Grand Forks (1,747), Ward (1,251), and Williams (1,151).

## Projected IT Workforce Needs

Between 2012 and 2022, it is estimated more than 2,700 new and replacement IT positions will be needed in North Dakota. Growth in the industry will create the need for nearly 1,550 employees to fill new positions. The remaining positions will be replacements.

The state's IT industry currently employs 5,960 North Dakotans, and this projected growth means replacement and new positions will equal 45% of the state's current IT workforce. Information security analyst is the IT occupation with the highest percentage of projected growth (3.7%). Software developers, systems software (2.7%) and computer user support specialists (2.3%) are the IT occupations with the second and third highest percentage of growth.

Through 2022, the three IT occupations projected to have the largest number of openings include computer user support specialists with 780 projected openings, software developers, applications with 363 openings, and software developers, systems software with 334 openings (Table 7).

[ Table 7 ]

## Projected IT Workforce Needs (2012 - 2022)

IT Occupations	% Growth	Number of Openings	Annual Average Wage	High Wage	High Demand	High Skill	Growth Openings	Replacement Openings
Computer and Information Systems Managers	1.7%	192	\$98,160	Y	Y	Y	111	81
Computer Systems Analysts	1.5%	259	**	Y		Y	131	128
Information Security Analysts	3.7%	145	\$60,440	Y	Y	Y	107	38
Computer Programmers	0.4%	138	\$53,850			Y	19	119
Software Developers, Applications	2.0%	363	\$62,220	Y	Y	Y	231	132
Software Developers, Systems Software	2.7%	334	\$64,980	Y	Y	Y	235	99
Web Developers	1.8%	103	\$47,300	Y		Y	57	46
Database Administrators	1.8%	73	\$67,500	Y	Y	Y	37	36
Network and Computer Systems Administrators	1.3%	163	\$64,780	Y	Y	Y	76	87
Computer User Support Specialists	2.3%	780	\$45,330	Y			486	294
Computer Network Support Specialists	0.9%	131	\$56,910				47	84
Computer Science Teachers, Postsecondary	1.3%	31	\$67,810		Y		15	16
<b>Total</b>		<b>2,712</b>					<b>1,552</b>	<b>1,160</b>

Source: Job Service North Dakota

# Expanding & Attracting Business

North Dakota's thriving business climate has received extensive national recognition and has contributed greatly to the state's strong economy. Many programs and incentives are now available to North Dakota IT businesses looking to grow or expand, businesses looking to locate within the state and innovative entrepreneurial ventures.

## **North Dakota Department of Commerce • [www.ndcommerce.com](http://www.ndcommerce.com)**

**Research ND** promotes the development and commercialization of products and processes through industry and university research partnerships. Research ND provides matching funds to help companies pay for university research, and projects are initiated by the companies to meet their own research and development goals. Through Research ND, firms have the opportunity to leverage their research, development and commercialization funds and gain access to the creative talents and extensive research base of North Dakota's research universities. Research ND matching funds are awarded on a competitive basis for projects based on proposals submitted jointly by researchers from a North Dakota research university and a private sector partner. More information about the program can be found at [www.ResearchND.com](http://www.ResearchND.com).

**Innovate ND** offers important educational assistance for entrepreneurs and the entrepreneurial community to help people with innovative ideas to build a business. Innovate ND accepts current and former North Dakotans, as well as entrepreneurs, who want to turn great ideas into a business venture in the state. The future of North Dakota depends on the passion of entrepreneurs to create ideas that can become profitable and produce value in the marketplace. More information about the program can be found at [www.InnovateND.com](http://www.InnovateND.com).

**Technology-Based Entrepreneurship Grant Program** provides funds to entrepreneurial centers to aid the growth of tech-based business in North Dakota. Entrepreneurial centers provide business incubator services such as mentors, marketing assistance, accounting/financial management, training, and more to individuals working to develop their business ideas. The grant program provides program grants, which target entrepreneurial centers that provide assistance to multiple technology-based entrepreneurs, and project grants, targeted at individual technology-based entrepreneurs to assist in business efforts. These grants are awarded in four main areas: access to capital, marketing assistance, entrepreneur infrastructure, and entrepreneurial talent.

## **North Dakota Tax Department • [www.nd.gov/tax](http://www.nd.gov/tax)**

North Dakota's income and sales tax incentives are some of the most aggressive in the nation, offering tax incentive programs that encourage business development, expansion and research and provide the strong economic climate and workforce that draws companies to North Dakota.

**Angel Fund Investment Credit** provides individuals, estates, trusts, and corporations an income tax credit for investing in an angel fund certified by the North Dakota Department of Commerce Division of Economic Development and Finance. The credit is equal to 45% of the investment, up to a maximum of \$45,000 per year and a lifetime maximum of \$500,000 per taxpayer.

**Computer and Telecommunications Equipment Sales Tax Exemption** provides primary sector businesses (other than manufacturers and recyclers) with a sales tax exemption on the purchase of computer and telecommunications equipment. The equipment must be an integral part of a new primary sector business or create an economic expansion of an existing business and does not extend to the purchase of replacement equipment. The primary sector business must be certified by the North Dakota Department of Commerce Division of Economic Development and Finance.

**Research Expense Credit** provides an individual, estate, trust, partnership, corporation, or limited liability company an income tax credit for conducting research in North Dakota. The credit is equal to a percentage of the excess of qualified research expenses in North Dakota over the base amount in the state.

**Telecommunications Infrastructure Sales Tax Exemption** provides a sales use and tax exemption through June 30, 2017, for the purchase of tangible personal property used to construct or expand telecommunications service infrastructure within the state. To qualify, the property has to be incorporated into a telecommunications service infrastructure owned by a telecommunications company.

**Wage and Salary Credit** provides an income tax credit to a corporation organized in North Dakota and doing business in North Dakota for the first time. The corporation must be engaged in the assembling, fabricating, manufacturing, mixing, or processing of an agricultural, mineral or manufactured product. The credit is equal to one percent of the wages and salaries paid during the tax year for each of the first three tax years of operation, and a half-percent of wages and salaries paid during the fourth and fifth tax years.

**Workforce Recruitment Credit** provides an individual, estate, trust, partnership, corporation, or limited liability company an income tax credit for employing extraordinary recruitment methods and hiring employees for hard-to-fill positions in North Dakota. The credit is equal to 5% of the compensation paid to the employee during the first 12-consecutive-months of employment and is allowed in the first tax year following the tax year in which the employee completes the 12-consecutive-month employment period.

[ Figure 3 ]

## 10 Reasons to Invest and Do Business in North Dakota

1. North Dakota was named the best run state in the nation for the 2nd year in a row. 24/7 Wall Street, 2013
2. North Dakota ranks #1 in the nation in state competitiveness. Beacon Hill Competitiveness Index, 2013
3. North Dakota ranks #1 in a national entrepreneurship index. University of Nebraska, Bureau of Business Research, 2013
4. Forbes Magazine's 2013 Best States for Business and Careers recognizes North Dakota as the #2 state for business.
5. North Dakota has a Standard & Poor's top credit ranking of 'AAA.'
6. North Dakota residents and businesses have received over \$2.4 billion in cuts to individual and corporate income and property taxes from the 2009, 2011 and 2013 legislative sessions. North Dakota Tax Commissioner
7. North Dakota was named the nation's #1 top overall growth performer since 2000. U.S. Chamber of Commerce, 2014
8. Business Facilities ranks North Dakota #1 for economic growth potential in 2013.
9. Gallup Job Creation Index ranks North Dakota #1 for the Best Jobs Market in 2013.
10. North Dakota's GDP growth outpaces all other states for the fourth consecutive year. Bureau of Economic Analysis, 2014

*Source: North Dakota Department of Commerce*

# Building the Workforce

Industry, education and government are working collaboratively across the state to inform students of IT career opportunities, provide industry-driven secondary and post-secondary IT education, and offer incentives for pursuing an IT career path. North Dakota also offers aggressive workforce training programs to meet the ever-changing skill demands of the IT industry.

## Educational Opportunities

### **IT Career Awareness Program • [www.discoverndit.com](http://www.discoverndit.com)**

ITCND, in cooperation with industry stakeholders, launched the first-ever North Dakota IT Career Awareness Program in 2007. The goal of the program is to address future IT workforce needs by informing students, parents and educators of IT career opportunities in North Dakota and encouraging students to enroll in IT-related classes and degree programs at the secondary and post-secondary education levels.

Through a partnership with the North Dakota Department of Career and Technical Education, the program has reached more than 9,500 students and 400 educators in more than 20 communities with information on IT career opportunities in North Dakota. Additional program partners are Bank of North Dakota, Basin Electric Power Cooperative, Bismarck State College, Dakota Carrier Network, Discovery Benefits, Evolution1, First International Bank & Trust, MDU Resources Group, Microsoft Fargo, Minot State University, National Information Solutions Cooperative, Sundog and Valley City State University.

### **Secondary IT Education**

Through the North Dakota Department of Career and Technical Education, high schools across the state are able to offer elective IT courses, which continue to grow in popularity and availability. These courses include introductions to information technology, computer hardware and maintenance, networking, programming, geographic information systems, web design, desktop and network operating systems, and cooperative work experience. Many of these courses align to current industry certification standards, and students enrolled in the courses take the certification exams upon completion. In 2013, IT courses were offered in 59 schools with a total enrollment of 1,593 students, a 48% increase over 2011. For more information, visit [www.nd.gov/cte](http://www.nd.gov/cte).

### **Post-Secondary IT Education**

To help fill the demand for IT professionals in the state, more than 60 IT-related certificate and degree programs are offered at North Dakota's 11 public, three private and five tribal colleges and universities. In 2012-2013, more than 300 college students graduated with IT degrees from the North Dakota University System, which includes the 11 public colleges and universities.

### **STEM Occupations Student Loan Forgiveness Program**

Recognizing the need for high-quality employees in the areas of science, technology, engineering, and mathematics (STEM), the state established the STEM Occupations Student Loan Program. The intent of the program is to reduce student loan indebtedness for individuals who have graduated in a STEM-related field and have been employed in a STEM occupation in North Dakota for one year.

Funded recipients are eligible to receive up to \$1,500 per year in continued loan forgiveness for each year they are employed in an approved STEM occupation in North Dakota, subject to a maximum of 48 months of eligible employment. Individuals must re-apply annually for new or continued funding. Qualifications and additional information are available at [www.ndus.edu](http://www.ndus.edu).

## Operation Intern

Administered by the North Dakota Department of Commerce, Operation Intern provides a valuable way for students to make connections with businesses and identify career options in North Dakota. The program is designed to expand the number of internships, work experience and apprenticeship positions provided to students attending a North Dakota high school, college or university. Employers in the state's targeted industries, including technology-based businesses, can access up to \$3,000 in matching funds for each position or up to \$30,000 per employer. During the 2013-2015 biennium, more than 100 businesses participated in Operation Intern, with 20 technology-based companies hiring a total of 118 interns. Additional information is available at [www.operationintern.com](http://www.operationintern.com).

## Workforce Training Programs

### Job Service North Dakota • [www.jobsnd.com](http://www.jobsnd.com)

**New Jobs Training** was created to assist expanding businesses in North Dakota. Due to the assumption that creating a new job has costs, the program allows a business to be reimbursed the North Dakota state income tax paid on new jobs for a 10-year period. Of the companies setting up new agreements under New Jobs Training in 2012 and 2013, 25% were IT-based. The use of the program by new and expanding IT companies remains steady.

**Workforce 20/20** assists North Dakota businesses and industries in retraining and upgrading workers' skills to meet the demands of new technologies and work methods. The funding is available to offset training costs for current and new employees being trained in a manufacturing-related skill. A funding match from the business is required. Over the 2011-2013 biennium, three IT-based training requests were approved. This accounted for 3% of the total biennium funding.

**Workforce Investment Act** provides funding for on-the-job training, youth employment and training, and adults and dislocated worker assistance. Funding is available for a maximum of three years of training. In program year 2012, the Workforce Investment Act provided 21 individuals with training opportunities in IT-related careers.

### North Dakota Department of Commerce • [www.ndcommerce.com](http://www.ndcommerce.com)

**Workforce Enhancement Grant Program** provides funding for a demand driven response to workforce training needs through development of curriculum, purchase of equipment and technology, recruitment of participants, and training and certification for instructors. The funding may not be used to supplant funding for current operations. Eligible institutions include Bismarck State College, Lake Region State College, North Dakota State College of Science, and Williston State College. More information about the program can be found at [www.workforce.nd.gov/workforce/WorkforceEnhancementGrants/](http://www.workforce.nd.gov/workforce/WorkforceEnhancementGrants/).

### North Dakota University System • [www.ndus.edu](http://www.ndus.edu)

**TrainND** offers a full range of beginning and advanced professional training on virtually any topic organizations and businesses request. In fiscal year 2013, a total of 1,489 businesses were served by the program with 16,769 employees participating in 2,180 training activities. TrainND has a loyal business base, with 46% of businesses served in 2012 coming back for additional training in 2013.

# Measuring Up

North Dakota's IT employees receive wages that are competitive with several surrounding states, including South Dakota and Montana. However, North Dakota's average median hourly wage for IT-related occupations lags behind Minnesota and the national average (Table 8). The state's wages for IT occupations are increasing at a rate similar to the nation's wages for IT occupations (Table 9).

[ Table 8 ]

## Median Hourly Wages (2013)

O*NET	Occupation	Median Hourly Wage (\$)				
		ND	SD	MT	MN	Nation
11-3021	Computer and Information Systems Managers	44.02	53.19	43.34	56.01	59.59
15-1122	Information Security Analysts	28.69	38.61	26.14	43.06	42.59
15-1131	Computer Programmers	24.98	23.37	27.44	34.80	36.60
15-1132	Software Developers, Applications	27.93	32.66	35.25	43.63	44.55
15-1133	Software Developers, Systems Software	31.83	37.94	32.83	45.93	48.75
15-1134	Web Developers	20.55	24.39	24.8	31.80	30.37
15-1141	Database Administrators	31.48	35.43	24.84	40.31	37.75
15-1142	Network and Computer Systems Administrators	30.06	27.12	27.17	35.43	35.58
15-1143	Computer Network Architects	28.26	43.99	27.60	44.12	45.85
15-1151	Computer User Support Specialists	21.45	17.06	18.62	22.75	22.41
15-1152	Computer Network Support Specialists	26.39	22.15	21.12	28.50	28.93
15-1199	Computer Occupations, All Other	31.55	35.18	30.99	34.07	39.59
<b>Total</b>		<b>\$31.56</b>	<b>\$35.23</b>	<b>\$30.94</b>	<b>\$41.56</b>	<b>\$42.63</b>

Source: U.S. Bureau of Labor Statistics



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**North Dakota Department of Career and Technical Education**



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- Essentials of Network Operating Systems
- Cisco Routing & Switching 1-4 (CCENT or CCNA)
- CIW Foundations (CIW Associate)
- CIW Site Design (CIW Professional)
- GIS (ArcView)

**Statewide Licenses**

- State ERSI K-12 License for ArcView
- Free Certipoint Certification Testing for Secondary IT Students

**Tracy Becker, Information Technology Supervisor**  
Department of Career and Technical Education  
600 E Boulevard Ave, Dept. 270  
Bismarck, ND 58505-0610

Phone: 701.328.3178 Fax: 701.328.1255  
Email: tmbecker@nd.gov Web: www.nd.gov/cte

[ Table 9 ]

## Median Hourly Wage Changes (2004 - 2013)

O*NET	Occupational Title	U.S. % Change	ND % Change
11-3021	Computer and Information Systems Managers	33.9%	34.6%
15-1131	Computer Programmers	21.0%	28.4%
15-1132	Software Developers, Applications	23.6%	15.7%
15-1133	Software Developers, Systems Software	27.2%	-4.1%
15-1141	Database Administrators	29.5%	38.2%
15-1142	Network and Computer Systems Administrators	27.2%	40.6%
15-1143	Computer Network Architects	57.3%	29.7%
15-1151	Computer User Support Specialists	15.3%	59.4%
15-1199	Computer Occupations, All Other	38.4%	54.8%
25-1021	Computer Science Teachers, Postsecondary	38.9%	22.3%

Source: Occupational Employment Statistics

## IT Occupational Shift Share

Shift share is the total change in employment over a period of time. This analysis breaks down North Dakota's total IT employment change (shift share) into three components:

- National Growth Share: Employment change attributed to national economic growth.
- Occupational Mix Share: Employment change attributed to national IT occupational trends.
- Local Share: Employment change attributed to North Dakota economic factors.

From 2002 to 2011, North Dakota experienced an increase of 440 IT jobs, with 115 attributed to national economic growth and 412 attributed to national IT occupational trends (Table 10).

[ Table 10 ]

## Shift Share (2004 - 2013)

O*NET	Occupation	National Growth Share	Occupational Mix Share	Local Share	Shift Share
11-3021	Computer and Information Systems Managers	18	81	-119	-20
15-1131	Computer Programmers	23	-183	-180	-340
15-1132	Software Developers, Applications	16	224	309	550
15-1133	Software Developers, Systems Software	16	64	120	200
15-1141	Database Administrators	6	26	-71	-40
15-1142	Network and Computer Systems Administrators	15	152	-77	90
15-1143	Computer Network Architects	9	-52	-67	-110
15-1199	Computer Occupations, All Other	8	108	34	150
25-1021	Computer Science Teachers, Postsecondary	4	-8	-36	-40
	<b>Total Change in Employment</b>	<b>115</b>	<b>412</b>	<b>-87</b>	<b>440</b>

Source: Job Service North Dakota

**Location Quotient**

Location quotient (LQ) compares an area’s business composition to that of a larger area (Table 11). For the purpose of this document, the IT occupations at the state and national level are compared. If an LQ is greater than one (1), it indicates the state has proportionally more workers than the nation employed in that occupation. This indicates an opportunity for the state to attract additional IT professionals to meet workforce demand.

[ Table 11 ]

IT Occupation LQ (2004 - 2013)

O*NET	Occupation	LQ 2004	LQ 2013
11-3021	Computer and Information Systems Managers	0.77	0.48
15-1121	Computer Systems Analysts	0.44	0.00
15-1131	Computer Programmers	0.64	0.32
15-1132	Software Developers, Applications	0.44	0.50
15-1133	Software Developers, Systems Software	0.58	0.55
15-1141	Database Administrators	0.71	0.35
15-1142	Network and Computer Systems Administrators	0.65	0.44
15-1143	Computer Network Architects	0.62	0.33
15-1151	Computer User Support Specialists	0.86	0.83
15-1199	Computer Occupations, All Other	0.71	0.61
25-1021	Computer Science Teachers, Postsecondary	1.19	0.61
	<b>Total</b>	<b>0.69</b>	<b>0.46</b>

Source: Occupation Employment Statistics

ITCND IT Award Winners  
2013 - 2014

**Premier IT Business**

2013 – Sundog, Fargo

2014 – AgriData, Inc, Grand Forks

**Technology Innovator**

2013 – Eid Passport, Inc., Minot

2014 – Stutsman County, Jamestown

**North Dakota IT Champion**

2013 – Randall Thursby, North Dakota University System, Fargo

2014 – North Dakota Highway Patrol, Bismarck



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# Emerging IT Trends

The diversity of the IT industry means it impacts virtually every business – from the service industry and trucking companies to manufacturing specialists and health care professionals and from large companies to small sole proprietor businesses. New technologies and applications, as well as North Dakota’s booming economy, have the potential to create opportunities, along with challenges, for North Dakota’s IT industry.

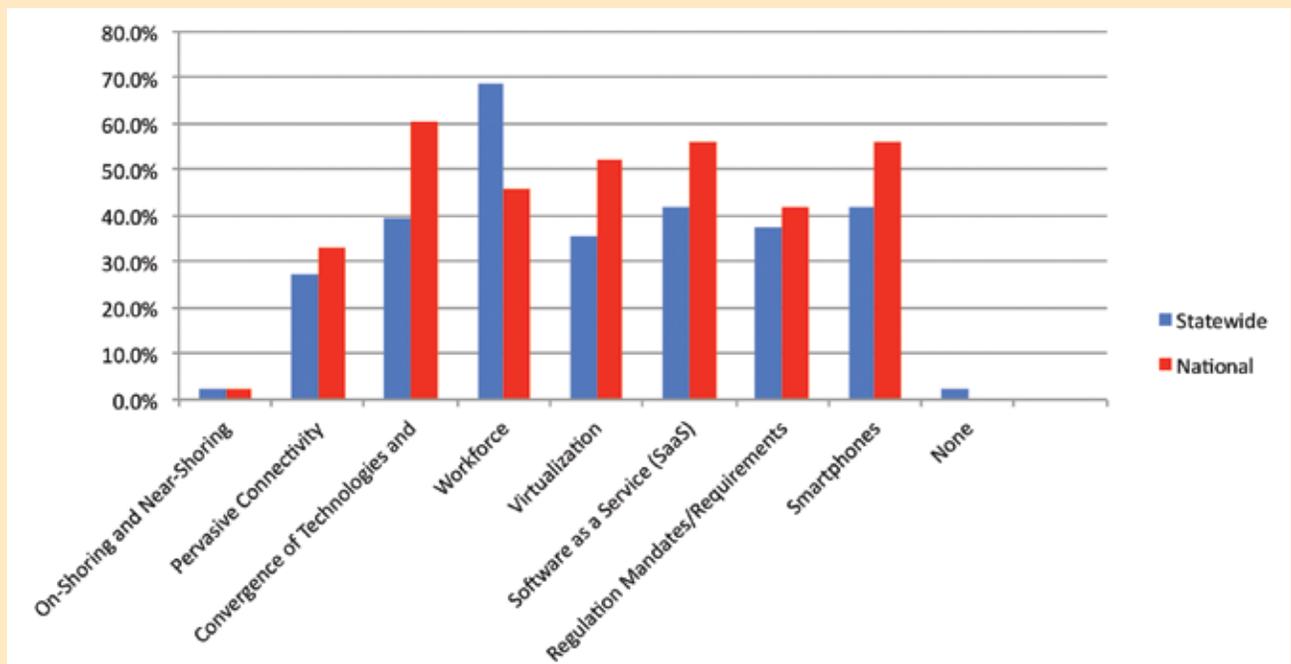
## Workforce is Top Trend

In a survey conducted by ITCND, North Dakota IT leaders within in the state identified workforce as the top state trend impacting their business or organization. Nearly 60% of respondents indicated workforce needs are not being met. The primary causes indicated are shortage of available general workforce and lack of skills in available workforce.

Survey respondents also identified convergence of technologies and services, smart phones and software as a service as the three state and national trends impacting or having the most potential to impact their business (Figure 4).

[ Figure 4 ]

## State and National IT Trends (2014)



Source: 2014 ITCND Survey

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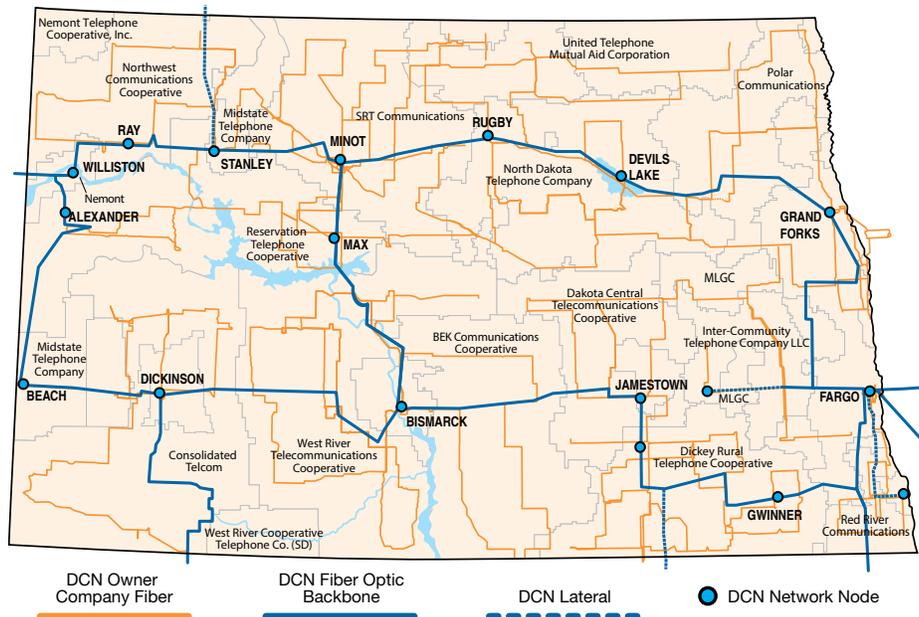
## Delivering Confidence

DCN is owned by 15 independent rural telecommunications companies. Together with DCN, these owner companies have made significant investments in fiber infrastructure over the last three years.

- DCN and its owner companies have over 40,000 miles of fiber optic facilities deployed across the state.
- DCN and its owner companies employ more than 1,000 people that live and work in local communities.
- The owner companies have a collective total plant investment worth more than \$1.3 billion, and they have invested more than \$100 million per year in fiber construction and electronics for each of the last three years.

These owner companies represent all the major local independent telephone companies and serve more than 164,000 customers in 250 communities — more than 85 percent of all the exchanges in the state. Recent facility improvements have enabled DCN to accommodate an expanding network and growing customer needs — and provide even greater assurance of business survivability.

*"We are proud to be aligned with such forward-thinking companies that are dedicated in providing quality services throughout the state," said Seth Armdorfer, CEO. "Our partnerships create new opportunities for businesses seeking rapid access to cutting-edge fiber optic technologies."*



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