The State of the North Dakota Workforce: 2007

submitted to the North Dakota Department of Commerce
Workforce Development Division
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By

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Introduction

There has been plenty of good news lately for North Dakota's economy and employment. In general, North Dakota's economic mix and natural resources have positioned the state well to reap the benefit of global economic trends. The world's ever-growing demand for energy means that the energy resources with which North Dakota is rich – including oil, natural gas, and other less traditional sources of energy generation – will draw money and jobs to the state in the coming years.

Meanwhile, that same demand for energy, combined with increasing worldwide food demand, has recently had a powerful effect on the prices of agricultural products grown in North Dakota. Farmers are already beginning to see healthier profits on their goods as the world experiments with forms of energy from plant matter, and the development of new trends in value added agriculture promises new economic opportunity for North Dakota's strong agriculture sector.

The North Dakota Department of Commerce is reporting more good news, with figures for North Dakota's economy that indicate:

- **New jobs** – The Department of Commerce reports 25,100 net new jobs in North Dakota since 2000, including 4,400 in health care, 4,650 in business services, and 2,150 in manufacturing.
- **Healthier income** – Since 2000, North Dakota's per capita income has risen 30%.
- **New business creation** – 2,062 new businesses have been created in the state since 2000.
- **Population stabilization** – Year-to-year population change estimates showed an increase in state population of 1,200 people between 2005 and 2006.
- **A favorable reputation** – Among other plaudits received by the state and some of its communities, North Dakota has the distinction of having two metropolitan areas – Bismarck and Fargo – listed among the top 5 the *Forbes* magazine list of the best smaller metros for business and careers.[1]

The Most Important Resource – Human

The purpose of this report is to evaluate the supply and condition of North Dakota's most valuable resource – its workforce. North Dakota's legislature has recently approved the Department of Commerce to embark upon its Talent Initiative. The Talent Initiative is an effort designed specifically to expand, attract, and retain talent within North Dakota, in order to secure the best possible workforce to support the state's continuing growth in the 21st century global economy.

This document, then, is designed as an "intelligence report" to support the strategic actions of the Talent Initiative. Just as a military operation relies on detailed and useful intelligence to inform decisions that will lead to victory, so a workforce agency must know the most valuable

[1] From presentation given by ND DOC's Jim Hirsch to the Economic Development Association of North Dakota, June 19, 2007.

information about the quantity and quality of workers in its area to be able to take action and support effective policy decisions.

Knowing the state of the workforce will help the Department of Commerce take best advantage of the talent that already exists in the state, and find the quantitative and qualitative "gaps" that might hinder progress for the state's key 21st century industries. North Dakota wants to ensure that the good news for the state's economy continues, and the best way to make such good news is with an ample supply of highly qualified workers. This report aims to provide a basis for understanding that supply and its relationship to what the North Dakota economy will demand.

Economic Background

North Dakota's Gross Domestic Product

According to the US Bureau of Economic Analysis (BEA), North Dakota's real[2] GDP had a value of $21,903,000,000 in 2006. This represents a 3.1% increase over 2005's real GDP. By contrast, the GDP of the United States as a whole increased by 3.4% over the same period. Among the states, one-year GDP growth rates ranged from 7.4% (in Idaho) to -0.5% (Michigan). This puts North Dakota in the middle of the pack of the US, specifically, 24th out of the 50 states.

Taking a longer historical view, we find that the middle of the pack is a position that North Dakota has occupied economically for some time.

North Dakota GDP Growth and Rank

Time	Real GDP Growth	Rank in US States
1990-1997	22%	29
1997-2006	29%	24

Source: BEA

North Dakota's 29% overall real GDP growth in the last decade improved its ranking among the states slightly over its position in the 1990s[3], placing it just within the top half of the country.

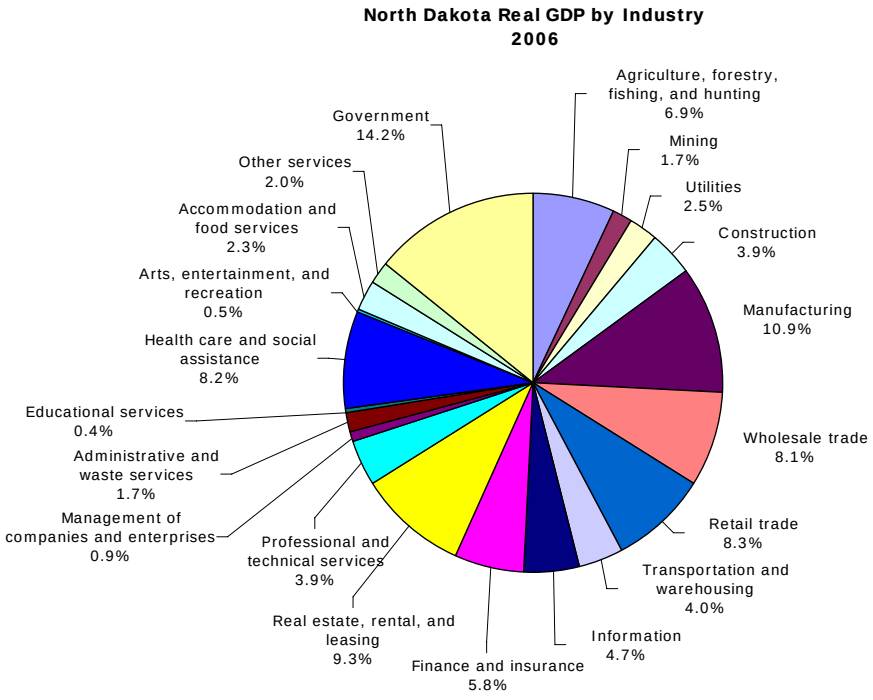
Industries influencing GDP

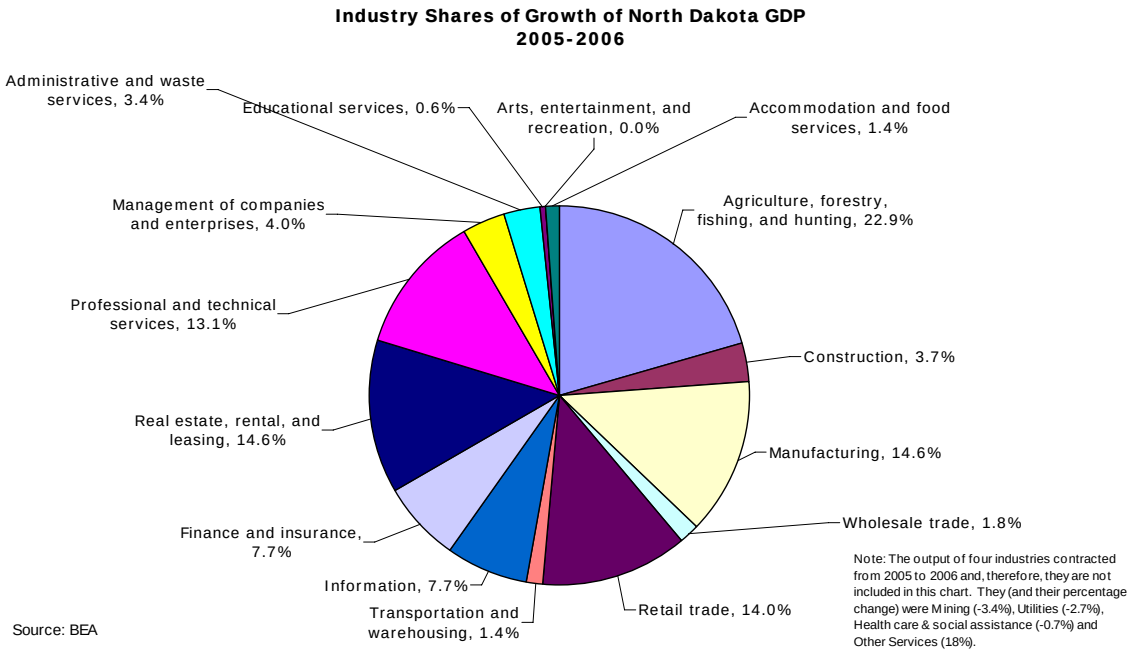
Looking deeper at the gross product of the state, we can start to form a picture of the North Dakota economy and the industries that drive it. Breaking down the state's GDP by industry, we see the proportional influence of each industrial sector on the North Dakota economy's total output in 2006. The pie chart below demonstrates these relevant influences.

Interestingly, it is spending by the Government sector that accounted for the largest part (14.2%) of North Dakota's GDP in 2006. This may partially be explained by the extent to which spending

[2] "Real" indicates that figures have been adjusted for inflation. All dollar values are in 2000$.
[3] The break here at 1997 is necessitated by the change that year in the industry classification system used in the US, from Standard Industrial Codes (SIC) to the North American Industrial Classification System (NAICS).

on public schools and government-provided health services is encompassed by the "government" sector. Military expenditures are included here as well. At this level of industry aggregation – necessitated by the available data – it is difficult to say how much of the government's expenditures ought to be broken out into those components. The largest private component of the state's production is Manufacturing, at 10.9% of GDP. Real Estate, Rental and Leasing follows with a GDP share of 9.3%. By itself, the Health Care sector accounts for a significant 8.2% of GDP, placing it on par with retail and wholesale trade (8.3% and 8.1%, respectively) in terms of market influence.





Taken together, however, the Wholesale Trade and Transportation and Warehousing sectors – which combined form the core of what is commonly referred to as "Logistics" – account for 12.1% of the state's output in 2006, higher than any other single private industry sector.

Looking in turn at the influence of various industries on North Dakota's GDP *growth* from 2005-2006, we see a slightly different picture. The largest component of the annual change was by far the Agriculture, Forestry, Fishing, and Hunting sector, at 22.9% of the total. North Dakota's economy is still tied strongly to the value of its agricultural output. Examining year-to-year real GDP growth in North Dakota, this trend becomes clear. During the last decade, years of strong GDP growth in North Dakota have been accompanied by large gains in agricultural output – which has accounted for as much as 60% of total growth in past years – while years of weak growth or even decline have seen corresponding declines in Agriculture. Over the period 1998 to 2006, changes in total state GDP and changes in its agricultural component were highly (86.2%) correlated.

Agriculture's Links to North Dakota GDP

	1998	1999	2000	2001	2002	2003	2004	2005
Total change in Real GDP (000's of chained 2000 dollars)	495	-283	508	155	911	1034	78	1322
Percent change of Total Real GDP	2.9%	-1.6%	2.9%	0.9%	5.1%	5.5%	0.4%	6.6%
Change in Agricultural component of Real GDP	297.86	-326	200	-132	310	353	-439	312
Percent change of Agricultural component	36.8%	-29.5%	25.7%	-13.5%	36.6%	30.5%	-29.1%	29.1%
Agriculture's change as a % of Total Real GDP change	60.2%	115.2%	39.4%	-85.2%	34.0%	34.1%	-562.8%	23.6%

Source: BEA

Individual Industry Output Growth

Looking at the output of individual industries independently, rather than in percentage terms, we find a source of some good news about North Dakota's economic health in the following table.

Index of North Dakota's Real GDP Growth, by Major Industrial Sector, 1997 to 2006 (1997=100)										
Industry	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
All Industries	100	102.9	101.2	104.2	105.1	110.5	116.6	117.0	124.8	128.6
Agriculture, forestry, etc.	100	136.8	96.4	121.2	104.8	143.2	186.9	132.5	171.2	**189.6**
Mining	100	90.4	94.2	93.0	86.5	74.5	76.2	84.6	93.0	89.9
Utilities	100	106.7	109.2	99.8	98.5	107.9	110.4	111.3	116.5	113.3
Construction	100	103.4	111.6	97.7	91.0	87.1	88.8	95.1	96.2	99.0
Manufacturing	100	89.9	91.4	90.0	95.3	105.4	113.7	115.8	136.2	**141.8**
Durable goods	100	88.4	90.5	88.4	95.8	109.4	117.5	117.4	153.5	**161.5**
Nondurable goods	100	91.5	91.9	92.1	93.0	96.1	104.4	110.7	102.6	104.1
Wholesale trade	100	107.4	109.6	110.0	118.6	122.2	134.4	139.4	142.0	**142.9**
Retail trade	100	102.2	104.1	106.6	112.7	114.8	121.1	123.2	130.2	**137.0**
Transportation and warehousing	100	97.7	98.4	111.2	101.7	94.0	102.1	106.6	112.7	113.9
Information	100	109.2	120.7	124.2	135.6	150.0	165.7	195.0	214.2	**225.1**
Finance and insurance	100	114.4	122.1	137.1	136.5	147.1	147.6	150.5	147.4	**153.4**
Real estate, rental, and leasing	100	101.6	104.4	106.4	112.5	125.0	121.5	126.9	136.1	**142.7**
Professional and technical services	100	102.7	103.6	94.6	101.6	103.9	100.5	109.6	121.9	**135.3**
Management of companies	100	97.3	92.9	101.6	86.8	90.1	93.4	97.8	99.5	113.7
Administrative and waste services	100	101.7	106.2	103.1	106.9	108.6	109.6	111.0	121.6	**129.2**
Educational services	100	94.7	101.3	102.7	97.3	100.0	100.0	104.0	106.7	112.0
Health care and social assistance	100	99.2	100.5	102.5	103.9	105.4	109.4	113.4	117.3	116.5
Arts, entertainment, and recreation	100	90.6	91.5	86.8	90.6	98.1	99.1	94.3	95.3	95.3
Accommodation and food services	100	102.0	101.0	100.6	95.8	94.0	97.0	98.8	100.8	102.6
Other services, except government	100	96.2	93.9	91.5	89.1	88.9	93.7	90.5	90.5	88.9
Government	100	98.8	89.9	97.6	99.0	102.0	106.1	105.2	107.5	109.0
Source: BEA										

Comparing the value of each industry sector's output to the level of that output in 1997, we see that most are growing along with the state's overall GDP. Those industries that have exhibited substantial growth – i.e. over 20% increase in the last decade – are marked in blue.

- Chief among these is the Information sector, which has nearly doubled its output since 1997 in North Dakota. Along with this, we might add growth in the Professional and Technical Services sector, which contains technical industries and occupations that align closely with the Information sector. This presents strong justification for its selection as a key industry for targeted economic development. It also presents a challenge for providing a significant number of highly skilled, highly educated individuals whose presence is crucial for growth. Later in this report we will address both of these implications.

- Agriculture's 2006 output approaches double its level from 1997. Year to year observations of Agriculture output reveal ups and downs, as befits the volatile nature of the business. Still, the overall trend is unmistakably one of growth, which is important to a state whose economy is – as observed above – still strongly linked with the success of Agriculture.

- After an initial dip in the late 1990s and first year of the new century, growth in the Manufacturing sector's output – driven primarily by durable goods manufacturing, at that – has risen quickly and strongly in the last five years, contributing to overall growth of 41.8% in the sector as a whole and 61.5% in durable goods alone. To the extent that the

state's economic hopes are tied to this sector – the focus of another of the state's target industry groups – this is an encouraging sign.

- Strong growth in the Finance and Insurance and Real Estate sectors should not go unnoticed, and indeed, merits further attention. Later, we will see that significant portions of these industry sectors have been included with the Information Technology industry sector, a target for North Dakota's economic and workforce development efforts.

- Wholesale and Retail Trade exhibit strong growth, and combined with a solid trend of growth in the Transportation sector since 2003, this indicates good and improving health in the "logistics" area.

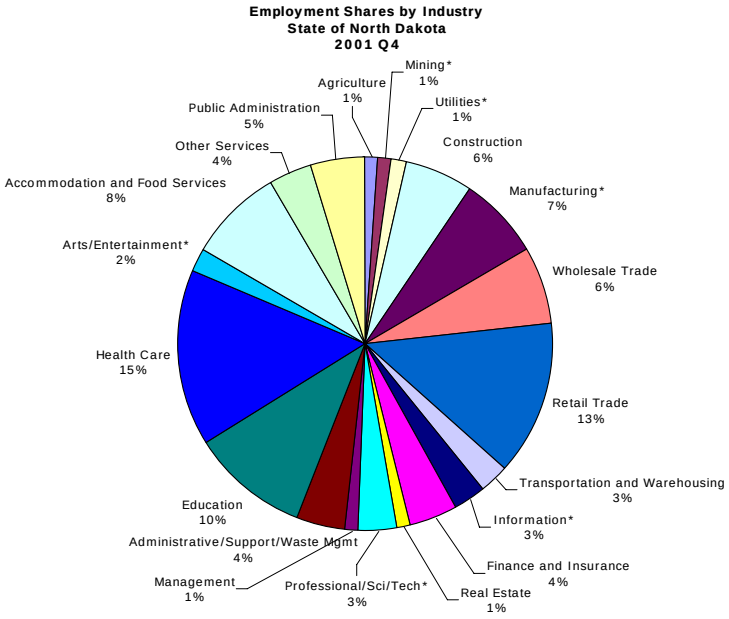
Industry influence by regional employment

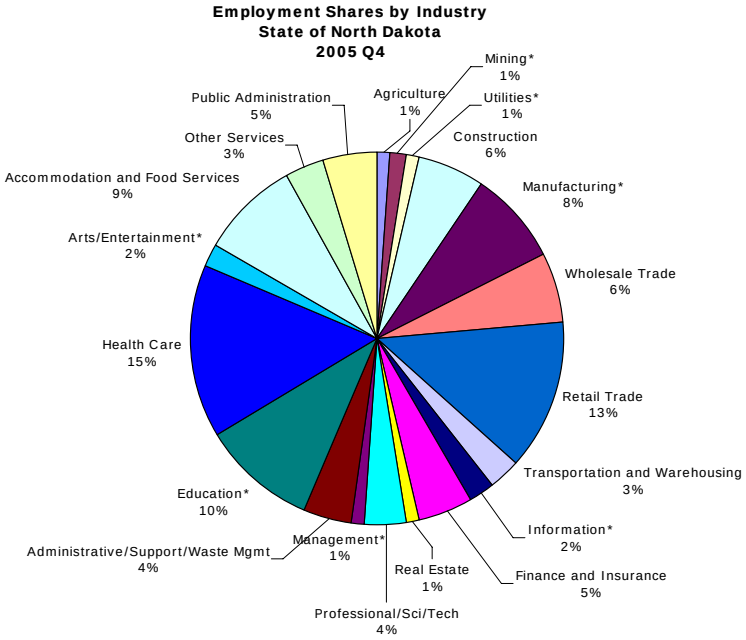
What can we say more specifically about North Dakota's balance of industries with relation to the workforce? State data give us the ability to examine the relative size of industries in the state itself, and its eight workforce regions, by the number of people employed in each industry sector.

Using employment data taken from the U.S. Census Bureau's Local Employment Dynamics, in which states' employment statistics are listed quarterly, we can see a snapshot of North Dakota's industry employment during the first portion of the 21st century. Judging by the comparison between 2001's industry employment shares and those listed in 2005, North Dakota's overall employment profile has changed little with respect to the industries in which most of its workers are found.[4]

Indeed, the two charts below are nearly identical in terms of the percentages of the North Dakota workforce accounted for by each industry sector in each year. Health Care employs nearly 15% of the non-farm workers in North Dakota. This most vital of personal services is always labor intensive, and fortunately for North Dakota's health care workers, offers lucrative "career ladders" for many fields that fall under its sector. The same cannot be said, in large part, for careers in the Retail Trade sector, but it is another labor intensive industry and accounts for the next highest percentage of employment.

[4] It must be noted here that these official statistics take into account only those occupations that are covered by unemployment insurance, which does not include most agricultural workers. Therefore, changes in the employment of this part of North Dakota's workforce are more difficult to observe statistically.


Employment Shares by Industry
State of North Dakota
2001 Q4
Mining* 1%
Agriculture 1%
Utilities* 1%
Public Administration 5%
Construction 6%
Other Services 4%
Manufacturing* 7%
Accommodation and Food Services 8%
Wholesale Trade 6%
Arts/Entertainment* 2%
Health Care 15%
Retail Trade 13%
Transportation and Warehousing 3%
Education 10%
Information* 3%
Administrative/Support/Waste Mgmt 4%
Finance and Insurance 4%
Management 1%
Professional/Sci/Tech* 3%
Real Estate 1%


Employment Shares by Industry
State of North Dakota
2005 Q4
Mining* 1%
Public Administration 5%
Agriculture 1%
Utilities* 1%
Other Services 3%
Construction 6%
Accommodation and Food Services 9%
Manufacturing* 8%
Arts/Entertainment* 2%
Wholesale Trade 6%
Health Care 15%
Retail Trade 13%
Transportation and Warehousing 3%
Education* 10%
Information* 2%
Management* 1%
Administrative/Support/Waste Mgmt 4%
Real Estate 1%
Finance and Insurance 5%
Professional/Sci/Tech 4%

Regional breakdown of influential industries by employment

To a certain extent, we can also look at the same arrangement of employment into industry sectors in each of the state's eight workforce regions. The following pages present this arrangement in tabular form – both the percentage of each region's economy accounted for by the various industry sectors, and the percentage of activity in each industry that takes place in the various planning regions.

Key observations from these tables include the following:

- Employment in the Mining and Extraction sector – which includes oil, gas, and coal, among other industries – is heavily concentrated in the western portion of the state, especially in the Williston workforce area in the northwest (where it accounts for 13.7% of total regional employment and 38.4% of the state's total employment in Mining).

- Health care and Education together account for about 25%-30% of non-farm employment in every region, and in the state as a whole.

- Retail Trade is also fairly universally influential as an employer, accounting for 12-15% of employment in every region.

- The combination of Wholesale Trade and Transportation and Warehousing amounts to a combined 7-10% of employment in nearly every region, seeing its highest concentration in the Fargo region at a combined 11%. Interestingly, in the Bismarck region, these two industries together only account for 6.2% of the total non-farm workforce.

- Manufacturing is a larger employer in regions that contain North Dakota's larger metro areas, including all three of its MSAs – Grand Forks, Fargo, and Bismarck – and two other workforce regions, Dickinson and Jamestown. (Manufacturing's share of the Jamestown region's employment stood at 12.2% in the fourth quarter of 2005.)

- The workforce regions that include the state's major metropolitan areas take up the lion's share of activity in the Management, Professional/Scientific/Technical Services, and Admin/Support Services categories. Several other kinds of service industries are also highly concentrated in these areas. As these are the areas of the state where the most population is concentrated, as well as the greatest numbers of businesses, it is not surprising that these industry sectors are proportionally well-represented there.

Industry Employment in North Dakota's Workforce Regions

	State	1 - Williston	2 - Minot	3 - Devils Lake	4 - Grand Forks	5 - Fargo	6 - Jamestown	7 - Bismarck	8 - Dickinson
Agriculture	1.1%	0.5%	0.4%	1.0%	3.5%	0.7%	1.4%	0.5%	0.6%
Mining	1.4%	13.7%	1.9%	N/A	0.4%	0.1%	0.1%	1.6%	4.2%
Utilities	1.1%	0.9%	0.7%	0.7%	0.6%	0.3%	0.7%	3.6%	0.6%
Construction	6.0%	3.9%	6.1%	4.5%	5.6%	6.4%	3.9%	7.2%	5.4%
Manufacturing	7.9%	3.0%	3.8%	5.8%	8.3%	10.4%	12.2%	5.5%	8.2%
Wholesale Trade	6.1%	7.1%	6.5%	4.8%	4.5%	7.9%	6.6%	4.1%	6.2%
Retail Trade	13.2%	12.6%	14.1%	12.3%	15.0%	13.3%	11.9%	12.0%	13.1%
Transportation and Warehousing	2.7%	2.3%	2.4%	1.7%	3.0%	3.1%	2.4%	2.1%	2.8%
Information	2.3%	1.6%	2.2%	3.5%	1.4%	2.7%	2.0%	2.4%	1.9%
Finance and Insurance	4.8%	3.4%	5.6%	4.1%	2.6%	6.1%	3.9%	4.8%	4.0%
Real Estate	1.2%	1.8%	1.0%	1.4%	0.8%	1.6%	0.7%	0.9%	0.7%
Professional/Sci/Tech	3.5%	3.0%	4.3%	1.0%	2.5%	4.4%	2.7%	3.5%	2.7%
Management	1.0%	0.0%	0.1%	0.6%	0.3%	1.9%	N/A	1.4%	0.3%
Administrative/Support/Waste Mgmt	4.2%	2.8%	5.3%	2.0%	4.8%	5.2%	1.9%	3.2%	2.6%
Education	10.1%	11.0%	9.9%	16.1%	14.4%	7.5%	10.8%	9.7%	9.7%
Health Care	14.9%	14.3%	16.1%	14.7%	15.6%	11.9%	20.2%	16.0%	17.9%
Arts/Entertainment	2.1%	1.0%	2.2%	6.5%	1.4%	2.0%	1.4%	2.0%	2.7%
Accommodation and Food Services	8.5%	9.8%	9.0%	6.7%	9.3%	8.8%	8.1%	7.7%	7.8%
Other Services	3.4%	3.0%	3.3%	1.9%	3.1%	3.5%	3.6%	3.8%	3.7%
Public Administration	4.7%	4.4%	5.1%	10.8%	2.9%	2.3%	5.5%	7.9%	5.1%

Source: Job Service North Dakota QWI, Q4 2005

Share of Industry Employment in Each of North Dakota's Workforce Regions

	State	1 - Williston	2 - Minot	3 - Devils Lake	4 - Grand Forks	5 - Fargo	6 - Jamestown	7 - Bismarck	8 - Dickinson
Agriculture	100.0%	1.8%	4.0%	3.8%	46.4%	22.3%	9.9%	9.0%	2.9%
Mining	100.0%	38.4%	16.3%	N.A.	4.1%	1.4%	0.5%	23.8%	15.6%
Utilities	100.0%	3.1%	6.7%	2.7%	7.6%	7.4%	4.4%	65.4%	2.6%
Construction	100.0%	2.5%	11.6%	3.2%	13.8%	34.9%	4.9%	24.5%	4.6%
Manufacturing	100.0%	1.5%	5.6%	3.1%	15.4%	43.3%	11.6%	14.4%	5.2%
Wholesale Trade	100.0%	4.4%	12.1%	3.4%	10.8%	42.3%	8.1%	13.7%	5.1%
Retail Trade	100.0%	3.7%	12.3%	3.9%	16.6%	33.1%	6.8%	18.6%	5.0%
Transportation and Warehousing	100.0%	3.3%	10.4%	2.7%	16.7%	38.2%	6.9%	16.3%	5.4%
Information	100.0%	2.7%	11.0%	6.5%	9.0%	38.4%	6.5%	21.7%	4.3%
Finance and Insurance	100.0%	2.7%	13.4%	3.6%	7.9%	41.5%	6.1%	20.6%	4.2%
Real Estate	100.0%	5.8%	10.2%	5.2%	9.8%	45.5%	4.4%	16.1%	2.9%
Professional/Sci/Tech	100.0%	3.2%	14.1%	1.2%	10.4%	41.1%	5.8%	20.4%	3.8%
Management	100.0%	0.0%	0.6%	2.4%	3.8%	62.3%	N.A.	29.4%	1.5%
Administrative/Support/Waste Mgmt	100.0%	2.6%	14.5%	2.1%	16.9%	41.3%	3.5%	15.9%	3.1%
Education	100.0%	4.2%	11.3%	6.7%	20.9%	24.2%	8.1%	19.8%	4.9%
Health Care	100.0%	3.7%	12.4%	4.2%	15.3%	26.2%	10.2%	22.0%	6.1%
Arts/Entertainment	100.0%	1.9%	12.1%	13.2%	10.0%	31.1%	5.1%	20.1%	6.5%
Accommodation and Food Services	100.0%	4.4%	12.1%	3.3%	15.9%	33.8%	7.2%	18.6%	4.6%
Other Services	100.0%	3.4%	11.0%	2.3%	13.1%	33.9%	8.0%	22.7%	5.5%
Public Administration	100.0%	3.6%	12.5%	9.8%	9.0%	16.1%	8.9%	34.7%	5.5%

Source: Job Service North Dakota QWI, Q4 2005

North Dakota's target industries and economic development

In its efforts to create economic growth, expansion, and diversification for the North Dakota economy in the 21st century, the state has identified a set of key industry sectors upon which to focus economic and workforce development activities. Following are brief introductions of these sectors and their component industries.

Information Technology-Based Companies

Tracking GDP growth across industry sectors in North Dakota revealed a twofold increase in output in the Information sector alone, and healthy growth in the complementary Professional and Technical Services sector. This is a positive sign for North Dakota's hopes to continue moving strongly into the high-tech 21st century economy. The state's official listing of industries that belong to the IT sector includes the following:

Component Industries for Information Technology Sector	
31-33	Manufacturing*
42	Wholesale Trade*
44-45	Retail Trade*
4541	Electronic Shopping and Mail-Order Houses
511	Publishing Industries (Except Internet)
512	Motion Picture & Sound Recording Industries
515	Broadcasting (Except Internet)
516	Internet Publishing & Broadcasting
517	Telecommunications
518	Internet Services Providers, Web Search Portals, & Data Processing Services
519	Other Information Services
522320	Financial Transactions Processing, Reserve, and Clearinghouse Activities
523920	Portfolio Management
5241	Insurance Carriers
524291	Claims Adjusting
524292	Third Party Administration of Insurance and Pension Funds
525	Funds, Trusts, and Other Financial Vehicles
541219	Other Accounting Services
5415	Computer Systems Design & Related Services
5417	Scientific Research & Development Services
541990	All Other Professional, Scientific, and Technical Services
55	Management of Companies and Enterprises
5611	Office Administrative Services
561410	Document Preparation Services
561422	Telemarketing Bureaus

*Higher-end technology is captured under these industries' core functions.
Source; Job Service North Dakota. Derived from ETA O*Net Online High Growth Industry Profile

As this list demonstrates, the IT sector in North Dakota is crucial to the success of many of the industries that drive the state's economy. In turn, the success of the IT sector will depend on North Dakota's ability to train, recruit, and retain individuals with exceptional technical skills and education, especially in computer and mathematical fields. We will examine the workforce development challenge that this presents for North Dakota in greater detail later in this report.

Advanced Manufacturing

Generally accepted definitions of Advanced Manufacturing describe industries that combine high technology and a highly skilled and flexible workforce to maximize productivity. According to the National Council for Advanced Manufacturing (NACFAM),

> Advanced manufacturers make extensive use of computer, high precision, and information technologies integrated with a high performance workforce in a production system capable of furnishing . . . products in small or large volumes, with both the efficiency of mass production and the flexibility of custom manufacturing in order to respond rapidly to customer demands.[5]

North Dakota's official designation of the industries that belong in Advanced Manufacturing includes all of the following:

Component Industries for Advanced Manufacturing Sector	
311	Food Manufacturing
312	Beverage & Tobacco Product Manufacturing
313	Textile Mills
314	Textile Product Mills
315	Apparel Manufacturing
316	Leather & Allied Product Manufacturing
321	Wood Product Manufacturing
322	Paper Manufacturing
323	Printing & Related Support Activities
324	Petroleum & Coal Products Manufacturing
325	Chemical Manufacturing
326	Plastics & Rubber Products Manufacturing
327	Nonmetallic Mineral Product Manufacturing
331	Primary Metal Manufacturing
332	Fabricated Metal Product Manufacturing
333	Machinery Manufacturing
334	Computer & Electronic Product Manufacturing
335	Electrical Equipment, Appliance, and Component Manufacturing
336	Transportation Equipment Manufacturing
337	Furniture & Related Product Manufacturing
339	Miscellaneous Manufacturing

Source: Job Service North Dakota. Derived from *Advanced Manufacturing Industry: Addressing the Workforce Challenges of America's Advanced Manufacturing Workforce.* An ETA/Business Relations Group Report.

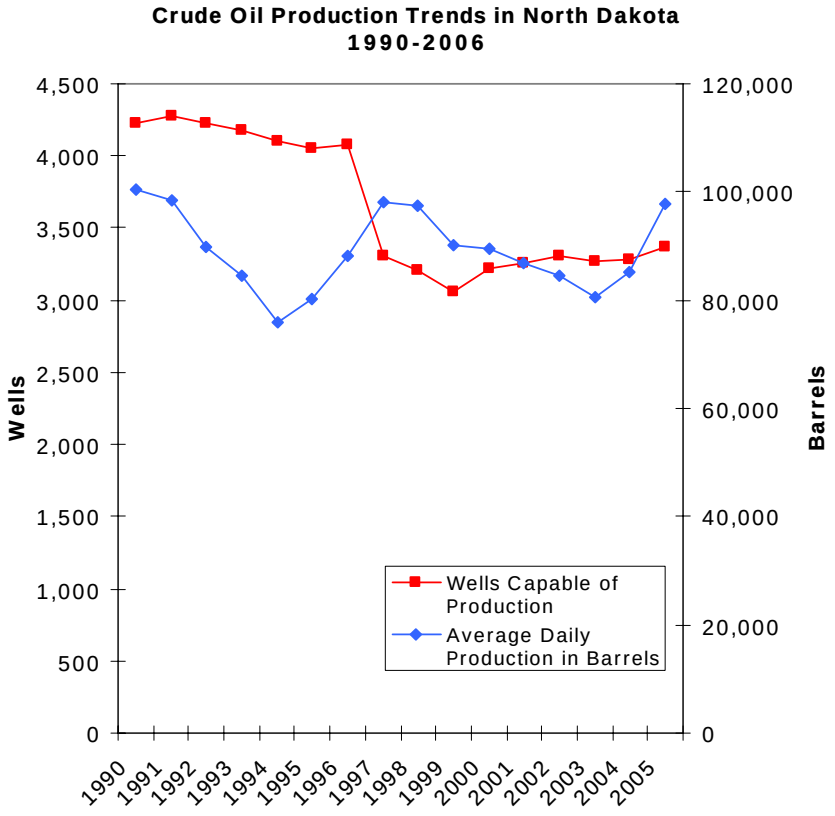
[5] See http://www.nacfam.org/faq.html#advanced

This list includes several industries that are not usually regarded as part of the family of "advanced manufacturing" – industries that typically rely on traditional technologies, processes, and workforce needs. Some, like textiles and apparel manufacturing, are subject to extensive overseas outsourcing as companies take advantage of cheaper labor in other countries for this necessarily labor-intensive industry. Others, like food and beverage production, typically offer less competitive wages than advanced manufacturers, and are increasingly relying on cheaper immigrant labor nationwide to fill their workforce needs.

Advanced manufacturing processes are indeed taking hold in several listed industries in this sector; including, for example, chemical manufacturing, computer and electronic manufacturing, and transportation equipment manufacturing. These industries have, and will have, much different workforce needs than those at the lower end of the productivity and technology scales. For purposes of workforce development, it may be productive to divide and/or refine this list to include a set of industries that are all moving toward truly advanced manufacturing, set apart from the general realm of manufacturing.

Energy

North Dakota's richness in energy-producing natural resources, particularly in the western portion of the state, has drawn a significant presence of the energy industry, and continues to do so. Recent signs point to an increase in activity and output in this sector. The following graph shows a resurgence in production and the number of active crude oil wells in North Dakota in recent years, with an upward trend in both numbers.



These signs of life are corroborated by results of a recent needs analysis that suggests an annual need for 2,700 to 3,200 workers in just the western portion of North Dakota to support the industry's activities between now and 2010.

Officially, the industries within North Dakota's targeted sector for Energy include the following:

Component Industries for Energy Industry Sector	
21	MINING
211	Oil & Gas Extraction
212	Mining (Except Oil & Gas)
213	Support Activity for Mining
221	Utilities (Except 2213: Water, Sewage & Other Systems: But, Includes Wind Power)
324	Petroleum & Coal Products Manufacturing *
325193	Ethyl Alcohol Manufacturing*
325199	All Other Basic Organic Chemical Manufacturing (Biodiesel)*
486	Pipeline Transportation

*Also listed in Advanced Manufacturing.
**Also listed in Advanced Manufacturing and Value added Agriculture
Source; Job Service North Dakota. Derived from ETA O*Net Online High Growth Industry Profile

Note that this list includes several industries that are cross-listed in North Dakota's Advanced Manufacturing sector and Value Added Agriculture, reflecting increased activity in industries serving growing demand for alternative forms of energy.

Value Added Agriculture

The North Dakota Department of Commerce defines "Value Added Agriculture" as follows:

> . . . changes made to primary agriculture products (crops and livestock) that increase the product's value, thereby creating new economic activity and jobs in one of three ways:
>
> - Process activities that create value for the product and/or introduce the product to new markets;
> - Diversification and/or modification of primary agriculture products; or
> - Pre-production modifications that increase yields, quality, and uses.[6]

The officially listed industries that form the Value Added Agriculture sector include all or part of the industries in the following list.

[6] See http://www.growingnd.com/index.asp?section=detail&pageid=402

Component Industries for Value Added Agriculture Sector	
112	Animal Production
115114	Postharvest Crop Activities (Except Cotton Ginning)
311	Food Manufacturing *
316	Leather and Allied Product Manufacturing*
325193	Ethyl Alcohol Manufacturing*
325199	All Other Basic Organic Chemical Manufacturing (Biodiesel)*
4245	Farm Product Raw Material Merchant Wholesalers

*Also listed in Advanced Manufacturing

Source: Job Service North Dakota. Derived from USDA value added definition.

Informal tracking by Job Service North Dakota indicates significant entrepreneurial activity in this area in the state. Data on this sector's workforce are not as readily available as some other sectors, since many agricultural occupations do not necessarily fall under the strict jurisdiction of the state workforce system (i.e. covered by the unemployment system). Still, it is an important part of the North Dakota economy, and where information related to this sector presents itself, it will be addressed accordingly in this report.

Tourism

The Tourism sector in North Dakota officially involves each of the following industries.

Component Industries for Tourism Sector	
114210	Hunting and Trapping (Commercial Game Preserves)
312130	Wineries*
453220	Gift, Novelty, and Souvenir Stores
481111	Scheduled Passenger Air Transportation
481211	Nonscheduled Chartered Passenger Air Transportation
485 less 4854	Transit and Ground Passenger Transportation excluding School and Employee Bus Transportation
487	Scenic and Sightseeing Transportation
532111	Passenger Car Rental
532120	Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing
532292	Recreational Goods Rental
541930	Translation and Interpretation Services
5615	Travel Arrangement and Reservation Services (Including Convention and Visitors Bureaus)
561920	Convention and Trade Show Organizers
71	ARTS, ENTERTAINMENT, AND RECREATION
711	Performing Arts, Spectator Sports, & Related Industries
712	Museums, Historical Sites, & Similar Institutions
713	Amusement, Gambling, & Recreation Industries
721	Accommodation

* Also listed in Advanced Manufacturing

Source: Job Service North Dakota. Derived from Economy.com report for Department of Economic Development and Finance

North Dakota's Tourism industry is officially referred to as its second largest. A recent North Dakota Department of Commerce press release quotes Governor John Hoeven as saying that tourism in North Dakota brought in $3.6 billion in visitor spending in 2005.[7]

The Tourism industry sector draws industry listings for industries directly pertinent to tourism, and all of the infrastructure and supporting services that transport and accommodate visitors of all sorts to North Dakota.

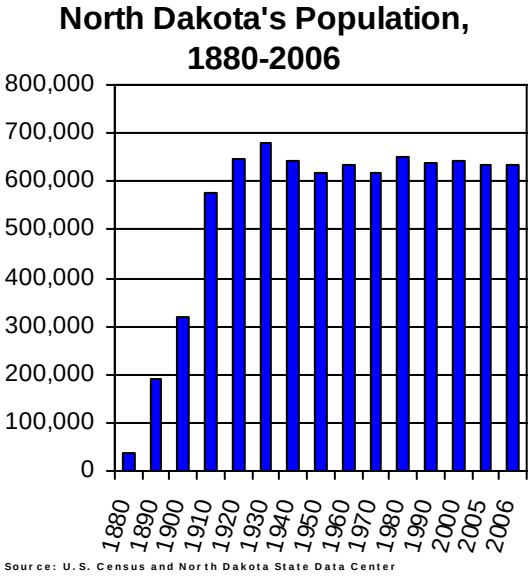
Health Services

Health Services is not an industry that North Dakota has targeted specifically for development. This industry, however, is crucial to any state's economy, and of course, its population in general. Health care is a major contributor to a state or region's quality of life, and is literally a necessity everywhere. Therefore, demand will always be high for health professionals, especially in rural areas where population is sparse and it can sometimes be difficult to lure medical professionals to live and work.

North Dakota's Center for Rural Health has performed extensive needs assessments and has prepared policy briefs and other materials detailing workforce needs for the Health Services industry in North Dakota. These will provide the backbone of further investigation of this industry in the later section on industry workforce needs.

Demographics as Destiny

North Dakota, like all states of the High Plains, is demographically challenged. It is no exaggeration to say that demographic factors underlie virtually all of North Dakota's major workforce challenges.



Slow growth to no growth

North Dakota's total population peaked in 1930 and, with a few ups and downs, has remained nearly constant since.

Three factors have determined North Dakota's demographic history over the past five decades or more:

1. **Depopulation** of most of the state's rural counties. This was due mainly to improved agricultural technology, which led to ever larger average farm average sizes and fewer farms, which meant fewer farmers, which meant fewer merchants and other tradespeople in rural towns.

[7] See http://www.growingnd.com/index.asp?Section=NewsRelease&ShowContent=92

2. **Concentration** of the state's population in a relatively few urban areas.
3. **Net out-migration (domestic emigration)** of the state's population in most age groups to other states of the nation.

From 2000 to 2006, North Dakota's population declined by 6,333 persons, according to the U.S. Census Bureau. That decline developed because net out-migration (17,485) exceeded the state's positive natural increase – that is, excess of births over deaths – of 13,133. Forty-seven of the state's 53 counties (all of them rural counties) and six of its eight planning regions recorded population losses for that period.[8] Two planning regions (Region 5 and Region 7, i.e., the Fargo and Bismarck regions) showed net in-migration. All regions except Region 7 recorded net population movement out of North Dakota.

From 2005 to 2006, the state as a whole recorded a population increase of 1,262, which resulted from a boost in natural increase. Significant population growth came again in the Fargo and Bismarck regions. Also growing during this period was Region 1 (Williston), where in-migration has been gradually increasing over the past several years – presumably because of the booming energy sector. Indeed, the number of counties showing population increases has grown from seven (from 2002 to 2003) to 15 (from 2005 to 2006).

The net result of population changes in North Dakota so far this century has been a continuing depopulation of the rural regions of the state, accompanied by increases in the Fargo and Bismarck metro areas. In very recent years, however, modest population growth has appeared in some rural regions that are home to the expanding Energy sector, and to some American Indian reservations that have recorded increased births in recent years.[9]

Components of 21st century population change

Net international migration has been positive for North Dakota for all except one year (2003) since the turn of the century. In total, 3,364 more foreigners have come to reside in North Dakota than have left the state.

The population growth that has occurred in North Dakota has been due to natural increase, i.e., the excess of births over deaths. Over the period 2000 to 2006, natural increase amounted to 13,133.

But net international migration and positive natural increase were insufficient to avert population decline over the period 2000 to 2006. Net internal out-migration, i.e., the movement of North Dakota residents to other states, has been the cause of population decline statewide and in the counties and regions that experience it. During the first six years of this decade, 21,149 more

[8] The counties that recorded population growth from 2000 to 2006 were Benson, Burleigh, Cass, Morton, Rolette, and Sioux. The regions with expanding populations in that period were Region 5 and Region 7, which respectively are home to the Fargo and Bismarck metro areas.

[9] It is worth noting here that inter-censual data – that is, data reported between decennial census years – are based on statistical estimation rather than a "hard" count. Conversations with the US Census bureau's Larry Sink and Dr. Richard Rathge of the North Dakota State Data Center indicate confidence in inter-censual data for North Dakota as a whole. For some individual counties, and therefore regions (aggregations of counties), these data are somewhat less precise, due to reduced ability to estimate changes statistically to small populations. The accuracy of these data has been questioned by some in North Dakota. Still, they are the best data available to this study, and as such, we use them throughout this section of the report.

North Dakotans left the state than moved to it from other states. More left the state in every year since 2000, except for one year, 2004.

Cumulative Estimates of the Components of Population Change for Planning Regions of North Dakota: April 1, 2000 to July 1, 2006

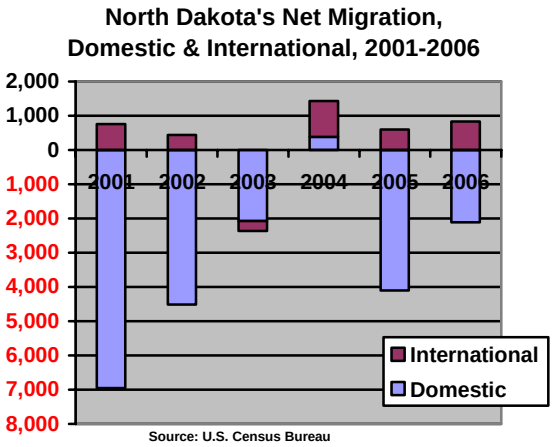
Geographic Area	Total Population Change*	Natural Increase			Net Migration		
		Total	Births	Deaths	Total	Net International Migration	Net Internal Migration
Region 1	-533	8	1,872	1,864	-463	83	-546
Region 2	-5,705	2,335	7,615	5,280	-7,789	-60	-7,729
Region 3	-1,983	1,039	4,089	3,050	-2,896	100	-2,996
Region 4	-2,806	2,194	6,904	4,710	-4,762	702	-5,464
Region 5	7,300	6,171	13,603	7,432	1,693	2,296	-603
Region 6	-4,652	-1,341	3,629	4,970	-3,144	137	-3,281
Region 7	3,681	2,644	9,673	7,029	1,475	329	1,146
Region 8	-1,635	83	2,496	2,413	-1,599	77	-1,676
Total	-6,333	13,133	49,881	36,748	-17,485	3,664	-21,149

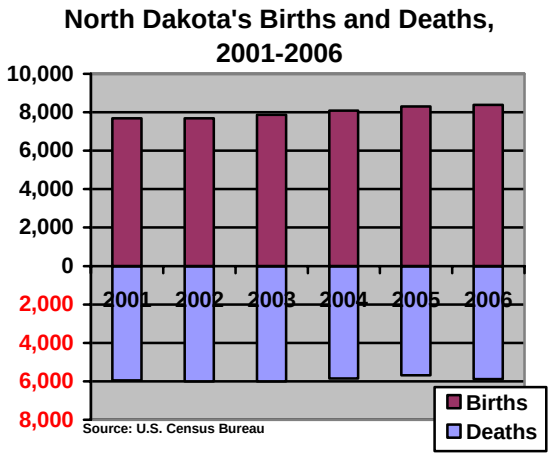
Estimates of the Components of Population Change for Planning Regions of North Dakota: July 1, 2005 to July 1, 2006

Geographic Area	Total Population Change*	Natural Increase			Net Migration		
		Total	Births	Deaths	Total	Net International Migration	Net Internal Migration
Region 1	221	50	350	300	169	12	157
Region 2	-808	481	1,314	833	-1,288	162	-1,450
Region 3	-413	185	666	481	-596	17	-613
Region 4	-152	291	1,102	811	-453	198	-651
Region 5	1,435	1,020	2,213	1,193	400	355	45
Region 6	-434	-138	699	837	-306	23	-329
Region 7	1,465	534	1,607	1,073	925	55	870
Region 8	-52	71	429	358	-128	14	-142
Total	1,262	2,494	8,380	5,886	-1,277	836	-2,113

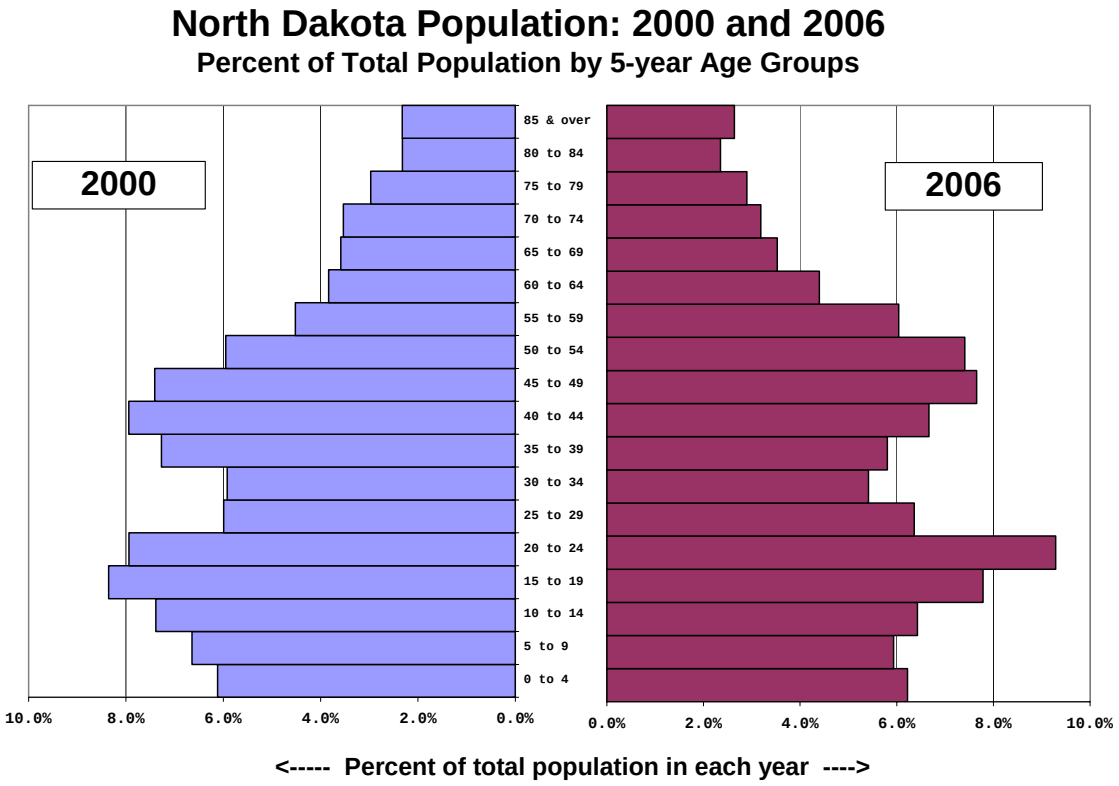
Source: U.S. Census Bureau

To the extent that North Dakota's economy is still growing in spite of these generally downward population trends, it could be said that North Dakota's key industries are doing more work with fewer people.





Boom and Bust: Losing the best and brightest



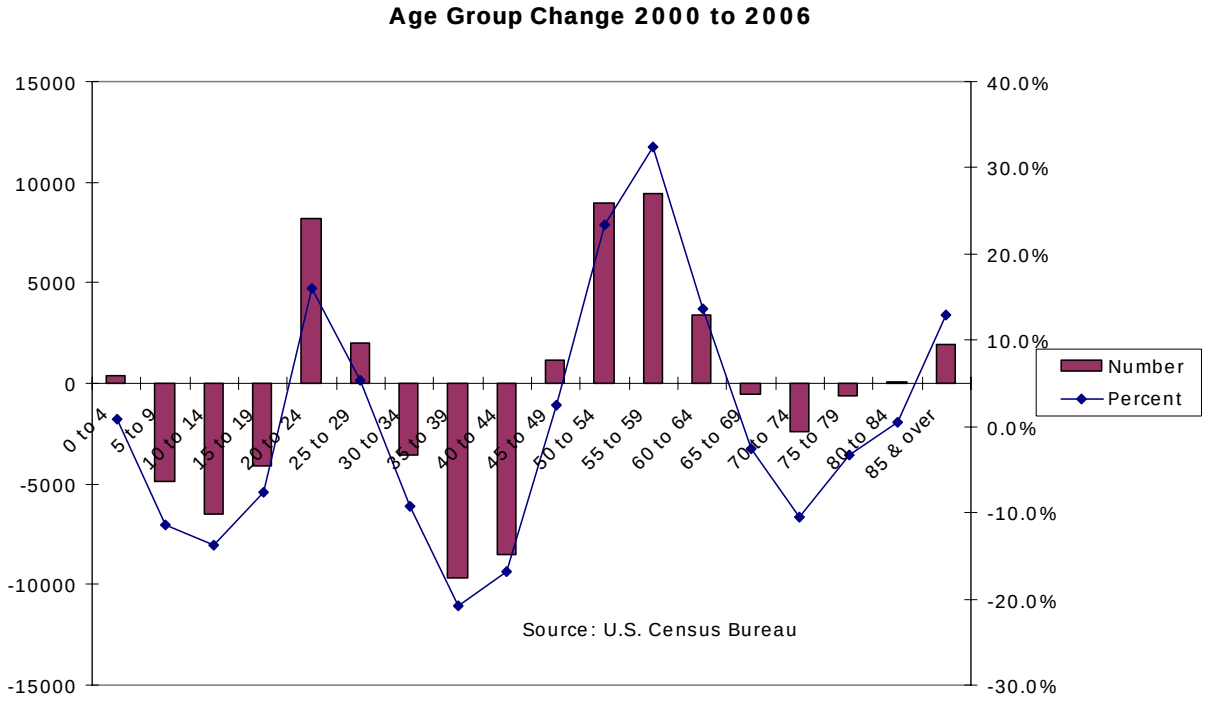
The age structure of North Dakota's population is unique. The first thing to notice from the population pyramid shown above is the huge "Baby Boomer" bulge. In 2000, the Boomers were in their late 30s to early 50s, and their numbers produced a peak centered on the 40 to 44 age group. By 2006, not surprisingly, that peak had moved on to the 45 to 49 age group, with significant numbers in the 50s as well. The movement of the Boomer peaks up the age scale is testimony to the aging of North Dakota's population.

But the Boomer peak and its movement is not what makes North Dakota unique. That is occurring in many states of the nation.

What is different about North Dakota's population pyramids is the population surge that shows in the 15 to 19 and 20 to 24 age groups. An optimistic interpreter might observe the 2000 pyramid and see that eight percent of the state's population was in the 20 to 24 age group, and even more in the 15 to 19 year old group. These data might seem to support the conclusion that this swell of young people is a signal of good news for the future workforce.

But note that by 2006, when those who were 20 to 24 years of age in 2000 were mostly in the 25 to 29 year-old group, these individuals are most noticeable by their absence. From 8% of the population in 2000, that group of young North Dakotans had dropped to somewhat more than 6% in 2006. What happened?

The answer to this question will emerge from the following examination of population trends. Meanwhile, this outflow of young people is problematic for North Dakota's future workforce. The two-bar trough in 2000's population pyramid (age groups 25 to 29 and 30 to 34) had expanded to become a three-bar trough in 2006 (the previous two plus 35 to 39). That signals a potential short supply of workers in their young and middle years, while a growing percentage of the state's workforce moves into the years beyond age 50. It is an issue that warrants more attention.



The preceding graph displays the numeric and percentage changes in population numbers in 18 five-year age groups between 2000 and 2006.

- This graph shows declining numbers in all but three age groups up to age 49. The most notable exceptions are the two age groups in the range from 20 to 29.

- In the age group 20 to 24, for example, there were 8,165 (or 16%) more residents of North Dakota in 2006 than there were in 2000.
- Conversely, there were 21,760 fewer North Dakotans aged 30 to 44 in 2006 than there were in 2000.
- Not surprisingly, population numbers increased greatly in the age groups from 45 to 59, those containing the bulk of the Baby Boomers.

The age group population changes shown in this graph make explicit what the viewer senses when looking at the population pyramids shown earlier.

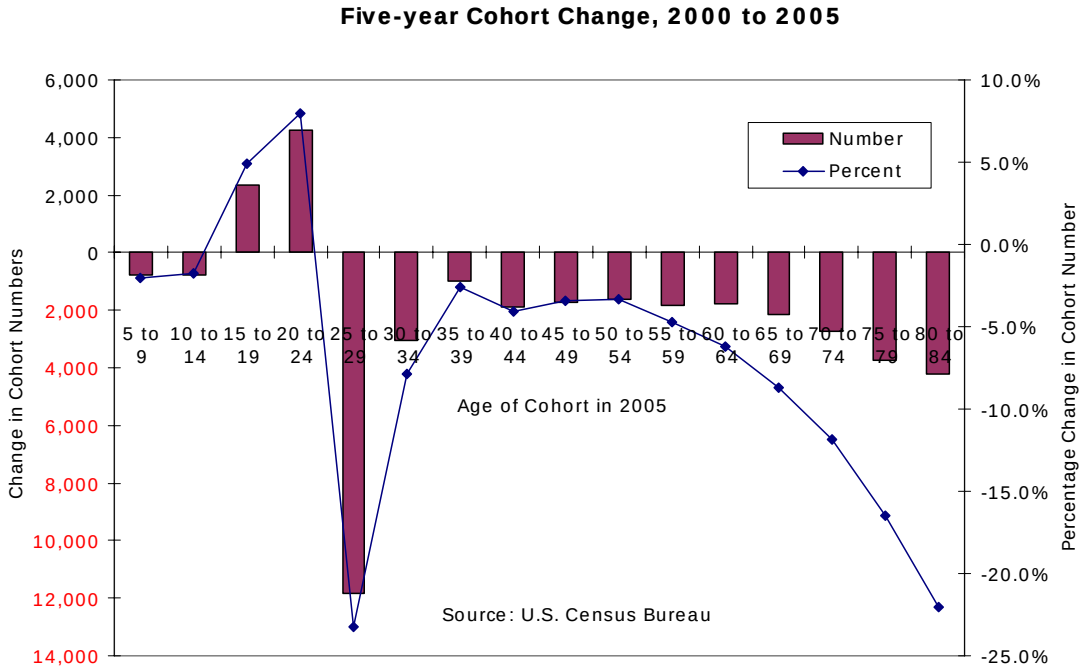
Cohort analysis

Even more revealing of North Dakota's population dynamics are the changes in various cohorts. By a "cohort," we mean a group of persons who were born in the same time period. The chart below deals with 16 different five-year cohorts. Members of the oldest cohort, cohort #16, were born in the period 1922 to 1926. The youngest cohort, cohort #1, contains members born between 1997 and 2001. Members of cohort 16 would have been aged 75 to 79 in 2000, and those who were still living would have been aged 80 to 84 in 2005.[10]

Cohort Roster

Cohort #	Period in which born	Age in 2000	Age in 2005
1	1997 to 2001	0 to 4	5 to 9
2	1992 to 1996	5 to 9	10 to 14
3	1987 to 1991	10 to 14	15 to 19
4	1982 to 1986	15 to 19	20 to 24
5	1977 to 1981	20 to 24	25 to 29
6	1972 to 1976	25 to 29	30 to 34
7	1967 to 1971	30 to 34	35 to 39
8	1962 to 1966	35 to 39	40 to 44
9	1957 to 1961	40 to 44	45 to 49
10	1952 to 1956	45 to 49	50 to 54
11	1947 to 1951	50 to 54	55 to 59
12	1942 to 1946	55 to 59	60 to 64
13	1937 to 1941	60 to 64	65 to 69
14	1932 to 1936	65 to 69	70 to 74
15	1927 to 1931	70 to 74	75 to 79
16	1922 to 1926	75 to 79	80 to 84

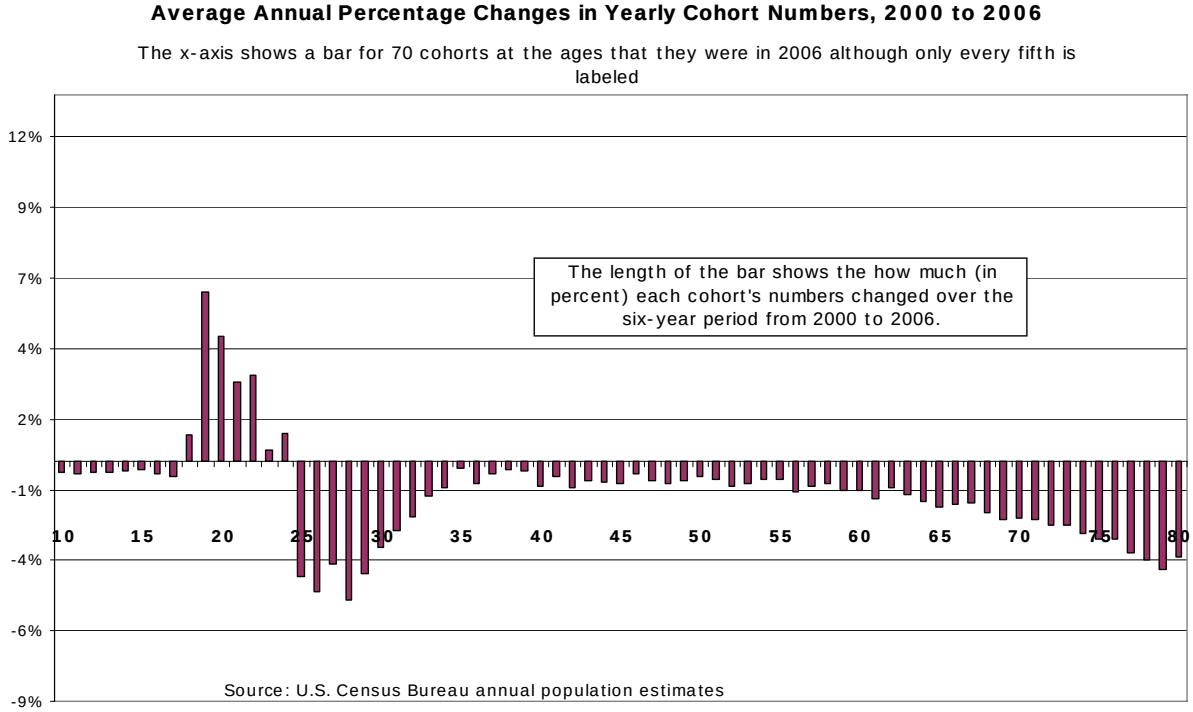
[10] We use 2005 as the terminal year for the cohort analysis displayed in this table because we are working with five-year cohorts. Later, we work with single-year cohorts and revert to 2006 as the terminal year of the analysis. These are technical points and of no interest except to data jockeys.



The chart above shows the numeric and percentage change in the numbers of each of the 16 cohorts between 2000 and 2005. For example, it shows there were 2,343 (or 4.9%) more members of cohort #3 in 2005 (when they were aged 15 to 19) than there were in 2000 (when they would have been aged 10 to 14). Similarly, in cohort #4, there were 4,267 more members residing in North Dakota in 2005 than there were five years earlier.

Strikingly, cohorts #3 and #4 are the only two of the 16 cohorts to show population growth between 2000 and 2005. Most remarkable is the drop of more than 11,800 members of cohort #5. That means that nearly a quarter (23.2%) of the North Dakota residents who were 20 to 24 years old in 2000 were no longer in the state five years later, when they would have been 25 to 29 years old. Furthermore, the exodus was not limited to cohort #5.

With this understanding of cohort analysis, we can dig deeper into the data to see what happened to one-year cohorts between 2000 and 2006. The next chart shows the percentage change in numbers of 70 one-year cohorts. For example, the first bar on the left shows the percentage change in numbers of persons born in 1996 (and who would have been 10 years old in 2005). For convenience, let us name the cohorts by the age that their members would have been in 2006. To avoid crowding along the x-axis, only every fifth cohort is labeled.



Analysis of the average annual change in the members of one-year cohorts over the period 2000 to 2006 reveals more detail of population change in North Dakota.

After modest percentage drops of less than 1% annually in cohorts #10 to #17, we see a 1% rise in cohort #18, followed by a nearly 7% annual increase in cohort #19, of over 4% in cohort #20, and more average annual increases up to and including cohort #24.

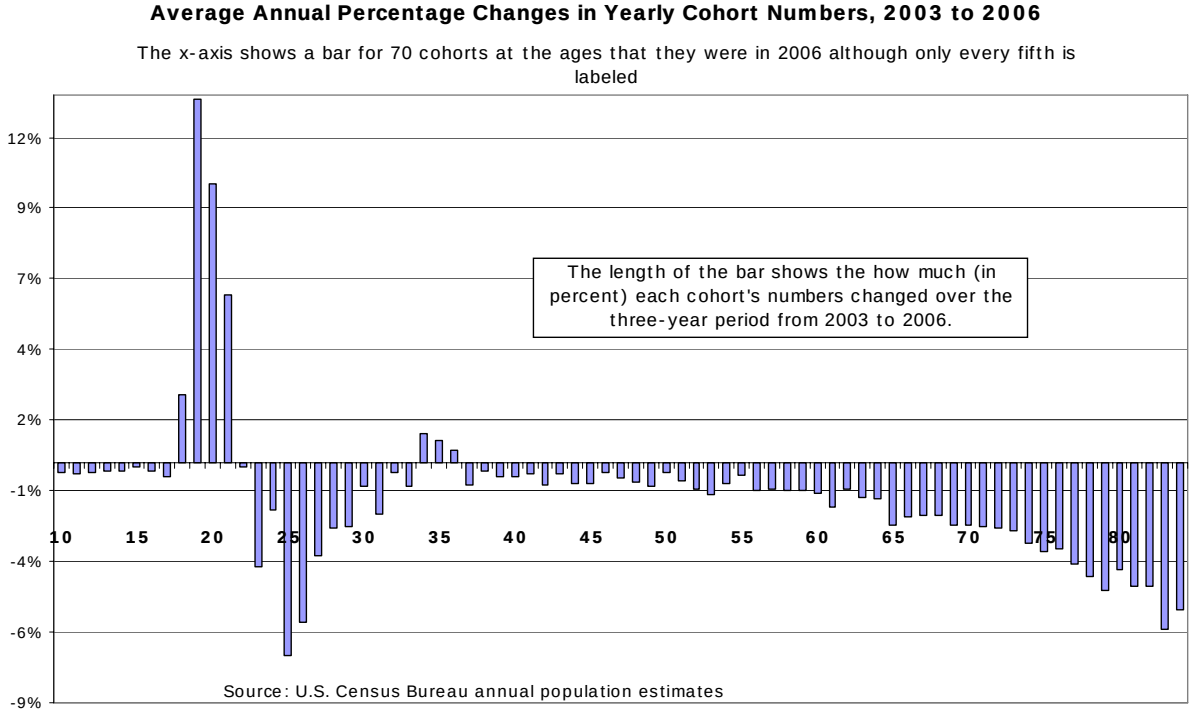
Beginning with cohort 25 (those born in 1981), we see a series of serious drops that continue through cohort 34 (those born in 1972). The growth of 11,095 in cohorts #18 through #24 over the period 2000 to 2006 is more than wiped out by the loss of 18,438 in cohorts #25 through #34.

This extraordinary loss of young adults is followed by a gradual attrition, averaging over 1% each on an average annual basis, in cohorts #35 to #55. The pace of attrition accelerates after cohort #55, reflecting both the rising number of deaths among cohort members and net out-migration from the state.

But are things changing?

Some in North Dakota have expressed a belief that very recent years have brought changes in the patterns observed in the first six years of this decade. Perhaps, it has been suggested, data for the period from 2003 to 2006 (i.e, the last half of the six year span covered by the preceding graph) would show a different pattern.

To test the hypothesis that things are changing, i.e., that the disconcerting loss of young talent shown in the preceding graph has abated, we examine the average annual changes in cohort numbers over the period 2003 to 2006. The next graph displays the results.



The patterns observed in the 2000-2006 graph are displayed even more dramatically in the 2003-2006 graph. The influx of persons into the cohorts who would have been of college age in 2006 increased.[11] The large outflow of persons from cohorts in their later 'twenties and beyond persists for the most part. There was, however, a slight influx of members of cohorts that would have been in their early 30s in the last half of the period.[12] We conclude that the data for the period 2003-2006 do not contradict the conclusions reached in the report that were based on the period 2000-2006. Indeed, they reinforce them.

Hypothesis: Talent loss made visible

We conjecture that the surge of numbers in college-age cohorts and the depletion of older cohorts reflects a two-part trend:

1. Many out-of-state persons enter North Dakota to study in North Dakota universities and colleges, where they remain until they graduate or leave for other reasons.
2. After graduation (or departing otherwise from the educational system), even larger numbers of former students, and others from their mid-twenties onward, depart for destinations beyond North Dakota.

[11] That may attest to the attractiveness of North Dakota's colleges and universities for students from other states. On the other hand, the cohort that would have been 19 in 2006 lost numbers from 2000 to 2003, which makes the gain from 2003 to 2006 larger both in absolute numbers and in percentage terms than from 2000 to 2006. Also note that the annual percentage outflow of persons in cohorts in their later twenties both begins earlier (already noted) and is greater for the last three years than in the period as a whole.

[12] That could perhaps signal the beginning of a return flow of young adults in their family formation years which, if the signal is not false, would be a very good thing.

This trend has a distressing consequence: A major loss of talented people, trained in North Dakota but leaving to live and work elsewhere.

Support for the hypothesis

Virtually all of the estimated population increase between 2005 and 2006 resulted from substantial boosts in the already large increase in the cohorts that turned 18 and 19 in 2006. At 3,922, that boost was 938 more than in 2005. That expansion of college-age residents accounted for over 74% of the state's entire population gain from 2005 to 2006. Meanwhile, the one-year cohorts that would have been aged 25 through 40 in 2006 lost a total of 3,810 of their members.

Nearly two fifths of students in the institutions of the North Dakota University System now come from out of state. In the fall of 2006, that came to 16,127 enrolled students. A quarter of that number (i.e. one year out of a four-year degree) would be approximately 4,000 persons entering North Dakota annually to attend college and university. That number is very close to the 3,922 net gain in the cohorts that turned 18 or 19 in 2006.

We conclude that it is reasonable to think that an influx of college-age students accounts for the surge in numbers of cohorts #18 through #24.

2006 Headcount of Enrolment in the North Dakota University System, by Tuition Residency Status

North Dakota	26,110	61.8%
Manitoba	205	0.5%
Minnesota	9,270	21.9%
Other NHEC states	861	2.0%
Montana	871	2.1%
Saskatchewan	237	0.6%
South Dakota	823	1.9%
Other WICHE states	1,520	3.6%
Other	2,340	5.5%
Non resident subtotal	16,127	38.2%
Grand totals	42,237	100.0%

Source: *2006 Fall Enrollment* , North Dakota Institutions of Higher Education, North Dakota University System

But what about the exodus of cohorts #25 through #34? For that, consider the next table.

Where were the 2004 Graduates of the North Dakota University System One Year Later?

	Graduated in 2004		Retained in ND in 2005		Employed in ND Only	
	Number	Percent	Number	Percent	Number	Percent
North Dakota	4402	69.4%	2876	65.3%	2033	46.2%
Minnesota	1109	17.5%	345	31.1%	231	20.8%
Montana	163	2.6%	56	34.4%	30	18.4%
South Dakota	119	1.9%	33	27.7%	20	16.8%
Other	546	8.6%	117	21.4%	45	8.2%
	6339	100.0%	3427	54.1%	2359	37.2%

Source: *Follow-up Report: 2004 Placements of 2004 NDUS Graduates* , North Dakota Institutions of Higher Education, North Dakota University System, May 2007

The most recent data on what happens to graduates of the North Dakota University System (NDUS) come from a study of those who graduated in 2004. Slightly more than 30% of those graduates originally came from outside North Dakota. Of the 6,339 total NDUS graduates in that year whose records were found, 54.1% were found residing in North Dakota one year later. Nearly two thirds (65.3%) of 2004 graduates originating in North Dakota were still in state one

year later. But only 28% of the 2004 out-of state graduates were still in North Dakota in 2005, and only 17% of them were found to be working only in the state where they were educated.

The NDUS interprets the findings of its study of the Class of 2004 as follows:

> These statistics dispel a common myth that the majority of North Dakota University System graduates leave the state after graduation. As the data indicate, not only do a majority of all NDUS graduates remain in North Dakota, but almost two-thirds of students who had graduated from North Dakota high schools stay as well. The data also show that NDUS graduates are gainfully employed and that non-residents who remain in the state after graduation make a significant contribution to North Dakota's workforce.[13]

Unfortunately, the so-called "common myth" is too close to the truth. In total, North Dakota lost 2,912 persons with college degrees in a single year (2005) from one graduating class alone (that of 2004). How many more of the Class of 2004 exited in 2006? How many more will leave in 2007 and in the years to come? If 45.5% of them left in the first year alone, it is virtually certain that the departures will soon comprise a majority of the Class of 2004 if they do not already. And what about all the other graduating classes, past and future? What about those who enroll from North Dakota and elsewhere but fail to complete their academic programs?

The painful truth is that North Dakota suffers from a dramatic loss of young talent. Young people come to this state to be educated alongside young North Dakotans. Once they are educated, both the incomers and native North Dakotans leave in numbers that are too large for comfort. The numbers of the incoming students and outgoing graduates are, by themselves, sufficient to explain the extraordinary cohort group changes that were documented earlier. How can North Dakota afford to sacrifice such valuable human capital?

A brief qualification

Notwithstanding what has just been said, it would be very premature and probably wrong to conclude that North Dakota should not admit so many out-of-state students to its universities and colleges. There are several reasons for this:

1. Some out-of-state graduates of NDUS institutions (28% in 2005) do indeed remain in North Dakota, even though a majority of them depart soon after graduation. Undoubtedly, those that remain contribute to the economy and society of the state.
2. Many university programs could be so small that they would be uneconomical to maintain if it were not for the fact that substantial numbers of out-of-state students are enrolled in them. So, if North Dakota is to offer such programs to its own resident students, the NDUS needs the outside enrollment boost to enable those programs to continue.
3. Importing students from other states helps contribute to a lively and diverse intellectual environment for North Dakota's institutions of higher learning.

[13] See http://www.ndus.edu/reports/details.asp?id=244

4. Finally, to the extent that the tuition and fees paid by out-of-state students equal or exceed the real marginal costs of their studies, there is no financial downside to their attendance at NDUS institutions.

Current Employment in North Dakota

Labor force growth components

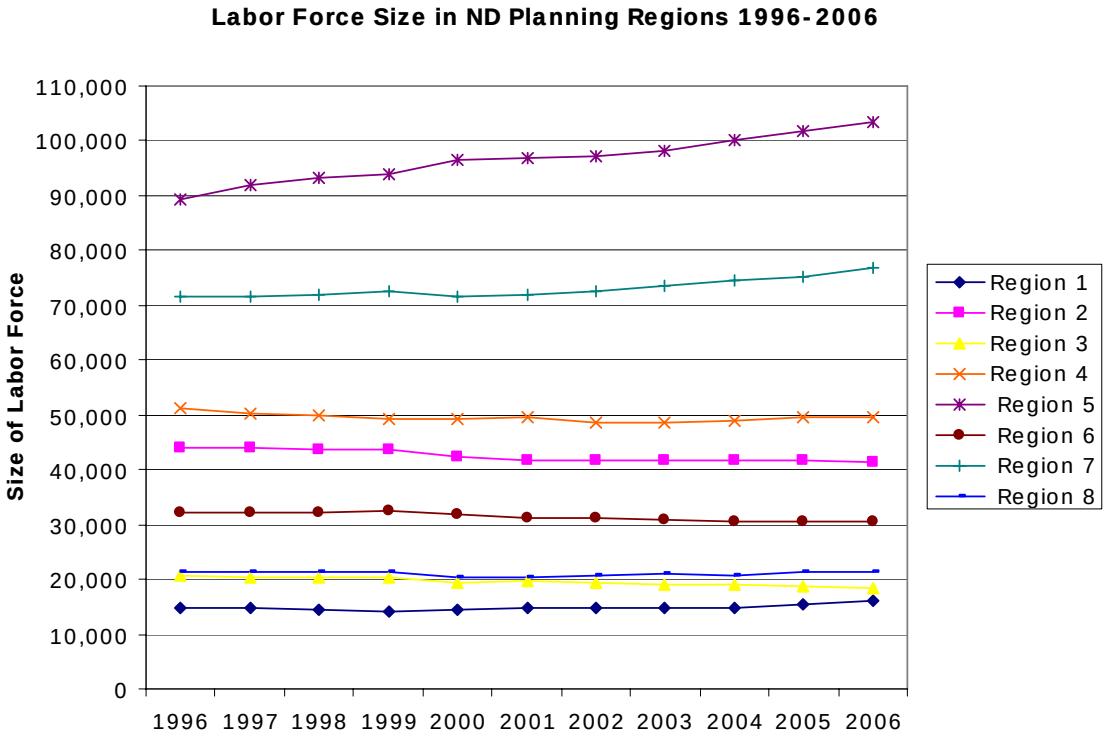
Despite the modest growth of North Dakota's overall population, its overall labor force – that is, the total set of everyone in the state who is either working or actively looking for work – has actually grown in recent years.

Change in Labor Force
1996-2006

	Numeric	Percent
United States	17,485,000	13.1%
North Dakota	12,892	3.7%
Region 1	1,322	8.9%
Region 2	-2,314	-5.3%
Region 3	-2,470	-11.9%
Region 4	-1,637	-3.2%
Region 5	14,080	15.8%
Region 6	-1,628	-5.1%
Region 7	5,411	7.6%
Region 8	131	0.6%

Source: Job Service North Dakota LAUS

Looking more closely at this growth, however, we see that it was driven almost exclusively by the Fargo and Bismarck regions. Indeed, Fargo's labor force growth rate in the last decade is the only one to exceed that of the United States, and the stronger growth here and in two other regions (Bismarck and Williston) was counteracted by stagnation and even decline in the state's other workforce regions. Graphically, this becomes clear in the chart below. The only two workforce regions with labor forces exceeding 50,000 are also the only two whose labor forces are visibly growing.

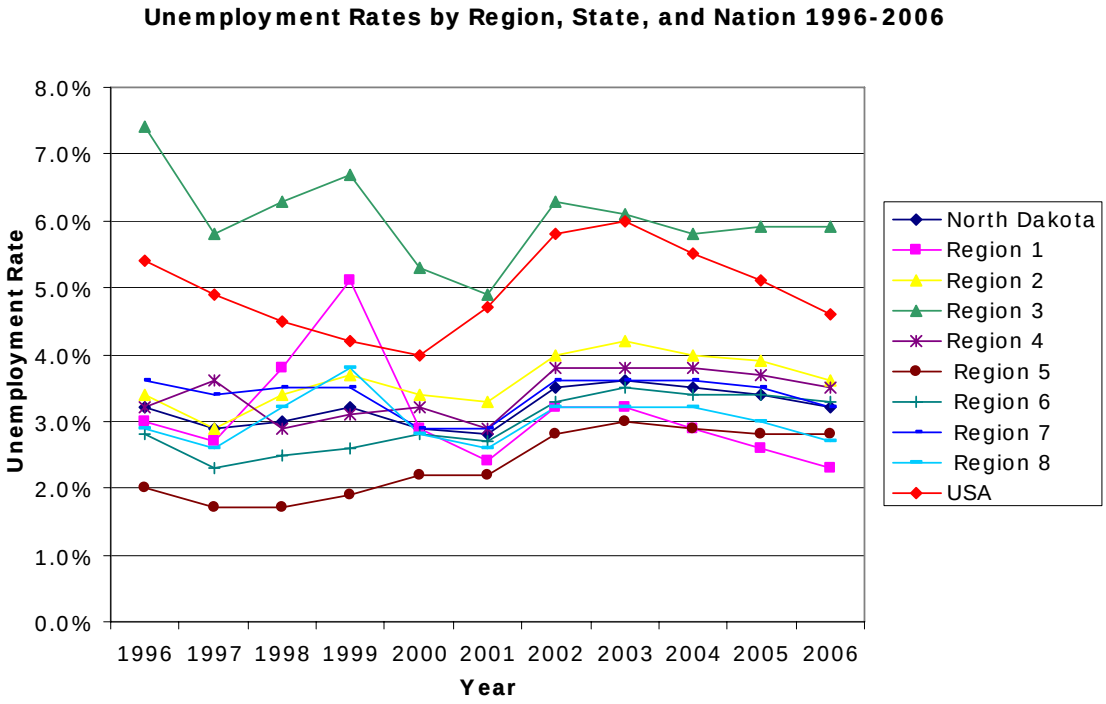


The strong labor force growth in urban areas – and in the Williston region, where recent surges in the energy sector are likely behind employment growth – combined with contraction in less populated, more rural areas is not surprising, given overall demographic trends.

Unemployment

One thing that is true of employment in North Dakota, across most industries and all but one region is this: North Dakota is operating at what is generally considered by economists to be "full employment."[14] This means that nearly everyone in the labor force has a job. This is true at the state level and the regional level, as seen below.

[14] "Full employment" does not mean that 100% of the workforce is employed at any given time; there is always a "natural" rate of unemployment in action. Economists differ on what this natural rate should be, but a general rule of somewhere near 4-4.5% prevails.



North Dakota as a whole, and most of its regions, has seen unemployment rates much lower than those of the nation for a very long time. Only one region, the Devils Lake region (3) has operated outside this trend, experiencing shrinkage in its labor force, but no decrease in unemployment over the last several years. A largely agrarian economy and the influence of high unemployment of the reservation population in the area have contributed to this seemingly anomalous zone of the state.

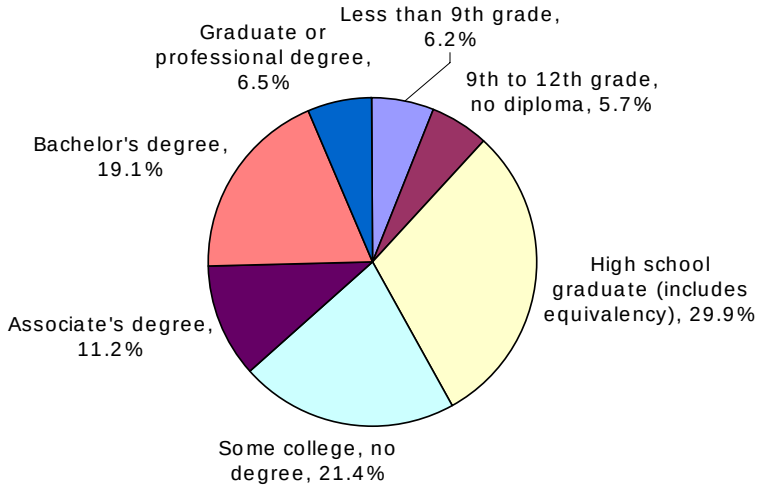
The good news about low unemployment is practically self-evident. However, in a case like North Dakota's, with a comparatively small – and in many places shrinking – labor force, low unemployment means limited availability of workers for the expansion or recruitment of businesses for economic development. North Dakota has approached this issue with a set of "Labor Availability Studies" for its various cities and regions, which are discussed elsewhere in this report. These studies create a more complete and nuanced picture of the available labor force in a particular city or region than observation of the unemployment rate alone would yield.

Education – Workforce Quality Today and Tomorrow

North Dakota takes pride in the quality of its education. In many significant ways, this pride seems to be well-founded. North Dakota's educational performance is solid, even exemplary, leaving some room to improve in several dimensions, but also providing a sturdy building block for that improvement.

Starting with a consideration of the educational attainment of North Dakota's adult population, we find that 88.1% of adults in the state have completed at least a high school education, according to the 2006 American Community Survey by the U.S. Census. This officially places North Dakota 16th among the states, but those that rank ahead of North Dakota are tightly clustered within a few percentage points, behind a high of 90.7% in neighboring Minnesota. In other words, North Dakota is clearly among the vanguard in terms of securing this basic and vital economic building block for its workforce.

Educational Attainment Levels of North Dakota's Adults (25 and older)
2006



Over a quarter of the state's population – 25.6% – has achieved a Bachelor's degree or higher, placing North Dakota in the middle of the rankings – exactly 25th among the 50 states. Less impressive is North Dakota's complement of advanced degree holders, ranking 48th among the 50 states at 6.5%. Almost as high a percentage of North Dakotans have less than a 9th grade education.

When we expand our examination of higher education to Associate's degrees, though, we see that over a third of the state's population has at least this level of education – and perhaps most interestingly, well over half of all North Dakotans have spent some time in post-secondary education. However, 21.4% of the state's adults started down the path of higher education but never finished. This is not far from the national average of 19.5%. Still, if a significant portion of these adults were able to complete their post-secondary education and stay in North Dakota, the educational credentials of the state's adult workforce would increase significantly.

The 2006 Accountability Measures Report from the North Dakota University System hints at the source of the population with incomplete college education. According to the report,

> 34.8 percent of students who attended NDUS two-year colleges completed degrees within three years, and 49.1 percent of four-year students completed degrees within six years, compared to 29.3 percent and 55.8 percent nationwide.[15]

These numbers need not necessarily be troubling, since a survey of those who left NDUS colleges in 2005 and 2006 revealed that a third of the departing students intended to continue their college education at another institution.

On the other hand, if those students seek institutions outside North Dakota, they could contribute to a trend that is troubling. As described elsewhere in this report, North Dakota tends to lose young, educated people. Recruitment and retention of these well-educated individuals will be the most important challenge to the development of the North Dakota workforce in the 21st century.

Meanwhile, for those who remain in the state who have not completed college degrees, it is worth considering efforts to accommodate the needs of individuals with roots in North Dakota – families, permanent residences, etc. – to help them finish a degree and enrich their own economic potential, as well as the state's.

K-12 Performance indicators

Graduation rate

Meanwhile, the ability of the North Dakota K-12 education system to move students to completion remains very strong. A graduation rate of 86.2% in the 2006-2007 school year is outstanding compared to a national average of about 70%.[16] This rate is down from a stunning statewide rate of 94.1% in the 2001-02 school year. However, according to the North Dakota Department of Public Instruction, the official method of calculating graduation rates in the state changed in the 2005-06 school year. Thus, the change from the 2001-02 school year is likely not so dramatic, since the current measurement formula would likely have produced a different percentage than the earlier numbers. The current calculation method reflects a true four-year graduation rate for the age cohort that began school four years before the reported graduation year, and thus presumably reflects a more accurate graduation rate than those that were reported for the state's Adequate Yearly Progress reports for No Child Left Behind.

Still, an 86.1% graduation rate is indeed an exceptionally strong position, one that nearly every other state in the nation would – and should – envy. It could be improved still more. An 86% graduation rate still means that nearly 14% of the state's high school students are failing to achieve this vital milestone, and in the 21st century economy, anyone without a high school diploma will truly be left behind.

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[15] From The NDUS 2006 Accountability Measures Report, *Creating a University System for the 21st Century*, page 11.

[16] As reported by the Alliance for Excellent Education. See http://www.all4ed.org/publications/wcwc/National_wc.pdf.

Dropouts

The number of people who fail to graduate from one class cohort comprises an informal four-year dropout rate for that cohort. Some, however, may fail to graduate for reasons other than dropping out, so we consult other sources directly to zero in on dropouts. To investigate year-to-year dropouts, we examine individual school districts' reported dropout rates. As the table below indicates, dropouts – as reported officially by the year-to-year rates – are mostly under relatively good control in North Dakota schools.

North Dakota High School Dropout Rates

School District	Dropouts	Membership	Dropout Rate
FT TOTTEN	19	171	11.1%
DUNSEITH	18	193	9.3%
BELCOURT	61	902	6.8%
WARWICK	5	99	5.1%
WILLISTON	46	1127	4.1%
WEST FARGO	87	2522	3.4%
EIGHT MILE	4	120	3.3%
WAHPETON	22	707	3.1%
MADDOCK	3	106	2.8%
MANDAN	42	1608	2.6%
HANKINSON	4	156	2.6%
DEVILS LAKE	24	960	2.5%
MANDAREE	2	82	2.4%
BISBEE-EGELAND	1	41	2.4%
BELFIELD	3	124	2.4%
DRAYTON	2	84	2.4%
HARVEY	6	272	2.2%
GOLDEN VALLEY	1	46	2.2%
FARGO	109	5091	2.1%
OAKES	5	235	2.1%
NORTHWOOD	3	149	2.0%
STANLEY	3	156	1.9%
MINOT	57	3003	1.9%
SAWYER	1	57	1.8%
POWERS LAKE	1	59	1.7%
STARKWEATHER	1	62	1.6%
PARK RIVER	3	189	1.6%
KILLDEER	3	191	1.6%
CARRINGTON	5	338	1.5%
State of ND	**683**	**48519**	**1.4%**
STEELE-DAWSON	2	143	1.4%
HAZEN	5	360	1.4%
VALLEY	1	74	1.4%
WIMBLEDON-COURTENAY	1	75	1.3%
KENMARE	2	153	1.3%
WASHBURN	2	164	1.2%
NESSON	1	84	1.2%

CAVALIER	3	266	1.1%
GRAFTO	5	453	1.1%
GARRISON	2	185	1.1%
BEACH	2	188	1.1%
JAMESTOWN	13	1240	1.0%
TURTLE LAKE-MERCER	1	96	1.0%
DICKINSON	14	1348	1.0%
LIDGERWOOD	1	100	1.0%
RUGBY	3	320	0.9%
GLEN ULLIN	1	107	0.9%
LISBON	3	321	0.9%
BOWMAN	2	217	0.9%
THOMPSON	2	218	0.9%
MONTEFIORE	1	111	0.9%
WISHEK	1	113	0.9%
VELVA	2	229	0.9%
LAKOTA	1	119	0.8%
NORTHERN CASS	2	245	0.8%
NEW TOWN	3	368	0.8%
LANGDON AREA	2	290	0.7%
LARIMORE	2	291	0.7%
BISMARCK	34	5171	0.7%
MCKENZIE CO	2	313	0.6%
DAKOTA PRAIRIE	1	161	0.6%
ELLENDALE	1	167	0.6%
ENDERLIN	1	171	0.6%
MOHALL-LANSFORD-SHERWOOD	1	171	0.6%
LEWIS & CLARK	1	176	0.6%
VALLEY CITY	3	608	0.5%
BEULAH	2	428	0.5%
NORTH BORDER	1	227	0.4%
GRAND FORKS	14	3596	0.4%
KINDRED	1	314	0.3%

Source: North Dakota Department of Public Instruction

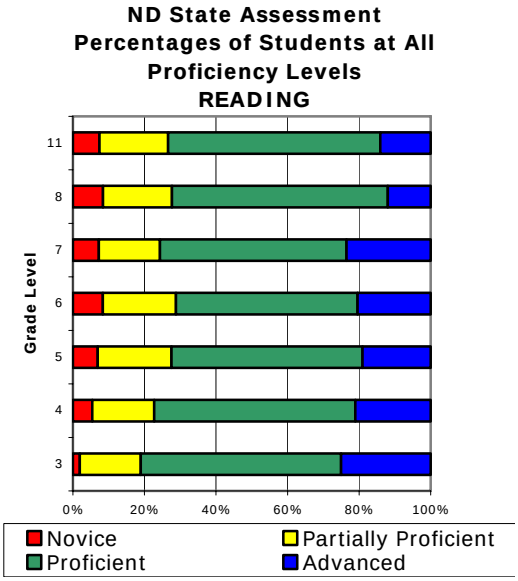
These 70 school districts are merely the ones who recorded dropouts in the 2005-06 school year. An additional 115 school districts had no recorded dropouts for the year. A handful of districts at the top of the list reported dropout rates significantly higher than the state's overall 1.4% rate, and a small number scattered across the list indicated significant numbers of dropouts. Perhaps not surprisingly, the larger school districts surrounding Fargo and Bismarck recorded more dropouts, but out of a higher population, the dropout rate is still relatively low. While any number of dropouts is always a concern for educators, it seems that most schools in North Dakota need little help keeping students in school.[17]

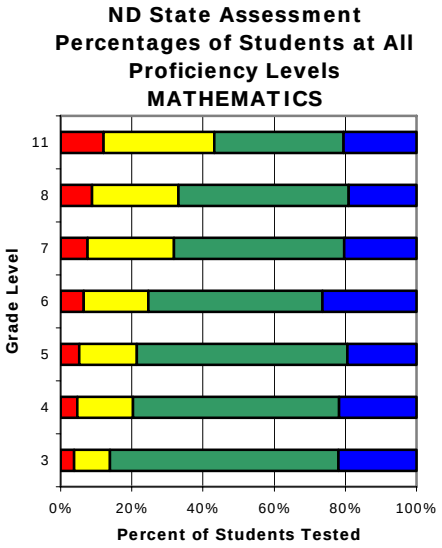
[17] It must be noted here that this is not universally true for all groups of North Dakotans. Among the state's tribal population, rates of non-completion are higher. Census data suggest that the rates of individuals aged 16-19 who are neither working nor in school ranges from 10-20% among North Dakota's reservations.

The North Dakota State Assessment

Completing a K-12 education is a vital step toward economic strength for any worker. Just as important is the quality of that education. The success rate of students taking standardized tests has become a convenient barometer for educational performance, and indeed, a critical criterion in recent years. By this standard, North Dakota's students seem to be performing well.

The North Dakota State Assessment is administered to students at every grade from 3rd to 8th, then once during high school at the 11th-grade level. The following charts display each grade level's performance on the 2005-2006 school year's Assessment, in the two major areas of Reading and Mathematics.

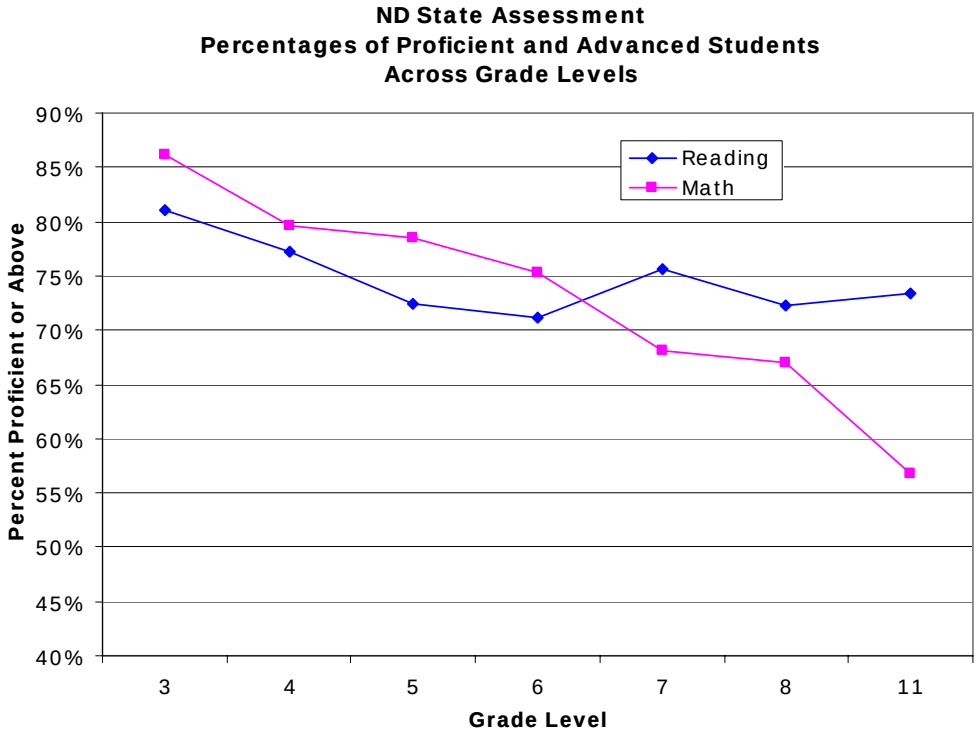




Source: North Dakota DPI. Analysis by Workforce Associates, Inc.

The lower grades display impressive performance on the 2005-06 Assessment, with vast majorities meeting or exceeding state standards. In both reading and mathematics, we can observe a general downward drift in performance as the grade levels increase. This drift is fairly moderate in reading, and about three quarters of high school juniors still display proficiency in reading.

Grade-to-grade variation in mathematics, however, is much more dramatic, displaying a clear downward trend from over 85% in the 3rd grade to just over 55% in the 11th grade. A majority of juniors are still passing their mathematics Assessment, but just barely. Especially pronounced are the differences between the performance of the 6th and 7th, and the 8th and 11th grades. Respective declines of eight and 10 percentage points at each of these intervals are evident in the graph below. This graph displays the grade-to-grade variation more clearly, demonstrating the substantial drop in performance between grades 8 and 11.



The middle school-high school performance drop is not unique to North Dakota. Workforce Associates, Inc. has performed these grade-to-grade testing comparisons in many areas, and the same trends seem to apply, especially in mathematics. The performance of North Dakota's K12 education system, as measured by the Assessment, can properly be described as exemplary at the lower grades. Somewhere between middle school and their junior year of high school, however, North Dakota's students seem to find increasing difficulty with math. Given the importance of mathematics to so many of the industries within North Dakota's target industry sectors, this trend deserves serious scrutiny.

Prospects, Gaps, and Barriers to Growth

The supply side – labor availability and advantages

Analysis of Occupational Location Quotients

In which occupations (and associated skill sets) does North Dakota have a "comparative advantage?" One way to approach that question is to rephrase it and ask, "Which occupations are more heavily represented in North Dakota's workforce than in the United States as a whole?" And, while we are at it, we can also ask about those occupations that are sparsely represented in the North Dakota workforce.

To answer those rephrased questions, we compute an "Occupational Location Quotient" or "LQ" for each occupation for which data are available. The first step in this computation is to find each

occupation's share (in percent) of the total North Dakota workforce. That percent is displayed in the fourth column from the left in the tables that follow. Then, for each occupation, we divide the percent just calculated by the same occupation's share of the entire U.S. workforce. The result is the LQ for the occupation in question.

Also displayed on all these tables is the median annual salary recorded for each occupation in North Dakota in 2006 and its ratio (expressed in percentage terms) to the national median for that same occupation.

The 25 highest LQs

The first table presents the 25 occupations in North Dakota with the highest LQs, taken from the set of all LQs of 1.2 or higher.[18] An LQ of 1.2 for a given occupation means that is share of North Dakota's employed workforce is 120% of what it is in the nation as a whole. The larger the LQ is for an occupation, the more heavily that occupation is represented in the North Dakota workforce relative to what it is nationally.

Top 25 Occupations With High Occupational Location Quotients in North Dakota, 2006

SOC	Occupational Title	Employment, May 2006		Occupational	Median Salary	
		Number	% of total	L.Q.	ND 2006	% of US
17-1021	Cartographers and photogrammetrists	520	0.2%	**17.97**	$ 28,330	59%
17-2021	Agricultural engineers	80	0.0%	**10.36**	$ 65,690	99%
25-1041	Agricultural sciences teachers, postsecondary	260	0.1%	**10.15**	$ 76,010	101%
49-3041	Farm equipment mechanics	710	0.2%	**9.51**	$ 29,420	100%
47-5013	Service unit operators, oil, gas, and mining	580	0.2%	**9.03**	$ 40,240	122%
47-5011	Derrick operators, oil and gas	320	0.1%	**7.47**	$ 45,140	125%
39-3012	Gaming and sports book writers and runners	320	0.1%	**7.11**	$ 18,940	101%
47-5012	Rotary drill operators, oil and gas	310	0.1%	**6.80**	$ 44,460	116%
13-1021	Purchasing agents and buyers, farm products	220	0.1%	**6.63**	$ 53,010	113%
53-7011	Conveyor operators and tenders	800	0.2%	**6.31**	$ 25,360	93%
49-9011	Mechanical door repairers	220	0.1%	**5.74**	$ 27,120	86%
53-7073	Wellhead pumpers	190	0.1%	**5.65**	$ 35,380	98%
45-4011	Forest and conservation workers	120	0.0%	**5.56**	$ 21,910	105%
25-9021	Farm and home management advisors	170	0.1%	**5.42**	$ 40,120	96%
39-3011	Gaming dealers	1100	0.3%	**5.24**	$ 16,400	111%
19-4011	Agricultural and food science technicians	250	0.1%	**5.14**	$ 32,980	104%
11-9131	Postmasters and mail superintendents	330	0.1%	**4.90**	$ 45,600	82%
19-1031	Conservation scientists	180	0.1%	**4.44**	$ 56,930	104%
47-5071	Roustabouts, oil and gas	460	0.1%	**4.42**	$ 31,820	124%
39-9041	Residential advisors	520	0.2%	**4.24**	$ 19,510	86%
51-7042	Woodworking machine setters, operators, and tenders, except sawing	970	0.3%	**3.92**	$ 23,730	99%
27-3011	Radio and television announcers	360	0.1%	**3.55**	$ 23,710	98%
25-1113	Social work teachers, postsecondary	70	0.0%	**3.52**	$ 44,330	82%
47-3012	Helpers--carpenters	920	0.3%	**3.49**	$ 21,790	94%
45-2011	Agricultural inspectors	130	0.0%	**3.47**	$ 33,970	89%

Source: Bureau of Labor Statistics, May 2006 State Occupational Employment and Wage Estimates. Analysis by Workforce Associates, Inc.
http://www.bls.gov/oes/current/oessrcst.htm

[18] The complete list of all occupations with LQs of 1.2 or higher is contained in an appendix to this report.

This list is populated almost entirely by occupations within North Dakota's Agriculture and Energy sectors – this is not surprising, considering that these sectors themselves are a much larger part of North Dakota's economy than of the nation's. Some representation of North Dakota's Tourism – specifically, gaming operations – and Manufacturing industry sectors is present as well. But this list is dominated by these two important economic drivers.

Encouragingly, wages in nearly all of these professions, while not all necessarily high in absolute terms, are highly competitive with median earnings for the same jobs at the national level, most between 90-115% of national levels. The sole curious exception is cartographers, whose high concentration and low relative salary bears some explanation. (If these are primarily military employees, this might explain the wage differential, but the available data do not provide a way to verify that hypothesis.)

Selected key occupations with high LQs

Looking at the entire set of North Dakota occupations with significantly high LQs (1.2 or greater), it is possible to pick from this list a number of occupations that are especially relevant to North Dakota's desired targets for economic and workforce development. They include the following occupations.

Selected Key Occupations With High Occupational Location Quotients in North Dakota, 2006

SOC	Occupational Title	Employment, May 2006		Occupational	Median Salary	
		Number	% of total	L.Q.	ND 2006	% of US
17-2021	Agricultural engineers	80	0.0%	**10.36**	$ 65,690	99%
25-1041	Agricultural sciences teachers, postsecondary	260	0.1%	**10.15**	$ 76,010	101%
19-4011	Agricultural and food science technicians	250	0.1%	**5.14**	$ 32,980	104%
19-1031	Conservation scientists	180	0.1%	**4.44**	$ 56,930	104%
19-1029	Biological scientists, all other	190	0.1%	**2.98**	$ 55,260	91%
19-1012	Food scientists and technologists	60	0.0%	**2.70**	$ 48,270	90%
25-1191	Graduate teaching assistants	750	0.2%	**2.63**	$ 27,790	100%
25-1072	Nursing instructors and teachers, postsecondary	250	0.1%	**2.51**	$ 45,040	81%
29-1125	Recreational therapists	150	0.0%	**2.46**	$ 33,670	96%
19-1013	Soil and plant scientists	60	0.0%	**2.21**	$ 50,090	89%
25-1122	Communications teachers, postsecondary	120	0.0%	**2.01**	$ 49,230	93%
25-1011	Business teachers, postsecondary	340	0.1%	**1.99**	$ 55,220	89%
19-4021	Biological technicians	360	0.1%	**1.99**	$ 26,510	74%
29-1124	Radiation therapists	70	0.0%	**1.93**	$ 62,220	94%
29-1071	Physician assistants	300	0.1%	**1.88**	$ 66,860	89%
25-1052	Chemistry teachers, postsecondary	80	0.0%	**1.62**	$ 52,360	86%
29-1122	Occupational therapists	360	0.1%	**1.61**	$ 50,560	84%
29-2061	Licensed practical and licensed vocational nurses	2920	0.9%	**1.60**	$ 32,050	88%
29-2071	Medical records and health information technicians	620	0.2%	**1.49**	$ 25,020	89%
25-1032	Engineering teachers, postsecondary	120	0.0%	**1.48**	$ 62,940	82%
53-3032	Truck drivers, heavy and tractor-trailer	6250	1.9%	**1.47**	$ 33,100	94%
25-1021	Computer science teachers, postsecondary	130	0.0%	**1.40**	$ 50,570	88%
29-1123	Physical therapists	490	0.1%	**1.24**	$ 59,440	90%
49-9069	Precision instrument and equipment repairers, all other	40	0.0%	**1.22**	$ 46,730	101%

Source: Bureau of Labor Statistics, May 2006 State Occupational Employment and Wage Estimates. Analysis by Workforce Associates, Inc.
http://www.bls.gov/oes/current/oessrcst.htm

Some of these occupations employ large numbers of people. Others offer highly desirable salaries. Some require high skills and/or high education levels, and some are simply crucial to the support and growth of North Dakota's target industry sectors and economy in general.

Several major groups of occupations make themselves apparent from this list:

- First, occupations in Agriculture are, well represented again. Particularly encouraging is the number of highly skilled scientific and technical fields within agriculture that enjoy an occupational advantage in North Dakota. This is very promising for the development of the Value Added Agriculture sector.

- Another promising sign is the representation of postsecondary instructors in a variety of fields relevant to North Dakota's target industries, including agricultural science, business, communications, and computer science. This indicates that North Dakota has the educational infrastructure to help generate the "pipeline" of workers for the future growth of its key industries.

- There is a significant number of health care professions represented among this list, a good sign for the workforce needs of the North Dakota Health Services sector, which constantly demands workers both in the state and nationally. Earnings for these professions do tend to trail the national median slightly, which presents possible recruitment and retention challenges for a very highly sought-after class of workers.

Selected occupations with low LQs

The next table presents similar information on occupations with LQs of 0.8 or lower. That means that their share of the North Dakota workforce is only 80% (or less) of the national level.[19]

A listing of the "bottom 25" occupational location quotients would be neither as informative nor as useful as that for the top 25, because many of the occupations for which North Dakota exhibits extremely low relative concentration have no particular relevance to the progress of its economy, in the direction that the state's workforce and economic development leaders would like to see. For example, no one would be surprised by – or especially interested in – the fact that North Dakota employs a relatively tiny share of parking lot attendants.

With this in mind, this table presents a selection of those occupations that North Dakota might like to see more well-represented, in order to support its target industry sectors. They include the following.

[19] Again, a complete listing of North Dakota's low-LQ occupations follows this study in an appendix.

Selected Occupations With Low Occupational Location Quotients in North Dakota, 2006

SOC	Occupational Title	Employment, May 2006 Number	Employment, May 2006 % of total	Occupational L.Q.	Median Salary ND 2006	Median Salary % of US
25-3099	Teachers and instructors, all other	170	0.1%	**0.12**	$ 42,790	149%
51-2099	Assemblers and fabricators, all other	140	0.0%	**0.19**	$ 19,670	74%
13-1081	Logisticians	40	0.0%	**0.20**	$ 57,790	91%
29-2099	Health technologists and technicians, all other	40	0.0%	**0.22**	$ 37,190	106%
51-9199	Production workers, all other	220	0.1%	**0.30**	$ 24,030	97%
51-4011	Computer-controlled machine tool operators, metal and plastic	110	0.0%	**0.31**	$ 32,170	102%
51-4111	Tool and die makers	80	0.0%	**0.33**	$ 35,860	81%
15-1099	Computer specialists, all other	150	0.0%	**0.33**	$ 55,730	81%
19-4031	Chemical technicians	50	0.0%	**0.33**	$ 23,720	60%
31-9092	Medical assistants	420	0.1%	**0.41**	$ 24,810	94%
17-2199	Engineers, all other	160	0.0%	**0.41**	*	88%
17-2041	Chemical engineers	30	0.0%	**0.41**	$ 74,730	95%
19-4099	Life, physical, and social science technicians, all other	60	0.0%	**0.41**	$ 42,340	112%
15-1032	Computer software engineers, systems software	340	0.1%	**0.41**	$ 64,440	75%
51-4081	Multiple machine tool setters, operators, and tenders, metal and plastic	100	0.0%	**0.41**	$ 23,540	77%
51-4041	Machinists	440	0.1%	**0.45**	$ 34,060	98%
17-3029	Engineering technicians, except drafters, all other	90	0.0%	**0.45**	$ 41,970	77%
29-2052	Pharmacy technicians	370	0.1%	**0.52**	$ 26,320	103%
29-2032	Diagnostic medical sonographers	60	0.0%	**0.53**	$ 56,590	99%
51-2022	Electrical and electronic equipment assemblers	310	0.1%	**0.58**	$ 22,280	87%
49-2094	Electrical and electronics repairers, commercial and industrial equipment	120	0.0%	**0.60**	$ 45,980	102%
29-2033	Nuclear medicine technologists	30	0.0%	**0.61**	$ 52,260	84%
19-2031	Chemists	130	0.0%	**0.64**	$ 52,920	88%
11-9041	Engineering managers	300	0.1%	**0.64**	$ 85,120	81%
49-9043	Maintenance workers, machinery	140	0.0%	**0.68**	$ 29,250	85%
15-1051	Computer systems analysts	770	0.2%	**0.68**	$ 47,790	69%
15-1021	Computer programmers	690	0.2%	**0.69**	$ 41,600	64%
15-1071	Network and computer systems administrators	510	0.2%	**0.70**	$ 44,860	72%
29-9099	Healthcare practitioners and technical workers, all other	90	0.0%	**0.70**	$ 47,450	128%
15-1041	Computer support specialists	930	0.3%	**0.71**	$ 30,530	74%
17-2112	Industrial engineers	370	0.1%	**0.74**	$ 62,440	91%
17-2141	Mechanical engineers	410	0.1%	**0.74**	$ 61,170	88%
25-1042	Biological science teachers, postsecondary	100	0.0%	**0.76**	$ 50,500	73%
17-3027	Mechanical engineering technicians	90	0.0%	**0.76**	$ 42,000	92%
11-3051	Industrial production managers	300	0.1%	**0.77**	$ 62,840	81%
49-9099	Installation, maintenance, and repair workers, all other	260	0.1%	**0.79**	$ 36,460	111%
31-2021	Physical therapist assistants	120	0.0%	**0.80**	$ 28,800	70%

Source: Bureau of Labor Statistics, May 2006 State Occupational Employment and Wage Estimates
http://www.bls.gov/oes/current/oessrcst.htm

Several general observations can be made concerning these low-concentration occupations in North Dakota.

- A large number of high-technology occupations within several of North Dakota's target industry sectors are represented in this list, especially in Advanced Manufacturing and Information Technology.

  - For example, industrial maintenance, CNC operators, machinists, and engineers are all needed to create and implement advanced equipment and processes in Advanced Manufacturing operations.

  - Programmers, systems analysts, network administrators, and all other computer-related professions are of course necessary to advance IT's presence and progress.

- Curiously, many of the occupations on this list also feature competitive wages with regard to the US median.

  - In the category of "all other" teachers, it is interesting to see that wages exceed the national median here by half, yet they are not very strongly represented at all among North Dakota's workforce. This suggests that educational institutions may be paying premiums as an incentive to teachers to come and stay in these professions.[20] This may also be true of some Health Services occupations on this list.

  - Many of the low-concentration fields in Information Technology, however, do not seem to offer very competitive wages. This is addressed further in an assessment of the prospects of each North Dakota target industry sector.

- Some Health Services occupations also appear on the low side of the LQ range. Some of this may simply be explained by smaller demand due to smaller population, some may indicate current or potential shortages of key occupations. More on this will be examined with a discussion of the Health Services sector later in this report.

Labor Availability Studies

Location Quotient approaches the idea of workforce composition and quality by a single measurement. North Dakota has created, in a series of "labor availability studies," a more dimensional appraisal of the full spectrum of workers potentially available for work within the state.

Surveying workers in a selection of cities, counties, and other areas throughout the state, Job Service North Dakota and research partners at the University of North Dakota have created reports detailing several kinds of "potential job seekers" throughout the state. These studies include not only those currently unemployed, but attempt to capture as well those who are employed but are interested in seeking other employment or a second job, and those discouraged from looking.

The result is a collection of reports that bring together vital information about the quantity and quality of workers potentially available to work in any given area, including detail about their

[20] Depending on what specific kinds of teachers are included in "all other," the case may simply be that there is a small number of highly specialized teachers whose specialization commands a high salary.

professions, education, and experience, information on current wages and benefits, and attitudes toward work (e.g. individuals' reasons for changing jobs). The following table shows aggregations from each report concerning the number of potential job seekers in each survey area and the percentage these job seekers represent of the total adult population of the area. (All surveys were published in 2006, except Bismarck-Mandan, for which a 2007 draft version was available.)

North Dakota Labor Availability Summary
Potential Labor Force Estimates by Area

Area	Region	Potential Labor Force	% of Adult Pop.
Tioga	1	11,362	59.0%
Bottineau	2	8,205	53.0%
Kenmare	2	30,760	56.0%
Minot	2	39,137	59.0%
Stanley	2	3,220	60.0%
Towner	2	4,182	52.0%
Binford	3	6,602	52.0%
Cando	3	15,092	55.0%
Devils Lake	3	9,948	52.0%
Devils Lake Regional Partnership	3	13,014	55.0%
Langdon	3	8,284	51.0%
Rolla	3	8,481	56.0%
Grand Forks	4	72,279	66.0%
Pembina (County)	4	12,801	55.0%
Walsh (County)	4	25,113	61.0%
Fargo-Moorhead	5	97,426	62.2%
Finley	5	7,478	57.0%
Hope	5	21,552	56.0%
Wahpeton	5	10,552	56.0%
Carrington	6	3,730	50.0%
Cooperstown	6	3,344	49.0%
Hannaford	6	12,591	53.0%
Jamestown	6	17,069	56.0%
Oakes	6	27,623	60.0%
Valley City	6	18,795	56.0%
Bismarck-Mandan	7	64,391	66.0%
Center	7	4,009	62.0%
Garrison	7	1,649	50.0%
Linton	7	5,453	48.0%
Mercer (County)	7	8,855	53.0%
Steele	7	1,975	50.0%

Source: Job Service North Dakota

The results show that – perhaps surprisingly – the potential job seeker population in almost any given area of North Dakota comprises at least half of the adult population.[21] Further investigation reveals that in all areas surveyed, the largest part of this population consists of

[21] No attempt was made to aggregate these numbers for all of North Dakota, since (a) the sum of these surveyed areas would not represent the entire state's population, and (b) some of these areas actually overlap, so double counting would distort the accuracy of the sum.

those currently employed but willing to change jobs if a better opportunity arises. This portion of each surveyed area's workforce accounts for 15-25% of its adult population alone. It might safely be said that this is true of a significant portion of the workforce nationwide, and the presence of so many willing job-changers also raises the macro-level question of who will be available to do their jobs if they leave for other positions.

However, these labor availability studies do provide a very useful cross-section of information on the workforce in each of these areas. The utility of studies like these in a state with low population and very low unemployment is obvious, especially for economic developers and those seeking to establish or locate businesses in North Dakota. It is usually very difficult to obtain useful, current information about the availability of labor in an area outside the realm of those already looking for jobs or out of work. These are a convenient tool for the promotion of workforce and economic development across North Dakota.[22]

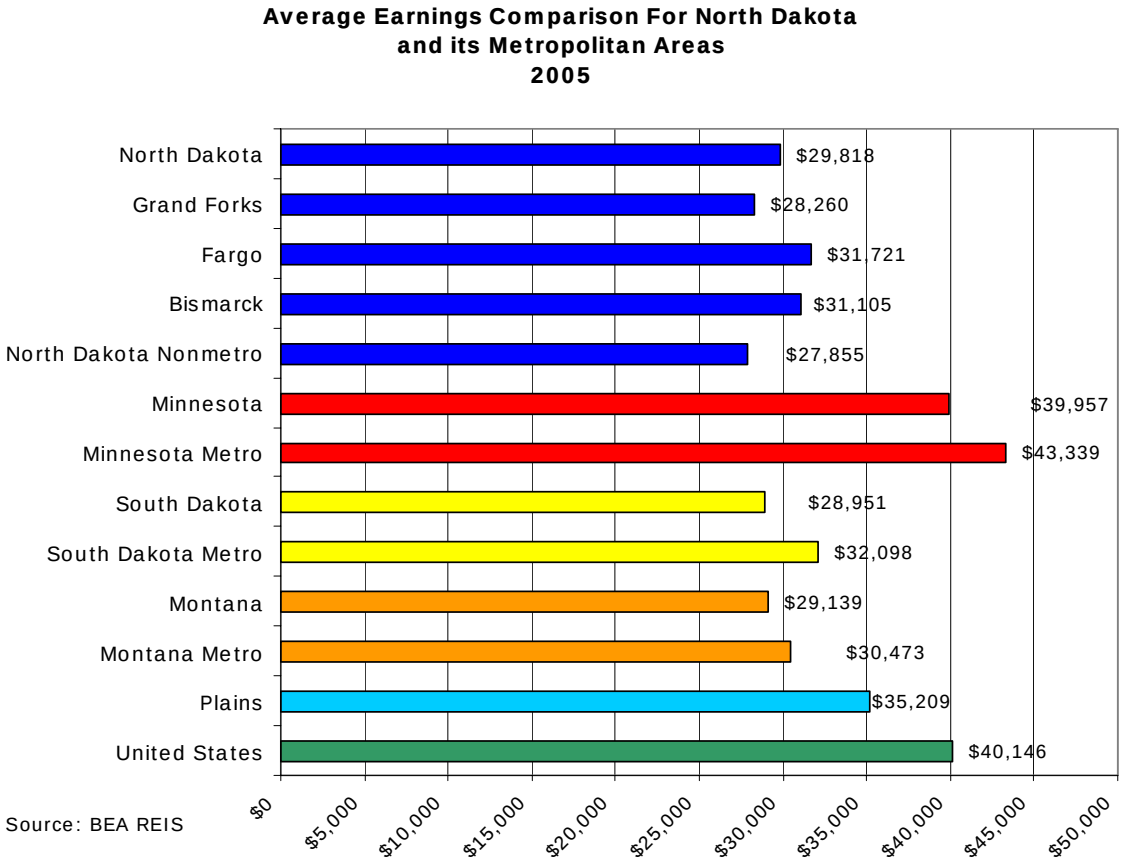
Earnings and regional competition

Money is a strong influence on the recruitment and retention of a highly talented workforce. All other things being equal,[23] most workers will choose to locate in an area that provides the best compensation for their labor. Given the fact that many areas in North Dakota seem to be losing population, it would be informative to evaluate the competitive position of North Dakota's wages, compared to its surrounding area.

Below is a chart that compares the most recent data available on average annual earnings by workers in North Dakota, several of its metro areas, and its surrounding states, as well as the region and the United States.

[22] The complete set of Labor Availability Studies for each of the listed communities in North Dakota is available online at http://www.ndcommerce.com/wfd/labor-avail/index.html.

[23] That is to say, quality of life, family, and other factors are also important determinants of where someone lives and works, but absent these factors, a rational agent would be highly likely to select a location based on the most attractive compensation for his or her labor.



The comparisons of these various geographies present a layered picture of earnings in North Dakota, its metropolitan areas, and its surroundings. Specifically, the following observations can be made:

- The state of North Dakota overall compares relatively favorably with its neighbors to the west and south, narrowly exceeding overall earnings for Montana and South Dakota in 2005. All of these states, however, trail the average for all Plains states, and lag behind average earnings in Minnesota by a wide margin – Annual earnings in Minnesota outstrip the average for North Dakota by over $10,000.

- Within North Dakota itself, the average wage earner can expect more money in one of the state's three major metropolitan areas than in the nonmetro portions of the state. This difference is not exceptionally large, especially for Grand Forks, but could be a sufficient draw away from rural areas, depending on the mobility and lifestyle preferences of those currently living in the rural areas.

- Comparing metropolitan areas between states yields a similar picture to the overall state comparisons, and an even more dramatic challenge from Minnesota's major metropolitan areas.

- Again, Montana and South Dakota's metro areas do not present a very large difference from North Dakota's metros, with the possible exception of Grand Forks. The marginal wage gain to be realized from moving between North Dakota's cities and those of its eastern and southern neighbors would not appear to be a major draw.

- However, compared to nonmetro areas of North Dakota, even the prevailing wages of Montana and South Dakota's metros may seem attractive.

- The real contender in this comparison is Minnesota, whose average metro annual income exceeds Fargo's by over $11,000, North Dakota's by $13,000, and nonmetro North Dakota's by over $14,000. Much of this high average, which is the only figure on this comparison to exceed the United States annual average wage, is accounted for by the influence of exceptionally healthy averages in Minneapolis-St. Paul ($44,890) and Rochester ($40,683).

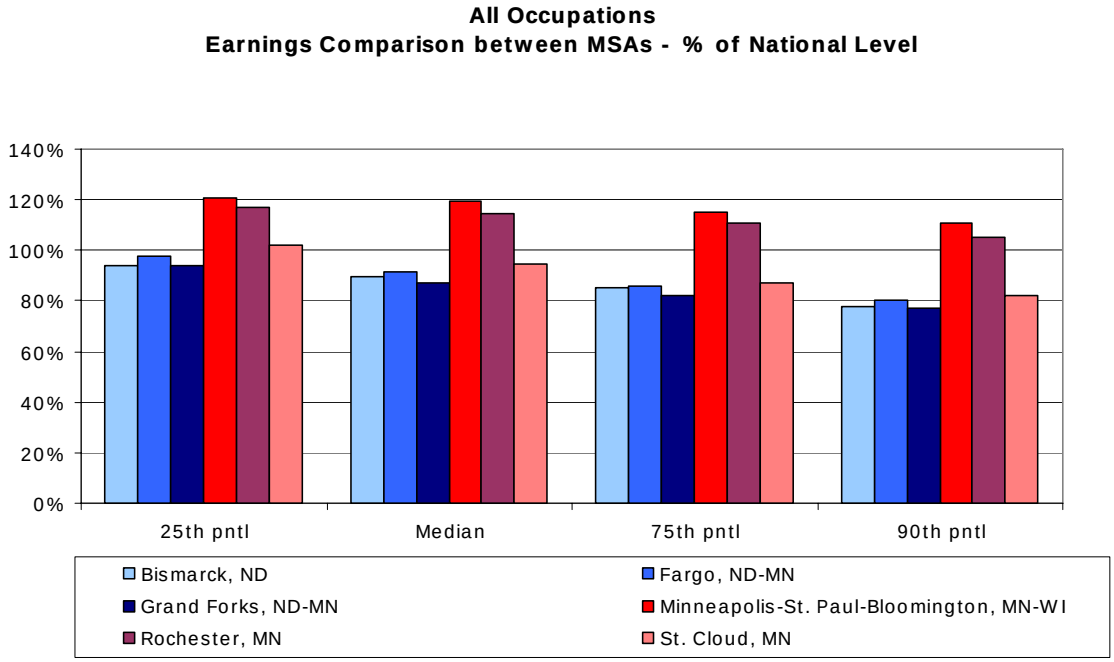
The high wage differential between some of Minnesota's metropolitan areas and North Dakota's metro and nonmetro areas makes the distance between North Dakota and Minneapolis or Rochester seem not so far to someone seeking high-wage opportunities. A detailed comparison of industry wages in certain key industries would most definitely yield a more varied picture, but the aggregate picture provides a very clear indication of the potential lure of high wages across the border, especially for people in areas like Grand Forks or Fargo, literally on the border to Minnesota.[24]

Comparisons by percentile earnings

Since mathematical averages are sensitive to the influences of extremes at the high and low ends, it is also useful to compare earnings by a method that is more stable, to see if the dramatic results remain. In this case, they do. The Bureau of Labor Statistics' OES (Occupational Employment Statistics) records provide earnings data by percentiles for all occupations. The median – 50th percentile – is the point above which exactly 50% of workers earn more, and 50% earn less. Through OES it is possible to look not only at medians, but also earnings at the 25th, 75th, and 90th percentiles, which is where one would more likely find, respectively, people early in their careers and workers with more experience, training, and expertise.

The following graph narrows the field of comparison to metro areas in North Dakota and Minnesota. As above, comparisons with metro areas in South Dakota and Montana did not yield earnings differentials with a significant enough contrast to present serious competition with employment in North Dakota MSAs. However, several key Minnesota MSAs still do exhibit major differences. The following earnings levels are indexed to those of the United States as a whole; i.e., these represent each MSA's percentage of the U.S. earnings levels.

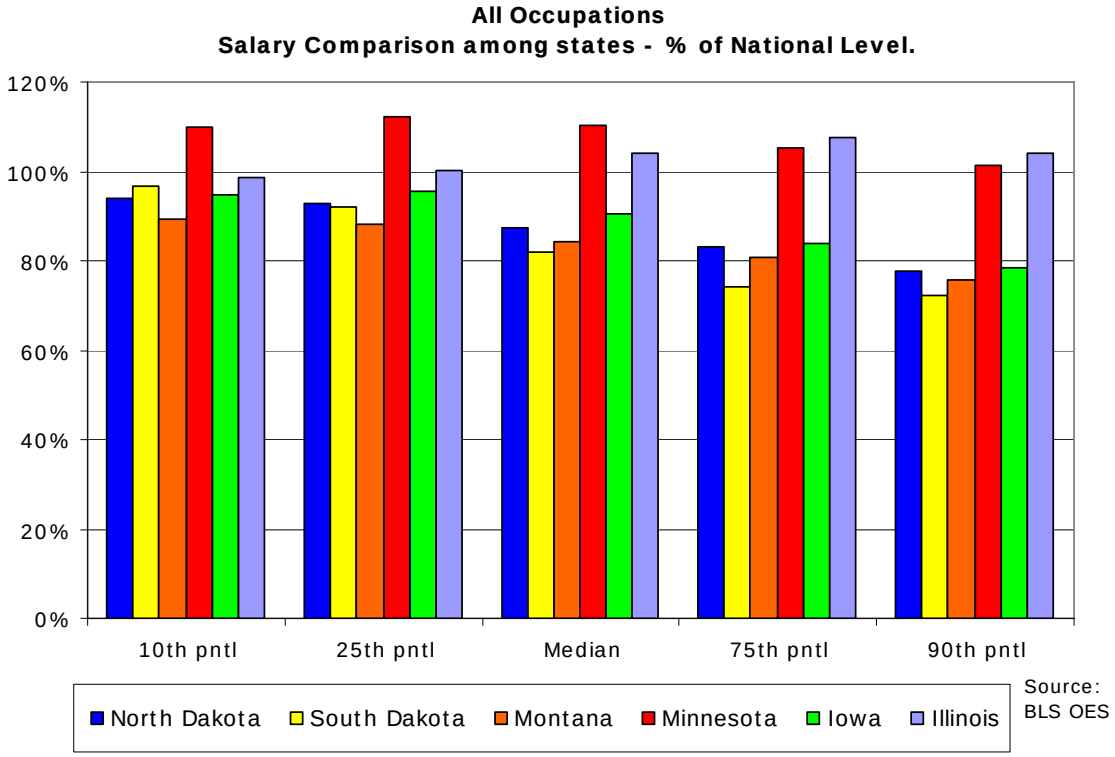
[24] It would be well to mention that, while wage differentials between North Dakota and other states might present certain kinds of challenges for workforce recruitment or retention, it may conversely be an advantage for attracting businesses sensitive to labor costs as part of their bottom line.



At each percentile, earnings from the three Minnesota MSAs presented here outstrip those of the three North Dakota cities – in the case of Minneapolis and Rochester, the margin grows as the statistics move up the pay scale. The difference between earning a salary that is 23% lower than the national 90th percentile and one that is 11% over is sufficiently clear to present a reason to pull up stakes and head east.

At the state level, the difference between the entire high Plains region and its eastern neighbors becomes clear. Comparing overall percentile earnings across states presents the picture seen below.

This graph shows us that North Dakota and its western and southern neighbors generally trail Midwestern states to the east in terms of earnings. Iowa's wages fluctuate more closely with the Plains, but there is no question that a worker's earnings potential in Minnesota, or farther afield in Illinois, exceeds what the same worker could aspire to in North or South Dakota, or Montana – again, by a widening margin at each successively higher step in the pay scale.



Workforce needs and prospects for growth: Industry sector profiles

Each of North Dakota's targeted industry sectors is accompanied by a list of member industries, as presented earlier in this report. To get closer to a picture of how North Dakota's workforce is prepared to meet the needs of each of these sectors, we turn to staffing patterns supplied by the Bureau of Labor Statistics in its employment matrices for 2004-2014 employment projections. The staffing patterns from each employment matrix tell us the relative importance of each occupation and occupational category to a particular industry, in terms of the percentage of total industry employment accounted for by each occupation.

Once we have used this measure to identify the vital occupations in each industry, we aggregate these to create a complete picture of employment across the entire sector. Based on this, we examine:

1. How these occupations are expected to fare according to North Dakota's official occupational projections;

2. The state's relative strength of employment in these occupations based on the employment location quotient (LQ); and

3. The prospects for employees in these occupational categories, based on current wages typical of the occupations in North Dakota.

Information Technology-Based Companies

North Dakota's IT sector faces certain misalignments between hopes for the future and present reality. Staffing patterns from the table below reveal that two of the most important employment categories to this sector, which together account for 28% of its employment, are in the fields of business and financial operations, and computer and mathematical occupations.

North Dakota Industry Cluster Workforce Profile
Information Technology

Occupational group	Staffing pattern	Occupation L.Q.	Total 2004-2014 Employm	Total Percent Change	Compensation vs. US 10th pntl	25th pntl	Median	75th pntl	90th pntl
All Occupations	**100%**	1.00	34,749	8.8%	94%	93%	87%	83%	78%
Office and administrative support occupations	**31%**	0.97	1,549	2.7%	94%	91%	85%	83%	84%
Business and financial operations occupations	**14%**	**0.75**	1,454	14.0%	90%	86%	82%	79%	76%
Computer and mathematical occupations	**14%**	**0.61**	1,267	25.4%	76%	72%	67%	66%	66%
Management occupations	**9%**	0.91	1,259	2.9%	94%	88%	81%	79%	
Sales and related occupations	**8%**	1.04	4,717	12.0%	90%	91%	85%	80%	72%
Arts, design, entertainment, sports, and media occupations	**6%**	0.91	282	5.8%	87%	76%	74%	68%	65%
Installation, maintenance, and repair occupations	**4%**	1.15	1,487	8.5%	99%	96%	95%	95%	95%
Architecture and engineering occupations	**2%**	0.81	760	15.7%	76%	75%	78%	79%	81%
Life, physical, and social science occupations	**2%**	0.88	245	8.0%	84%	79%	81%	78%	74%
Healthcare practitioners and technical occupations	**2%**	1.13	2,632	13.1%	96%	88%	84%	80%	75%
Transportation and material moving occupations	**2%**	1.08	2,188	8.1%	97%	101%	101%	99%	102%
Production occupations	**2%**	0.83	3,078	14.7%	104%	102%	100%	100%	92%
Personal care and service occupations	**1%**	**1.34**	1,343	8.2%	95%	96%	93%	89%	81%
Healthcare support occupations	**1%**	**1.31**	1,786	15.5%	103%	100%	94%	86%	81%
Legal occupations	**1%**	**0.57**	253	12.8%	86%	85%	76%	70%	
Food preparation and serving related occupations	**1%**	1.08	3,927	12.5%	95%	93%	94%	91%	86%
Building and grounds cleaning and maintenance occupations	**1%**	**1.20**	1,565	11.0%	92%	95%	93%	87%	83%
Education, training, and library occupations	**0%**	1.01	1,468	6.8%	109%	98%	87%	80%	75%
Protective service occupations	**0%**	**0.57**	284	4.9%	96%	101%	101%	89%	83%
Community and social services occupations	**0%**	1.09	559	8.6%	89%	92%	95%	89%	85%
Construction and extraction occupations	**0%**	1.16	2,783	13.2%	102%	97%	89%	84%	84%
Farming, fishing, and forestry occupations	**0%**	1.00	(137)	-1.2%	106%	118%	127%	114%	102%

Sources: BLS OES, Job Service North Dakota. Analysis by Workforce Associates, Inc.

Location quotients for these two occupations indicate that North Dakota had a relatively limited supply of workers in these occupations in 2004. An LQ of 0.61 in computer and mathematical occupations is especially low. Meanwhile, official state projections expect a 25.4% rise in employment in this category between 2004 and 2014, which amounts to 1,267 workers.

The retention data provided by the North Dakota University system for 2004 graduates indicate that North Dakota retained 73 of 115 people who earned diplomas in computer and information services fields, and just 15 of 41 with degrees in mathematics and statistics. Assuming a consistent level of production and retention at these rates – that is, that numbers of graduates in these fields remain constant and no additional people leave – this would put about 880 people into the labor pipeline for IT between 2004 and 2014. The potential shortage even in this one crucial occupational category is cause for concern.

Unfavorable compensation comparisons may be one reason for the loss of workers in these categories is also apparent. Examining wages at every level for business/financial operations and computer/mathematical occupations, we find that North Dakota's prevailing wages for jobs in these areas are significantly below national levels. At the median, workers in computer and mathematical occupations in North Dakota earn just two thirds of the U.S. median, and by the 90th percentile – where one generally finds the most highly skilled and experienced employees –

workers in business and financial operations are earning about three quarters of their counterparts nationwide.

If North Dakota is to recruit and retain enough highly capable people to fuel its IT sector's growth it seems very likely that compensation will need to become more attractive relative to what it is in other areas of the nation…not least of all in Minnesota.

Advanced Manufacturing

North Dakota Industry Cluster Workforce Profile
Advanced Manufacturing

Occupational group	Staffing pattern	Occupation L.Q.	Total 2004-2014 Employm	Total Percent Change	Compensation vs. US				
					10th pntl	25th pntl	Median	75th pntl	90th pntl
All Occupations	**100.0%**	1.00	34,749	8.8%	94%	93%	87%	83%	78%
Production occupations	**51.6%**	0.83	3,078	14.7%	104%	102%	100%	100%	92%
Office and administrative support occupations	**9.8%**	0.97	1,549	2.7%	94%	91%	85%	83%	84%
Architecture and engineering occupations	**5.7%**	0.81	760	15.7%	76%	75%	78%	79%	81%
Management occupations	**5.2%**	0.91	1,259	2.9%	94%	88%	81%	79%	
Installation, maintenance, and repair occupations	**5.1%**	1.15	1,487	8.5%	99%	96%	95%	95%	95%
Business and financial operations occupations	**3.0%**	**0.75**	1,454	14.0%	90%	86%	82%	79%	76%
Sales and related occupations	**2.9%**	1.04	4,717	12.0%	90%	91%	85%	80%	72%
Computer and mathematical occupations	**2.0%**	**0.61**	1,267	25.4%	76%	72%	67%	66%	66%
Construction and extraction occupations	**1.9%**	1.16	2,783	13.2%	102%	97%	89%	84%	84%
Transportation and material moving occupations	**2%**	1.08	2188	8.1%	97%	101%	101%	99%	102%
Life, physical, and social science occupations	**1.1%**	0.88	245	8.0%	84%	79%	81%	78%	74%
Building and grounds cleaning and maintenance occupations	**0.7%**	**1.20**	1,565	11.0%	92%	95%	93%	87%	83%
Arts, design, entertainment, sports, and media occupations	**0.5%**	0.91	282	5.8%	87%	76%	74%	68%	65%
Food preparation and serving related occupations	**0.3%**	1.08	3,927	12.5%	95%	93%	94%	91%	86%
Farming, fishing, and forestry occupations	**0.2%**	1.00	(137)	-1.2%	106%	118%	127%	114%	102%
Protective service occupations	**0.1%**	**0.57**	284	4.9%	96%	101%	101%	89%	83%
Healthcare practitioners and technical occupations	**0.1%**	1.13	2,632	13.1%	96%	88%	84%	80%	75%
Legal occupations	**0.0%**	**0.57**	253	12.8%	86%	85%	76%	70%	
Healthcare support occupations	**0.0%**	**1.31**	1,786	15.5%	103%	100%	94%	86%	81%
Education, training, and library occupations	**0.0%**	1.01	1,468	6.8%	109%	98%	87%	80%	75%
Personal care and service occupations	**0.0%**	**1.34**	1,343	8.2%	95%	96%	93%	89%	81%
Community and social services occupations	**0.0%**	1.09	559	8.6%	89%	92%	95%	89%	85%

Sources: BLS OES, Job Service North Dakota. Analysis by Workforce Associates, Inc.

As noted before, there are several relatively low-productivity industries in the Advanced Manufacturing sector as currently defined, and as such, they employ a large number of production workers – these account for over 51.6% of the staffing pattern in this sector. North Dakota's relative concentration of these kinds of workers trails the United States slightly, as evidenced by an occupational LQ of 0.83. Still, official state projections expect a demand for 3,078 additional workers in this sector by 2014, which will have to be met or exceeded in order for this sector to thrive.

Fortunately for this sector, wages for production occupations in North Dakota are competitive with the United States, equaling or exceeding prevailing national wages at all percentiles but the 90th, at which a level of 92% is still comparatively acceptable. These may or may not be lucrative enough to lure workers to manufacturing occupations in North Dakota from out of state, but could be sufficient to attract and retain in-state workers in these occupations.

Energy

The top four occupations in the Energy sector account for 68.5% of the sector's total workforce, and include production; construction and extraction; installation, maintenance, and repair; and

office and administrative support. In the top three of these, entry level wages are on par with the nation, and the state's relative concentration of these workers is similarly on par, or slightly lower. Earnings for construction and extraction occupations, however, slip with respect to their national counterparts at the median and in higher percentiles. Nonetheless, the state projects strong growth by 2014 – 7,348 additional workers in total.

North Dakota Industry Cluster Workforce Profile
Energy

Occupational group	Staffing pattern	Occupation L.Q.	Total 2004-2014 Employment Change	Total Percent Change	Compensation vs. US				
					10th pntl	25th pntl	Median	75th pntl	90th pntl
All Occupations	**100.0%**	1.00	34,749	8.8%	94%	93%	87%	83%	78%
Production occupations	**17.6%**	0.83	3,078	14.7%	104%	102%	100%	100%	92%
Construction and extraction occupations	**17.0%**	1.16	2,783	13.2%	102%	97%	89%	84%	84%
Installation, maintenance, and repair occupations	**16.1%**	1.15	1,487	8.5%	99%	96%	95%	95%	95%
Office and administrative support occupations	**15.1%**	0.97	1,549	2.7%	94%	91%	85%	83%	84%
Transportation and material moving occupations	**8.6%**	1.08	2,188	8.1%	97%	101%	101%	99%	102%
Architecture and engineering occupations	**6.5%**	0.81	760	15.7%	76%	75%	78%	79%	81%
Management occupations	**5.8%**	0.91	1,259	2.9%	94%	88%	81%	79%	
Business and financial operations occupations	**4.9%**	**0.75**	1,454	14.0%	90%	86%	82%	79%	76%
Life, physical, and social science occupations	**3.0%**	0.88	245	8.0%	84%	79%	81%	78%	74%
Computer and mathematical occupations	**2.1%**	**0.61**	1,267	25.4%	76%	72%	67%	66%	66%
Sales and related occupations	**1.5%**	1.04	4,717	12.0%	90%	91%	85%	80%	72%
Building and grounds cleaning and maintenance occupations	**0.4%**	**1.20**	1,565	11.0%	92%	95%	93%	87%	83%
Protective service occupations	**0.4%**	**0.57**	284	4.9%	96%	101%	101%	89%	83%
Legal occupations	**0.3%**	**0.57**	253	12.8%	86%	85%	76%	70%	
Healthcare practitioners and technical occupations	**0.3%**	1.13	2,632	13.1%	96%	88%	84%	80%	75%
Arts, design, entertainment, sports, and media occupations	**0.2%**	0.91	282	5.8%	87%	76%	74%	68%	65%
Farming, fishing, and forestry occupations	**0.1%**	1.00	(137)	-1.2%	106%	118%	127%	114%	102%
Food preparation and serving related occupations	**0.0%**	1.08	3,927	12.5%	95%	93%	94%	91%	86%
Healthcare support occupations	**0.0%**	**1.31**	1,786	15.5%	103%	100%	94%	86%	81%
Education, training, and library occupations	**0.0%**	1.01	1,468	6.8%	109%	98%	87%	80%	75%
Community and social services occupations	**0.0%**	1.09	559	8.6%	89%	92%	95%	89%	85%
Personal care and service occupations	**0.0%**	**1.34**	1,343	8.2%	95%	96%	93%	89%	81%

Sources: BLS OES, Job Service North Dakota. Analysis by Workforce Associates, Inc.

The only one of these occupations in which North Dakota appears to have a significant LQ disadvantage is office and administrative support, in which earnings at higher percentile levels become less competitive with the national level, but which is also projected to grow by 2.7% - an additional 1,549 workers – by 2014.

Perhaps the greatest area of concern for the Energy sector is the competitive, highly skilled architecture and engineering occupations, which account for 6.5% of the sector's current workforce and will be crucial to the sector's continuing evolution. North Dakota's concentration in these occupations is low, and earnings levels for these highly skilled individuals in North Dakota stand at 75-80% of the national levels.[25] Projections of 2014 employment in Energy call for 34,749 additional jobs across all occupational categories. An independent 2005 study of the petroleum industry in North Dakota indicated a demand for 2,700-3,000 new employees every year in petroleum alone.

Historically, operations in the oil and gas industries have often been located in environments considerably less hospitable than North Dakota. Still, they usually have been able to meet their workforce needs through salary and other incentives. Oil and gas companies and those companies that supply them have built workforces for operations in the most extreme

[25] It is worth noting that lower prevailing wages in an area can be attractive to budget-minded businesses, and have been a successful selling point in the past for business site selectors.

circumstances worldwide. By contrast, the western reaches of North Dakota seem relatively unchallenging. Of course, to the extent that there are energy companies operating on a thin margin in North Dakota, these may face more difficulty in paying what would be necessary to attract the needed workforce.

Value Added Agriculture

There is good news for the hopes of Value Added Agriculture in North Dakota. The numbers add up to a picture that looks safe and promising for growth in this sector. Value Added Ag is probably the best-positioned – in workforce terms – in the North Dakota economy to make real advances.

North Dakota Industry Cluster Workforce Profile

Value-Added Agriculture

Occupational group	Staffing pattern	Occupation L.Q.	Total 2004-2014 Employm	Total Percent Change	Compensation vs. US				
					10th pntl	25th pntl	Median	75th pntl	90th pntl
All Occupations	**100.0%**	1.00	34,749	8.8%	94%	93%	87%	83%	78%
Production occupations	**41.1%**	0.83	3,078	14.7%	104%	102%	100%	100%	92%
Transportation and material moving occupations	**15.5%**	1.08	2188	8.1%	97%	101%	101%	99%	102%
Farming, fishing, and forestry occupations	**13.1%**	1.00	(137)	-1.2%	106%	118%	127%	114%	102%
Management occupations	**7.8%**	0.91	1,259	2.9%	94%	88%	81%	79%	
Office and administrative support occupations	**6.6%**	0.97	1,549	2.7%	94%	91%	85%	83%	84%
Installation, maintenance, and repair occupations	**5.2%**	1.15	1,487	8.5%	99%	96%	95%	95%	95%
Sales and related occupations	**3.0%**	1.04	4,717	12.0%	90%	91%	85%	80%	72%
Food preparation and serving related occupations	**1.6%**	1.08	3,927	12.5%	95%	93%	94%	91%	86%
Building and grounds cleaning and maintenance occupations	**1.6%**	**1.20**	1,565	11.0%	92%	95%	93%	87%	83%
Business and financial operations occupations	**1.2%**	**0.75**	1,454	14.0%	90%	86%	82%	79%	76%
Life, physical, and social science occupations	**1.1%**	0.88	245	8.0%	84%	79%	81%	78%	74%
Architecture and engineering occupations	**0.7%**	0.81	760	15.7%	76%	75%	78%	79%	81%
Personal care and service occupations	**0.5%**	**1.34**	1,343	8.2%	95%	96%	93%	89%	81%
Construction and extraction occupations	**0.4%**	1.16	2,783	13.2%	102%	97%	89%	84%	84%
Computer and mathematical occupations	**0.3%**	**0.61**	1,267	25.4%	76%	72%	67%	66%	66%
Protective service occupations	**0.2%**	**0.57**	284	4.9%	96%	101%	101%	89%	83%
Healthcare practitioners and technical occupations	**0.1%**	1.13	2,632	13.1%	96%	88%	84%	80%	75%
Arts, design, entertainment, sports, and media occupations	**0.1%**	0.91	282	5.8%	87%	76%	74%	68%	65%
Legal occupations	**0.0%**	**0.57**	253	12.8%	86%	85%	76%	70%	
Education, training, and library occupations	**0.0%**	1.01	1,468	6.8%	109%	98%	87%	80%	75%
Community and social services occupations	**0.0%**	1.09	559	8.6%	89%	92%	95%	89%	85%
Healthcare support occupations	**0.0%**	**1.31**	1,786	15.5%	103%	100%	94%	86%	81%

Sources: BLS OES, Job Service North Dakota. Analysis by Workforce Associates, Inc.

Among the top three occupations in terms of employment in this sector – production occupations; transportation; and of course farming, fishing, and forestry – all are competitive with national wages, and LQs at least do not suggest competitive disadvantage. Transportation, in particular, provides earnings opportunities that are roughly equal to or greater than the wages earned at the national level, at all percentiles of the earnings scale.

Official state projections expect employment in farming, fishing, and forestry by itself to decline by 137 persons by 2014, but the fortunes of Value Added Agriculture might change this. Also, those presently employed strictly in agricultural operations may find new employment within some of the more advanced entrepreneurial ventures within the sector – in management, production, or career fields that have not yet been classified.

Tourism

The eclectic mix of industries in this sector makes it somewhat difficult to discern intuitively what occupational demand may exist for the sector overall, so staffing patterns – which aggregate the complete set of industries – help to clarify the potential demand picture.

The results of this staffing pattern analysis do mostly make intuitive sense, though. The largest shares in tourism end up in the occupational sectors of transportation, sales, and office support – together these account for more than two thirds of Tourism's workforce. Surprisingly, personal service occupations do not take up as much of the sector as might be expected, but they still account for 7.4% of all employment in Tourism.

North Dakota Industry Cluster Workforce Profile

Tourism

Occupational group	Staffing pattern	Occupation L.Q.	Total 2004-2014 Employm	Total Percent Change	Compensation vs. US				
					10th pntl	25th pntl	Median	75th pntl	90th pntl
All Occupations	**100.0%**	1.00	34,749	8.8%	94%	93%	87%	83%	78%
Transportation and material moving occupations	**24.3%**	1.08	2,188	8.1%	97%	101%	101%	99%	102%
Sales and related occupations	**22.3%**	1.04	4,717	12.0%	90%	91%	85%	80%	72%
Office and administrative support occupations	**20.8%**	0.97	1,549	2.7%	94%	91%	85%	83%	84%
Installation, maintenance, and repair occupations	**8.8%**	1.15	1,487	8.5%	99%	96%	95%	95%	95%
Personal care and service occupations	**7.4%**	**1.34**	1,343	8.2%	95%	96%	93%	89%	81%
Management occupations	**3.4%**	0.91	1,259	2.9%	94%	88%	81%	79%	
Production occupations	**2.8%**	0.83	3,078	14.7%	104%	102%	100%	100%	92%
Business and financial operations occupations	**1.9%**	**0.75**	1,454	14.0%	90%	86%	82%	79%	76%
Healthcare practitioners and technical occupations	**1.9%**	1.13	2,632	13.1%	96%	88%	84%	80%	75%
Arts, design, entertainment, sports, and media occupations	**1.2%**	0.91	282	5.8%	87%	76%	74%	68%	65%
Healthcare support occupations	**1.1%**	**1.31**	1,786	15.5%	103%	100%	94%	86%	81%
Farming, fishing, and forestry occupations	**1.1%**	1.00	(137)	-1.2%	106%	118%	127%	114%	102%
Computer and mathematical occupations	**0.7%**	**0.61**	1,267	25.4%	76%	72%	67%	66%	66%
Building and grounds cleaning and maintenance occupations	**0.5%**	**1.20**	1,565	11.0%	92%	95%	93%	87%	83%
Life, physical, and social science occupations	**0.5%**	0.88	245	8.0%	84%	79%	81%	78%	74%
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Community and social services occupations	**0.0%**	1.09	559	8.6%	89%	92%	95%	89%	85%

Sources: BLS OES, Job Service North Dakota. Analysis by Workforce Associates, Inc.

Among the occupations that we have not yet examined in this report but figure heavily into the Tourism sector are sales occupations. These naturally include retail and wholesale, already large components of the North Dakota workforce, and are projected to provide another 4,717 job openings by 2014. Relative compensation levels beyond the median for the sales occupational group do not look especially attractive, but they are reasonably competitive at the entry level. Since jobs in sales tend to be weighted toward lower pay scales, and heavy on entry level positions, this may not present much of a challenge for growth.

Health Services

The Center for Rural Health at the University of North Dakota has conducted a great deal of research to track the needs of the health care workforce in North Dakota – particularly in rural areas, of course. A set of policy briefs created by the Center for Rural Health paints a picture of

current and/or impending shortages of crucial health care professionals in North Dakota. According to these policy briefs:

- Significant percentages of North Dakota's counties are currently designated as federal professional shortage areas, including
    - 81% of North Dakota counties for primary care.
    - One third of counties for oral health.
    - 94% of counties for mental health.
- 26% of the state's physicians and 24% of the state's nurses expect to retire by 2015, which will create high demand for replacements.
- Rural health providers express difficulty maintaining adequate numbers of a variety of health professionals, including clinical technicians and emergency medical service providers.

The Center for Rural Health has also conducted interviews and surveys to gauge the educational pipeline and its potential to fulfill the state's health workforce needs. These explorations have uncovered information about:

- **Medical students.** Among first year medical students and residents in North Dakota in 2005, 40% indicated that they would stay in the state to practice. Of those choosing to stay, 18% indicated a desire to work in a rural area of North Dakota.
    - Those choosing to stay cited quality of life, availability of good educational programs, and their spouse/significant other's employment in the state as reasons to remain in North Dakota.
    - Those who intend to leave cite more critical and acute cases available elsewhere, more job opportunities, and greater cultural diversity and/or better working conditions as factors contributing to their intended departure.
    - Among those who did not plan to work in rural areas, older technology, unfamiliarity with rural communities, and scarce job opportunities for spouses and significant others were listed as motivating factors.
- **Nursing students.** Among nursing students surveyed in 2004, 36% indicated a desire to work in an urban area in North Dakota, and an additional 20% intended to work in rural or semi-rural areas of the state. Together this means that over half of nursing students overall intend to remain in the state.

- Family is again among reasons given for working in North Dakota, and spousal employment and close relationships with patients were cited in particular as reasons for working in rural areas.

- Those desiring to leave the state indicated pay, benefits, and job opportunities as motivators of their decision. Also, some simply wanted a different experience from rural environments in which they had been raised.

North Dakota's important Health Services sector faces some challenges for the successful maintenance and expansion of its workforce in coming years, according to these reports. Not only does a health care support structure benefit the state and its communities in terms of basic well-being, but as the Center for Rural Health's policy briefs point out, health providers are also important to economic development, as the availability of health services is vital for the hopes of businesses starting, expanding, and/or locating within North Dakota's communities.

The Center for Rural Health also includes recommendations for action to remedy shortages and bolster supply of health professionals, some of which will be addressed later in this report.

General Conclusions on the State of the 2007 North Dakota Workforce

The analysis presented in this reports lends itself to the following general conclusions about the state of the North Dakota workforce in 2007.

- Demographically, North Dakota faces significant challenges. It is safe to say that the most important challenge to the future of the North Dakota workforce is one of quantity – as young people leave the state and many in the existing population age, will North Dakota have enough people to fill jobs and create economic growth?

- North Dakota's target industry sectors are well selected to take advantage of areas where the state has existing economic strengths, and to capitalize on the future development of those industry sectors.

- The current North Dakota workforce is balanced to provide a good mix of skills for more traditional kinds of industry, but exhibits relatively low concentrations of some occupations and occupational groups that will be needed to drive the further evolution of high technology within target industry sectors.

- Earnings comparisons between North Dakota and some surrounding areas – especially several of Minnesota's metro areas – shows good competitive strength for many professions within the state's target industry clusters. Wage and salary competition for some high technology occupations, however, especially in the Information Technology sector, might provide challenges for recruitment from other areas, and perhaps for

retention of top talent, depending on the mobility and lifestyle preferences of highly talented high technology workers.

- North Dakota's educational system at all levels shows exemplary performance. The state must find ways to capitalize on the high quality of its talent development pipeline by finding ways to get young people to stay in North Dakota as productive parts of its 21st century workforce.

Supporting the North Dakota Talent Initiative: Best Practices for Strategic Action

This section presents some ideas that have emerged from the research and experience of Workforce Associates, Inc. that represent best practices relative to the "three pillars" of the North Dakota Talent Initiative – that is, Talent Attraction, Talent Retention, and Talent Expansion. This list is not meant to be an exhaustive or comprehensive list of all strategies and tactics that may represent best practices for these goals, nor does it attempt a full evaluation of every project or initiative that North Dakota has undertaken, or plans to undertake, with respect to these issues. (Both of those would properly belong to another kind of study altogether.) Rather, it is a selected list, included to inspire ideas and spark discussion of creative solutions to North Dakota's workforce challenges.

Talent Attraction (Recruitment)

We have seen in this report the challenges that North Dakota's workforce development faces because of the demographic trends of its population and labor force. These trends make recruitment the highest priority for the growth and success of the 21st century workforce of North Dakota. North Dakota needs not only to open its doors wide, but also to draw a large number of the most talented workers through those doors. This will take a prominent and active effort to capture new imports and reclaim some of those who have left North Dakota to seek opportunities elsewhere.

A model: Iowa's "Smart Career Move"

For a highly relevant model of talent recruitment in a largely rural state, North Dakota could look to the Iowa Career consortium and its ongoing project, "Smart Career Move." This project's main feature is a Web site, www.smartcareermove.com. This site is a tightly branded Web portal for all aspects of employment and residence in Iowa, designed to recruit out-of-state workers to Iowa, and to recapture Iowans who have left for other states. While tied to Iowa's state Web sites and resources, the address is deliberately free of the word "Iowa" or any designators that it is a government site, choosing first to emphasize the central idea of the "smart career move" that awaits workers willing to relocate to Iowa.

The site itself contains job listings, multimedia content (including streaming video), information for employers, networking resources for young workers in Iowa, internships and other student

opportunities, and a framework that allows access to the complete set of resources of Iowa's state government Web site. These are all tied to an aggressive and ambitious advertising campaign, which capitalizes on Iowa's quality of life as its key selling point, contrasting Iowa life with the stress, danger, pollution, and other drawbacks to living in major urban areas. (A sample tag line reads: "No traffic jams. Great schools. Safe communities. You'll get used to it.") In this respect, North Dakota's positive attributes are very similar to those touted by Iowa's campaign, and could provide excellent leverage for a comparable effort.

The "Smart Career Move" effort began in 1998 as an effort by Iowa's governor to reverse an exodus of Iowans from the state. Meanwhile, the Iowa Career Consortium's presence is not simply limited to advertising and the Web. The ICC is an active partner in Iowa's workforce development. Some of ICC's other strategic and tactical activities include the following:[26]

- The Iowa Career Consortium maintains a network of over 80 major employers in, who meet quarterly to discuss brain gain issues, HR trends, employment, and salary information. There are also educational meetings where employers learn about the global competitive environment in which they have to work. Creative benefits such as adult care, job sharing, telecommuting, time off for distance learning, defined career pathways, etc. are topics that are discussed in detail.

- The Consortium contributes job openings to the Iowa workforce system that start at $30,000 per year. There has been some recent discussion about changing this system to include more than one level, advertising entry level jobs at $30 – 45,000 and mid- and senior-level jobs at $46,000-$250,000 to attract more possible candidates to the state.

- The Consortium works closely with the state universities to participate at their alumni receptions to find out names of Iowa graduates who have left the state. More than 8,400 alums receive quarterly email newsletters, which inform about and advertise the Iowa economy and new job openings.

- The Consortium also participates at national career fairs that target advanced manufacturing, engineering, finance, and other fields that provide lucrative job opportunities in Iowa. Consortium members promote www.smartcareermove.com at these booths.

- In addition, employers who are members of ICC reach into Iowa middle and high schools with mentoring programs, paid internships, and active participation in pipeline programs for technology and engineering careers like the FIRST Lego League, FIRST Robotics, and Project Lead the Way. (See below in the "Talent Expansion" section for more on these.)

There has been no scientific study of the effect of the Smart Career Move campaign on recruitment (and re-recruitment) of talent to Iowa. The program, now in its 9th year, officially reports that as of December 2005, the Web site and Smart Career Move campaign could be

[26] Some of this information was obtained via telephone interview by Jane M. Lommel of Workforce Associates, Inc.

credited with the recruitment or return of 2,500 individuals to Iowa. Without a thorough study, it is difficult to corroborate this number. Nonetheless, testimonials published on www.smartcareermove.com speak to the influence of the program on the importation or reclamation of some of this workforce talent, and the program constitutes a strongly promising practice.

Opportunities, Promising Practices, and Projects within North Dakota

The elements of a unified recruitment effort are present, at least in part, in projects already being undertaken in North Dakota, and also in a number of opportunities to capitalize on good news about the state. Some of these elements include:

- **North Dakota Young Professionals networks.** There is a central Web site for the YP networks in several North Dakota cities at www.ndyp.net. Each of these networks is dedicated to fostering the growth and interaction of the business communities in their cities. By themselves, these groups deserve mention already as a good strategy for retention of young talent in North Dakota. These groups are mentioned here, because, taken to the next logical step, these YP networks could also play a part in recruiting young professionals to North Dakota. There could be few better salespeople for the state and its communities than those who are networking and achieving success in North Dakota already. The statewide Web site already provides a forum for cooperation of these organizations. The conceptual infrastructure is already in place, and the opportunity to capitalize on these groups is clear.

- **North Dakota's own state government Web sites.** Many of the pages accessible through the www.nd.gov portal are well-organized and provide links to highly useful information about employment and business within North Dakota. Again, the infrastructure is present for a strong Web presence for those seeking information about the opportunities that North Dakota has to offer. Taking cues from both the "Smart Career Move" model and North Dakota's own "Legendary" tourism promotion, this resource could be harnessed as the backbone of a strongly branded, aggressive multimedia marketing and recruitment effort.

- **Plenty to sell.** North Dakota also does not have to look very far to provide effective selling points for a recruitment campaign. Various official sources are independently reporting on their own favorable rankings, evaluations, and statistical bragging rights. Some of these have been addressed in this report. In sum, these selling points could add up to a strong pitch. A small sampling of these includes:

    - **A "#8" ranking** for the University of North Dakota among the Entrepreneur magazine/Princeton Review list of the best undergraduate schools for entrepreneurship in the U.S. (Reported on UND's Center for Innovation Web site.)

- **A string of kudos for Bismarck-Mandan**, including being named the #1 least stressful city in America, and #11 in an *Inc.* magazine list of "best places for business." (Reported by the Bismarck-Mandan Chamber of Commerce.)

- **Forbes magazine rankings of #3 and #4**, respectively, for Fargo and Bismarck in their list of the best small metros for business in America.

Talent Retention

By far the most dramatic result of this report's research is the revelation of the speed and volume of young talent leaving the state of North Dakota. What are some of the best ways that North Dakota might combat this loss of talent? Again, a mix of ideas both independent and already present in North Dakota presents itself.

Tuition Forgiveness/Loan Repayment

The concept of offering some kind of reimbursement of tuition and/or student loans to graduates of higher education as an incentive to keep them living and working in North Dakota in critical occupations is one that has been applied and tried throughout the country. Indeed, North Dakota now has at least one loan forgiveness program in place, to compensate teachers who stay to work in North Dakota at grade levels or subject areas currently deemed to be in shortage.[27]

The Center for Rural Health, in its 2007 policy briefs, suggests the creation and support of similar loan forgiveness programs for high-demand health professions, including nursing, allied health, and dental assistants. To the east, Minnesota has a range of similar programs in place for health professions.[28] Amy Vallery of the Minnesota Department of Health reported to Workforce Associates, Inc.[29] that these loan forgiveness programs are not even limited to graduates of Minnesota institutions – so they are a recruitment tool as well as a retention strategy. In fact, "a fair number of applications" for the health care loan forgiveness programs in Minnesota come from North Dakota, according to Ms. Vallery.

Tuition forgiveness could be explored as an incentive for critical occupations in other fields within North Dakota's target industries as well. These can be tricky politically in some regards. People already working in fields for which loan forgiveness programs are introduced might feel shortchanged and offer opposition – in much the same way that existing businesses in an area might resist an economic development tax incentive to recruit or retain new businesses, particularly competitors.

On the other hand, these programs have been tried for many years now in other states and regions, and have a long track record. Those who have created and used such programs in other

[27] See http://www.ndus.nodak.edu/students/financial-aid/details.asp?id=430.
[28] For an indication of the scope and variety of these programs in Minnesota, see http://www.health.state.mn.us/divs/orhpc/funding/loans/index.html.
[29] Telephone contact with Richard W. Judy, Sept. 24, 2007.

states can provide valuable experience, whether through formal evaluations or anecdotal advice. Several resources exist to find out more about other states' programs for tuition/loan forgiveness. Included among those are the following:

- State Higher Education Executive Officers (SHEEO) features a cursory list of states with tuition and loan forgiveness, rebates, and similar incentives or programs at http://sheeo.org/Finance/t&f_web/Section%20B-8.pdf.

- The American Federation of Teachers (AFT) offers a comprehensive list of loan forgiveness programs by state, specific to the teaching profession, which may be found here: http://www.aft.org/teachers/jft/loanforgiveness.htm

- Evaluations are available online for some loan forgiveness programs, and can be instructive for gauging best practices and others to avoid.

    - A 2007 evaluation of Minnesota's program is available through the Web site of its office of Rural Health and Primary Care, in the Department of Health:

        - The executive summary may be viewed here: http://www.health.state.mn.us/divs/orhpc/pubs/loanforgexsum.pdf

        - The full study is nearby: http://www.health.state.mn.us/divs/orhpc/pubs/loanforgivreport.pdf

    - A pair of evaluations of New York efforts to offer tuition and loan forgiveness can be found online as well. These are older reports, but offer some perspective on the results of such programs. They can be found online at:

        - http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/29/ad/06.pdf ; and

        - http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/13/10/08.pdf.

Using college career counselors

North Dakota has within its colleges and universities a network of career counselors – the North Dakota Association of Career Services Professionals.[30] This group of higher education counselors exists to promote opportunities for businesses to recruit talent from the ranks of their institutions. This network of professionals could also play an important role for talent retention by promoting the advantages of staying and working for North Dakota businesses to the students they serve. It may even be worth exploring an incentive structure to reward counselors for successful retention of students for critical occupations in target industries.

[30] See http://www.ndacsp.nodak.edu/.

Internship opportunities

As with several other strategies, internships fall into at least two of the categories of the goals of the North Dakota Talent Initiative. Providing students with opportunities to explore North Dakota's businesses from the inside while still in school is a way of conditioning the "pipeline" of future workers for North Dakota businesses. However, since internships can increase the chances of a student seeking a position with a company after graduation, it is also an important tool for retention of talent.

North Dakota's Department of Commerce has understood this potential, and has just created a program to support internship opportunities within the state's target industry sectors, called "**Operation Intern**."[31] This program provides matching funds for employers within target industry sectors (whose member industries are defined above in this report) to create and support internships within their companies.

The "Operation Intern" program also makes use of a long-standing resource in North Dakota called "TeamND," described as a "single point of entry" online to link job seekers within North Dakota postsecondary institutions and the employers who seek candidates for internships and employment.

The most important feature of "Operation Intern," however, is its inclusion of performance and accountability metrics, which mandate the tracking of internship program participants to determine whether they are indeed retained in the businesses who provided the internship opportunity, in other businesses in target industries, or in North Dakota in general. This accountability is absolutely crucial to gauging the success of such an effort, and should be diligently applied.

Simultaneously, to help ensure the success of this promising program, every effort should be made to streamline the process of application, registration, and record-keeping for businesses and for the interns who participate in this program. One common complaint that employers around the country have voiced about some efforts sponsored by workforce agencies is that too much paperwork and red tape discourages their participation, even if potential monetary support is on the table. On the other hand, when programs have been presented to employers in convenient and relatively unrestricted ways, many communities have found that employers participate readily.

Talent Expansion

As mentioned before, in terms of the "pipeline" of future workers, North Dakota's educational system is already doing a good job getting students successfully through a K-12 education, and the system of higher education is strong enough to pull in talent from out of state, as well as

[31] See http://www.ndcommerce.com/wfd/wdc/Internship%20Work%20Experience%20Brochure%20Applicaiton%208-29-07.pdf.

serving its own residents. In terms of "best practices," many states would do well to study North Dakota as a model for creating educational success.

The challenge for talent expansion, then, is one that overlaps with retention. North Dakota must engage the maximum number of its students from its excellent school systems, so that when they emerge from the education pipeline, they are ready and willing to join the workforce of North Dakota's most vital industries. There are plentiful programs and initiatives around the country that provide these opportunities to capture and harness young people's interest in key industries. Some industries have seen more focus than others as industry organizations themselves and public economic and workforce agencies have fostered efforts to further the interests of their region's key economic players. A brief sampling of such ideas follows.

Manufacturing, Engineering, and Science/Technology fields

There is one strategy that North Dakota's Advanced Manufacturing and high technology firms could employ to increase the flow of graduates who have strong math, science, and engineering backgrounds. With mentoring by area engineers and employers, this strategy could have substantial long-term potential. This proven program, which already thrives in many high schools around the nation, is US FIRST Robotics. (www.usfirst.org)

FIRST (For Inspiration and Recognition of Science and Technology) is a multinational nonprofit organization, which aspires to transform culture; making science, math, engineering, and technology as rewarding, absorbing, and "cool" for high school students as sports are today. The key to FIRST's success is the work of over 25,000 volunteer mentors in leading companies, professional engineers, teachers, and other adults working with students across the country.

The FIRST Robotics competition, FIRST's flagship project, is a nationwide tournament which challenges teams of high school students and their mentors from their community's engineering, manufacturing, and technology firms to design, build, program, and operate a robot that will perform in a specialized sporting event. Competitions from the local to the national level pit these teams and their robots against each other, demanding teamwork, dedication, and above all, the development of real technical ingenuity.

FIRST Robotics has already proven successful in providing manufacturing and technology-oriented businesses – especially those who sponsor mentors – with some of the best and brightest young talent in the areas where the program is present. Students who participate in FIRST proceed into technology-related programs in their post-secondary education at much higher rates than their peers, and those who establish good relationships with the businesses who mentor them win internships and eventually employment with some of those firms.

The FIRST Robotics program is one that hundreds of school districts have already embraced, but none so far in North Dakota has started a team. Teams around the country are more than willing to share their experiences with a brand new team in North Dakota. The only impediment to implementing this solution's actions is possible indifference by adults and students to the merits

of this dynamic program – but once they see the exciting results of this program, such indifference is highly unlikely.

Another program that North Dakota's manufacturing employers would do well to explore is the **National Association of Manufacturers' "Dream It. Do It." Campaign**, designed to build career awareness about opportunities in manufacturing for young people. Its professional Web site and multimedia materials are designed to counter the widespread misconception by students, parents, and teachers that there is no future in manufacturing in the US. This program started as a pilot in Kansas City and will be rolled out to other cities during the coming year. The Web site http://www.dreamit-doit.com/campaign/ provides more information about becoming a participant in the nationwide campaign.

Health Services and related fields

The Center for Rural Health's April 2007 policy brief *North Dakota Health Care Workforce: Planning Together to Meet Future Health Care Needs*, by Amundson et. al., has already been mentioned in this report, and provides an excellent planning foundation for K-12 pipeline preparation for North Dakota's future Health Services workforce. A detailed plan is presented in this policy brief for pipeline preparation, and the following action steps from this plan are quoted directly from the brief:[32]

- Action Step 1: Develop curriculum plan and design a workshop to engage parents.
- Action Step 2: Develop programs that use existing community resources (e.g., health care employers who can provide information about what careers are needed in the area.)
- Action Step 3: Health care providers and/or academic departments could adopt a K-12 class as a community service project and provide tours, presentations, and related activities to introduce students to health care professions.
- Action Step 4: Schools, employers, and health care provide partners to develop a toolkit for elementary school students to reinforce reading, writing, math, and basic skills.
- Action Step 5: Given concern with the Health Insurance Portability and Accountability Act (HIPAA) and its impact on job shadowing, work with state boards and others to address regulatory requirements. Develop appropriate standards for different levels of students (e.g., fourth grade vs. high school student).
- Action Step 6: Examine the Grand Forks health career development model to determine applicability to rural areas. With assistance from the North Dakota Career Counselors Association, develop a pilot program.

Each of these steps is accompanied by specific descriptions of stakeholders and potential tactics for implementation in the full report. The policy brief also contains a matrix of workforce pipeline-related activities and issues as dealt with in other states, to provide additional references and resources for the ideas put forth as policy recommendations. It is highly recommended reading.

[32] Workforce Associates, Inc. obtained the full Center for Rural Health policy brief through the Center's Patricia Moulton, Ph.D, a co-author of the brief. For more information about the Center itself, including a wide range of research reports, see http://www.med.und.edu/depts/rural/.

Appendix – Complete Lists of High and Low Occupational Location Quotients for North Dakota

Occupations With High Occupational Location Quotients in North Dakota, 2006
& Median Annual Salary Comparisons **Page 1 of 3**

SOC	Occupational Title	Employment, May 2006		Occupational	Median Salary	
		Number	% of total	L.Q.	ND 2006	% of US
11-2011	Advertising and promotions managers	120	0.0%	**1.24**	$ 44,550	61%
11-3041	Compensation and benefits managers	170	0.1%	**1.44**	$ 57,820	77%
11-9039	Education administrators, all other	120	0.0%	**1.78**	$ 56,450	85%
11-9061	Funeral directors	100	0.0%	**1.73**	$ 60,650	122%
11-9081	Lodging managers	120	0.0%	**1.51**	$ 40,410	95%
11-9131	Postmasters and mail superintendents	330	0.1%	**4.90**	$ 45,600	82%
11-9151	Social and community service managers	430	0.1%	**1.51**	$ 48,170	93%
11-1011	Chief executives	950	0.3%	**1.25**	$ 123,290	0%
13-1021	Purchasing agents and buyers, farm products	220	0.1%	**6.63**	$ 53,010	113%
13-1061	Emergency management specialists	80	0.0%	**2.79**	$ 42,440	90%
13-2061	Financial examiners	80	0.0%	**1.29**	$ 66,390	102%
17-1021	Cartographers and photogrammetrists	520	0.2%	**17.97**	$ 28,330	59%
17-2021	Agricultural engineers	80	0.0%	**10.36**	$ 65,690	99%
17-3022	Civil engineering technicians	280	0.1%	**1.28**	$ 38,430	95%
17-3031	Surveying and mapping technicians	280	0.1%	**1.56**	$ 37,180	115%
19-1012	Food scientists and technologists	60	0.0%	**2.70**	$ 48,270	90%
19-1013	Soil and plant scientists	60	0.0%	**2.21**	$ 50,090	89%
19-1023	Zoologists and wildlife biologists	90	0.0%	**1.97**	$ 53,870	101%
19-1029	Biological scientists, all other	190	0.1%	**2.98**	$ 55,260	91%
19-1031	Conservation scientists	180	0.1%	**4.44**	$ 56,930	104%
19-2021	Atmospheric and space scientists	40	0.0%	**1.91**	$ 68,390	89%
19-3031	Clinical, counseling, and school psychologists	310	0.1%	**1.26**	$ 53,570	90%
19-4011	Agricultural and food science technicians	250	0.1%	**5.14**	$ 32,980	104%
19-4021	Biological technicians	360	0.1%	**1.99**	$ 26,510	74%
19-4093	Forest and conservation technicians	200	0.1%	**2.58**	$ 32,480	105%
21-1022	Medical and public health social workers	460	0.1%	**1.56**	$ 34,600	80%
21-1093	Social and human service assistants	1360	0.4%	**1.69**	$ 21,530	84%
23-1021	Administrative law judges, adjudicators, and heari	50	0.0%	**1.36**	$ 83,370	115%
23-2092	Law clerks	160	0.0%	**1.98**	$ 36,410	100%
25-1011	Business teachers, postsecondary	340	0.1%	**1.99**	$ 55,220	89%
25-1021	Computer science teachers, postsecondary	130	0.0%	**1.40**	$ 50,570	88%
25-1032	Engineering teachers, postsecondary	120	0.0%	**1.48**	$ 62,940	82%
25-1041	Agricultural sciences teachers, postsecondary	260	0.1%	**10.15**	$ 76,010	101%
25-1051	Atmospheric, earth, marine, and space sciences t	40	0.0%	**1.82**	$ 59,670	86%
25-1052	Chemistry teachers, postsecondary	80	0.0%	**1.62**	$ 52,360	86%
25-1067	Sociology teachers, postsecondary	60	0.0%	**1.47**	$ 51,800	91%
25-1072	Nursing instructors and teachers, postsecondary	250	0.1%	**2.51**	$ 45,040	81%
25-1081	Education teachers, postsecondary	240	0.1%	**1.77**	$ 50,370	95%
25-1112	Law teachers, postsecondary	50	0.0%	**1.66**	$ 64,060	73%
25-1113	Social work teachers, postsecondary	70	0.0%	**3.52**	$ 44,330	82%
25-1121	Art, drama, and music teachers, postsecondary	220	0.1%	**1.21**	$ 42,160	79%
25-1122	Communications teachers, postsecondary	120	0.0%	**2.01**	$ 49,230	93%
25-1123	English language and literature teachers, postsec	220	0.1%	**1.46**	$ 39,640	77%
25-1125	History teachers, postsecondary	70	0.0%	**1.32**	$ 47,060	82%
25-1191	Graduate teaching assistants	750	0.2%	**2.63**	$ 27,790	100%
25-1194	Vocational education teachers, postsecondary	360	0.1%	**1.30**	$ 40,080	91%
25-2021	Elementary school teachers, except special educ	5580	1.7%	**1.46**	$ 38,640	85%
25-2032	Vocational education teachers, secondary school	530	0.2%	**2.20**	$ 42,400	87%
25-2041	Special education teachers, preschool, kindergart	920	0.3%	**1.68**	$ 38,050	82%
25-4021	Librarians	520	0.2%	**1.38**	$ 39,400	80%
25-9021	Farm and home management advisors	170	0.1%	**5.42**	$ 40,120	96%
25-9099	Education, training, and library workers, all other	360	0.1%	**1.68**	$ 18,910	59%
27-1023	Floral designers	270	0.1%	**1.74**	$ 18,420	85%
27-2022	Coaches and scouts	500	0.1%	**1.28**	$ 18,530	69%
27-2032	Choreographers	90	0.0%	**2.18**	$ 33,460	97%
27-3011	Radio and television announcers	360	0.1%	**3.55**	$ 23,710	98%
27-3012	Public address system and other announcers	40	0.0%	**1.90**	$ 17,720	71%
27-3021	Broadcast news analysts	40	0.0%	**2.33**	$ 24,650	53%
27-3022	Reporters and correspondents	230	0.1%	**1.71**	$ 25,260	75%
27-4012	Broadcast technicians	160	0.0%	**1.97**	$ 20,710	67%
27-4021	Photographers	220	0.1%	**1.44**	$ 30,680	117%
29-1011	Chiropractors	160	0.0%	**2.48**	$ 52,740	81%
29-1031	Dietitians and nutritionists	190	0.1%	**1.46**	$ 42,160	90%
29-1041	Optometrists	160	0.0%	**2.61**	$ 79,520	87%
29-1062	Family and general practitioners	340	0.1%	**1.23**	#	0%
29-1071	Physician assistants	300	0.1%	**1.88**	$ 66,860	89%
29-1122	Occupational therapists	360	0.1%	**1.61**	$ 50,560	84%
29-1123	Physical therapists	490	0.1%	**1.24**	$ 59,440	90%
29-1124	Radiation therapists	70	0.0%	**1.93**	$ 62,220	94%

Occupations With High Occupational Location Quotients in North Dakota, 2006
& Median Annual Salary Comparisons **Page 2 of 3**

SOC	Occupational Title	Employment, May 2006		Occupational	Median Salary	
		Number	% of total	L.Q.	ND 2006	% of US
29-1127	Speech-language pathologists	470	0.1%	**1.88**	$ 44,160	77%
29-2021	Dental hygienists	600	0.2%	**1.42**	$ 52,410	83%
29-2061	Licensed practical and licensed vocational nurses	2920	0.9%	**1.60**	$ 32,050	88%
29-2071	Medical records and health information technician	620	0.2%	**1.49**	$ 25,020	89%
29-2081	Opticians, dispensing	460	0.1%	**2.79**	$ 23,010	76%
29-9091	Athletic trainers	50	0.0%	**1.28**	$ 33,140	91%
31-1012	Nursing aides, orderlies, and attendants	6370	1.9%	**1.83**	$ 21,430	97%
31-9094	Medical transcriptionists	510	0.2%	**2.32**	$ 26,770	89%
31-9095	Pharmacy aides	230	0.1%	**1.90**	$ 19,180	99%
33-3031	Fish and game wardens	40	0.0%	**2.10**	$ 51,730	118%
35-2015	Cooks, short order	710	0.2%	**1.48**	$ 17,140	96%
35-3011	Bartenders	2610	0.8%	**2.12**	$ 15,400	94%
35-3022	Counter attendants, cafeteria, food concession, a	1670	0.5%	**1.26**	$ 15,200	94%
35-3031	Waiters and waitresses	7160	2.1%	**1.22**	$ 13,600	92%
37-1011	First-line supervisors/managers of housekeeping	570	0.2%	**1.23**	$ 26,730	85%
37-2011	Janitors and cleaners, except maids and houseke	6760	2.0%	**1.26**	$ 19,660	99%
37-2012	Maids and housekeeping cleaners	3370	1.0%	**1.48**	$ 16,080	91%
37-3012	Pesticide handlers, sprayers, and applicators, veg	120	0.0%	**1.83**	$ 25,850	97%
39-1011	Gaming supervisors	160	0.0%	**2.65**	$ 31,320	76%
39-1012	Slot key persons	90	0.0%	**2.64**	$ 21,900	96%
39-3011	Gaming dealers	1100	0.3%	**5.24**	$ 16,400	111%
39-3012	Gaming and sports book writers and runners	320	0.1%	**7.11**	$ 18,940	101%
39-3021	Motion picture projectionists	50	0.0%	**1.86**	$ 14,900	85%
39-3031	Ushers, lobby attendants, and ticket takers	360	0.1%	**1.40**	$ 13,930	88%
39-4011	Embalmers	40	0.0%	**1.78**	$ 33,830	89%
39-4021	Funeral attendants	110	0.0%	**1.35**	$ 17,330	85%
39-5012	Hairdressers, hairstylists, and cosmetologists	1330	0.4%	**1.52**	$ 21,340	100%
39-6021	Tour guides and escorts	110	0.0%	**1.43**	$ 16,880	83%
39-9011	Child care workers	2020	0.6%	**1.39**	$ 16,270	92%
39-9021	Personal and home care aides	1840	0.5%	**1.26**	$ 18,070	102%
39-9032	Recreation workers	950	0.3%	**1.37**	$ 19,940	97%
39-9041	Residential advisors	520	0.2%	**4.24**	$ 19,510	86%
41-2012	Gaming change persons and booth cashiers	190	0.1%	**2.81**	$ 20,550	99%
41-2021	Counter and rental clerks	1680	0.5%	**1.42**	$ 16,730	85%
41-2022	Parts salespersons	1370	0.4%	**2.30**	$ 26,260	96%
41-3021	Insurance sales agents	1070	0.3%	**1.36**	$ 46,050	105%
41-3041	Travel agents	650	0.2%	**2.93**	$ 22,810	78%
41-9041	Telemarketers	1460	0.4%	**1.50**	$ 18,710	89%
43-2011	Switchboard operators, including answering servi	680	0.2%	**1.56**	$ 21,230	94%
43-3031	Bookkeeping, accounting, and auditing clerks	5970	1.8%	**1.27**	$ 25,670	84%
43-3071	Tellers	2150	0.6%	**1.41**	$ 20,470	92%
43-4061	Eligibility interviewers, government programs	380	0.1%	**1.41**	$ 31,340	83%
43-4081	Hotel, motel, and resort desk clerks	920	0.3%	**1.70**	$ 16,300	88%
43-5053	Postal service mail sorters, processors, and proce	630	0.2%	**1.23**	$ 38,730	88%
43-9031	Desktop publishers	130	0.0%	**1.69**	$ 22,940	67%
43-9061	Office clerks, general	9690	2.9%	**1.26**	$ 20,710	87%
45-1011	First-line supervisors/managers of farming, fishing	60	0.0%	**1.20**	$ 44,350	117%
45-2011	Agricultural inspectors	130	0.0%	**3.47**	$ 33,970	89%
45-2041	Graders and sorters, agricultural products	300	0.1%	**2.58**	$ 18,550	108%
45-2091	Agricultural equipment operators	150	0.0%	**2.80**	$ 25,360	125%
45-2099	Agricultural workers, all other	70	0.0%	**3.23**	$ 22,100	98%
45-4011	Forest and conservation workers	120	0.0%	**5.56**	$ 21,910	105%
47-2051	Cement masons and concrete finishers	690	0.2%	**1.25**	$ 29,220	89%
47-2073	Operating engineers and other construction equip	2200	0.7%	**2.21**	$ 35,700	97%
47-2132	Insulation workers, mechanical	210	0.1%	**2.97**	$ 32,990	89%
47-2211	Sheet metal workers	540	0.2%	**1.20**	$ 35,180	94%
47-2221	Structural iron and steel workers	220	0.1%	**1.29**	$ 37,300	92%
47-3012	Helpers--carpenters	920	0.3%	**3.49**	$ 21,790	94%
47-3016	Helpers--roofers	150	0.0%	**2.81**	$ 22,000	101%
47-4051	Highway maintenance workers	590	0.2%	**1.68**	$ 29,060	92%
47-5011	Derrick operators, oil and gas	320	0.1%	**7.47**	$ 45,140	125%
47-5012	Rotary drill operators, oil and gas	310	0.1%	**6.80**	$ 44,460	116%
47-5013	Service unit operators, oil, gas, and mining	580	0.2%	**9.03**	$ 40,240	122%
47-5021	Earth drillers, except oil and gas	60	0.0%	**1.24**	$ 34,370	100%
47-5071	Roustabouts, oil and gas	460	0.1%	**4.42**	$ 31,820	124%
49-2011	Computer, automated teller, and office machine re	450	0.1%	**1.27**	$ 33,590	92%
49-2095	Electrical and electronics repairers, powerhouse,	190	0.1%	**3.40**	$ 62,960	110%
49-2097	Electronic home entertainment equipment installe	150	0.0%	**1.68**	$ 27,460	92%
49-3021	Automotive body and related repairers	480	0.1%	**1.22**	$ 36,070	103%

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SOC	Occupational Title	Employment, May 2006		Occupational	Median Salary	
		Number	% of total	L.Q.	ND 2006	% of US
49-3022	Automotive glass installers and repairers	70	0.0%	**1.48**	$ 23,290	76%
49-3031	Bus and truck mechanics and diesel engine speci	980	0.3%	**1.52**	$ 34,670	92%
49-3041	Farm equipment mechanics	710	0.2%	**9.51**	$ 29,420	100%
49-3042	Mobile heavy equipment mechanics, except engir	600	0.2%	**1.99**	$ 39,850	99%
49-3043	Rail car repairers	120	0.0%	**1.99**	$ 47,110	109%
49-3052	Motorcycle mechanics	80	0.0%	**1.89**	$ 27,450	91%
49-3091	Bicycle repairers	40	0.0%	**1.89**	$ 21,880	100%
49-9011	Mechanical door repairers	220	0.1%	**5.74**	$ 27,120	86%
49-9021	Heating, air conditioning, and refrigeration mecha	810	0.2%	**1.27**	$ 32,390	86%
49-9031	Home appliance repairers	170	0.1%	**1.57**	$ 25,810	76%
49-9051	Electrical power-line installers and repairers	610	0.2%	**2.18**	$ 53,570	105%
49-9062	Medical equipment repairers	110	0.0%	**1.35**	$ 38,370	95%
49-9069	Precision instrument and equipment repairers, all	40	0.0%	**1.22**	$ 46,730	101%
49-9091	Coin, vending, and amusement machine servicers	190	0.1%	**1.90**	$ 27,180	95%
49-9098	Helpers--installation, maintenance, and repair wo	500	0.1%	**1.24**	$ 19,930	89%
51-2041	Structural metal fabricators and fitters	400	0.1%	**1.58**	$ 29,180	96%
51-3011	Bakers	650	0.2%	**1.84**	$ 19,490	88%
51-3021	Butchers and meat cutters	490	0.1%	**1.51**	$ 22,540	84%
51-3091	Food and tobacco roasting, baking, and drying ma	80	0.0%	**1.71**	$ 35,360	150%
51-4121	Welders, cutters, solderers, and brazers	1690	0.5%	**1.77**	$ 32,000	102%
51-4194	Tool grinders, filers, and sharpeners	80	0.0%	**1.79**	$ 26,680	87%
51-7011	Cabinetmakers and bench carpenters	400	0.1%	**1.24**	$ 26,820	99%
51-7042	Woodworking machine setters, operators, and ter	970	0.3%	**3.92**	$ 23,730	99%
51-8012	Power distributors and dispatchers	30	0.0%	**1.41**	$ 70,380	112%
51-8013	Power plant operators	140	0.0%	**1.62**	$ 58,920	107%
51-8031	Water and liquid waste treatment plant and syster	510	0.2%	**1.89**	$ 35,540	99%
51-8093	Petroleum pump system operators, refinery opera	310	0.1%	**3.00**	$ 49,400	94%
51-9012	Separating, filtering, clarifying, precipitating, and s	350	0.1%	**3.17**	$ 27,580	79%
51-9021	Crushing, grinding, and polishing machine setters	210	0.1%	**1.98**	$ 35,780	127%
51-9051	Furnace, kiln, oven, drier, and kettle operators an	100	0.0%	**1.46**	$ 32,030	106%
53-2012	Commercial pilots	210	0.1%	**3.06**	$ 53,850	94%
53-3011	Ambulance drivers and attendants, except emerg	90	0.0%	**1.68**	$ 17,160	84%
53-3022	Bus drivers, school	1780	0.5%	**1.54**	$ 27,310	110%
53-3031	Driver/sales workers	1540	0.5%	**1.53**	$ 19,580	94%
53-3032	Truck drivers, heavy and tractor-trailer	6250	1.9%	**1.47**	$ 33,100	94%
53-3041	Taxi drivers and chauffeurs	540	0.2%	**1.38**	$ 16,300	80%
53-6031	Service station attendants	570	0.2%	**2.38**	$ 18,040	102%
53-6051	Transportation inspectors	90	0.0%	**1.49**	$ 56,530	112%
53-7011	Conveyor operators and tenders	800	0.2%	**6.31**	$ 25,360	93%
53-7032	Excavating and loading machine and dragline ope	280	0.1%	**1.64**	$ 37,300	113%
53-7061	Cleaners of vehicles and equipment	1050	0.3%	**1.24**	$ 16,050	89%
53-7073	Wellhead pumpers	190	0.1%	**5.65**	$ 35,380	98%
53-7081	Refuse and recyclable material collectors	560	0.2%	**1.76**	$ 24,920	86%

Source: Bureau of Labor Statistics, May 2006 State Occupational Employment and Wage Estimates
http://www.bls.gov/oes/current/oessrcst.htm

Occupations With Low Occupational Location Quotients in North Dakota, 2006
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SOC	Occupational Title	Employment, May 2006		Occupational	Median Salary	
		Number	% of total	L.Q.	ND 2006	% of US
11-3011	Administrative services managers	450	0.1%	0.76	$ 54,460	80%
11-3021	Computer and information systems managers	470	0.1%	0.74	$ 74,090	73%
11-3051	Industrial production managers	300	0.1%	0.77	$ 62,840	81%
11-9041	Engineering managers	300	0.1%	0.64	$ 85,120	81%
11-9051	Food service managers	310	0.1%	0.65	$ 45,320	105%
11-9141	Property, real estate, and community association managers	230	0.1%	0.58	$ 41,030	95%
11-9199	Managers, all other	360	0.1%	0.44	$ 65,070	79%
13-1023	Purchasing agents, except wholesale, retail, and farm products	530	0.2%	0.76	$ 45,660	90%
13-1071	Employment, recruitment, and placement specialists	320	0.1%	0.68	$ 37,740	89%
13-1073	Training and development specialists	310	0.1%	0.62	$ 38,470	80%
13-1079	Human resources, training, and labor relations specialists, all other	250	0.1%	0.48	$ 47,040	90%
13-1111	Management analysts	370	0.1%	0.31	$ 55,680	82%
13-1199	Business operations specialists, all other	1,300	0.4%	0.52	$ 48,410	87%
13-2051	Financial analysts	240	0.1%	0.48	$ 63,980	96%
15-1021	Computer programmers	690	0.2%	0.69	$ 41,600	64%
15-1031	Computer software engineers, applications	680	0.2%	0.57	$ 52,700	66%
15-1032	Computer software engineers, systems software	340	0.1%	0.41	$ 64,440	75%
15-1041	Computer support specialists	930	0.3%	0.71	$ 30,530	74%
15-1051	Computer systems analysts	770	0.2%	0.68	$ 47,790	69%
15-1071	Network and computer systems administrators	510	0.2%	0.70	$ 44,860	72%
15-1081	Network systems and data communications analysts	350	0.1%	0.68	$ 44,140	68%
17-2112	Industrial engineers	370	0.1%	0.74	$ 62,440	91%
17-2141	Mechanical engineers	410	0.1%	0.74	$ 61,170	88%
17-3023	Electrical and electronic engineering technicians	210	0.1%	0.50	$ 47,310	93%
23-1011	Lawyers	670	0.2%	0.48	$ 68,620	67%
23-2011	Paralegals and legal assistants	240	0.1%	0.41	$ 37,460	87%
25-2011	Preschool teachers, except special education	530	0.2%	0.58	$ 22,310	98%
25-2012	Kindergarten teachers, except special education	330	0.1%	0.79	$ 37,360	86%
29-1069	Physicians and surgeons, all other	260	0.1%	0.49	$ 120,600	0%
29-2052	Pharmacy technicians	370	0.1%	0.52	$ 26,320	103%
31-9091	Dental assistants	490	0.1%	0.70	$ 28,250	93%
31-9092	Medical assistants	420	0.1%	0.41	$ 24,810	94%
33-2011	Fire fighters	390	0.1%	0.54	$ 40,750	99%
33-3012	Correctional officers and jailers	650	0.2%	0.61	$ 29,200	82%
33-3051	Police and sheriff's patrol officers	980	0.3%	0.62	$ 39,120	82%
33-9032	Security guards	1,110	0.3%	0.44	$ 20,520	95%
35-2011	Cooks, fast food	1,170	0.3%	0.76	$ 15,100	98%
35-2021	Food preparation workers	1,590	0.5%	0.72	$ 17,880	103%
35-9011	Dining room and cafeteria attendants and bartender helpers	740	0.2%	0.73	$ 14,270	93%
37-1012	First-line supervisors/managers of landscaping, lawn service, and groundskeeping workers	200	0.1%	0.71	$ 34,830	93%
41-1012	First-line supervisors/managers of non-retail sales workers	540	0.2%	0.75	$ 45,280	69%
41-3031	Securities, commodities, and financial services sales agents	410	0.1%	0.62	$ 45,250	66%
41-3099	Sales representatives, services, all other	310	0.1%	0.24	$ 40,390	84%
41-4011	Sales representatives, wholesale and manufacturing, technical and scientific products	630	0.2%	0.64	$ 53,240	83%
41-9099	Sales and related workers, all other	220	0.1%	0.54	$ 27,850	81%
43-3011	Bill and account collectors	800	0.2%	0.75	$ 23,510	81%
43-3021	Billing and posting clerks and machine operators	990	0.3%	0.76	$ 25,590	89%
43-4031	Court, municipal, and license clerks	200	0.1%	0.74	$ 26,810	87%
43-4151	Order clerks	410	0.1%	0.61	$ 24,700	94%
43-4161	Human resources assistants, except payroll and timekeeping	290	0.1%	0.72	$ 29,760	88%
43-5061	Production, planning, and expediting clerks	320	0.1%	0.44	$ 36,760	95%
43-5071	Shipping, receiving, and traffic clerks	1,530	0.5%	0.79	$ 24,620	94%
43-6013	Medical secretaries	660	0.2%	0.66	$ 23,890	85%
43-9022	Word processors and typists	300	0.1%	0.77	$ 23,710	81%
43-9051	Mail clerks and mail machine operators, except postal service	260	0.1%	0.73	$ 20,850	88%
45-2092	Farmworkers and laborers, crop, nursery, and greenhouse	280	0.1%	0.48	$ 22,910	139%
47-2021	Brickmasons and blockmasons	220	0.1%	0.74	$ 45,590	106%
47-2081	Drywall and ceiling tile installers	230	0.1%	0.65	$ 29,200	81%
47-2141	Painters, construction and maintenance	430	0.1%	0.64	$ 28,060	90%
47-2152	Plumbers, pipefitters, and steamfitters	760	0.2%	0.69	$ 40,550	95%
47-2181	Roofers	240	0.1%	0.76	$ 30,020	93%
49-9099	Installation, maintenance, and repair workers, all other	260	0.1%	0.79	$ 36,460	111%
51-2022	Electrical and electronic equipment assemblers	310	0.1%	0.58	$ 22,280	87%
51-4041	Machinists	440	0.1%	0.45	$ 34,060	98%
51-5023	Printing machine operators	280	0.1%	0.58	$ 22,940	74%
51-9061	Inspectors, testers, sorters, samplers, and weighers	620	0.2%	0.51	$ 29,900	102%

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SOC	Occupational Title	Employment, May 2006		Occupational	Median Salary	
		Number	% of total	L.Q.	ND 2006	% of US
19-3021	Market research analysts	190	0.1%	0.35	$ 46,510	79%
27-3041	Editors	180	0.1%	0.71	$ 42,150	90%
17-3011	Architectural and civil drafters	180	0.1%	0.66	$ 34,000	81%
25-1071	Health specialties teachers, postsecondary	180	0.1%	0.61	$ 58,760	76%
17-2072	Electronics engineers, except computer	180	0.1%	0.54	$ 73,170	90%
17-1011	Architects, except landscape and naval	170	0.1%	0.66	$ 47,970	75%
51-9023	Mixing and blending machine setters, operators, and tenders	170	0.1%	0.48	$ 24,040	82%
51-6031	Sewing machine operators	170	0.1%	0.31	$ 20,140	107%
43-9199	Office and administrative support workers, all other	170	0.1%	0.24	$ 29,490	108%
25-3099	Teachers and instructors, all other	170	0.1%	0.12	$ 42,790	149%
41-9011	Demonstrators and product promoters	160	0.0%	0.76	$ 18,380	83%
43-5031	Police, fire, and ambulance dispatchers	160	0.0%	0.67	$ 28,870	92%
17-2199	Engineers, all other	160	0.0%	0.41	*	88%
41-9022	Real estate sales agents	160	0.0%	0.38	$ 42,730	107%
53-7063	Machine feeders and offbearers	150	0.0%	0.39	$ 24,710	109%
15-1099	Computer specialists, all other	150	0.0%	0.33	$ 55,730	81%
53-3021	Bus drivers, transit and intercity	150	0.0%	0.31	$ 21,640	67%
29-2056	Veterinary technologists and technicians	140	0.0%	0.79	$ 25,740	96%
43-4141	New accounts clerks	140	0.0%	0.68	$ 25,590	90%
51-9041	Extruding, forming, pressing, and compacting machine setters, operators, and tenders	140	0.0%	0.68	$ 26,830	97%
49-9043	Maintenance workers, machinery	140	0.0%	0.68	$ 29,250	85%
33-1012	First-line supervisors/managers of police and detectives	140	0.0%	0.62	$ 55,800	81%
47-3013	Helpers--electricians	140	0.0%	0.55	$ 20,190	85%
35-1011	Chefs and head cooks	140	0.0%	0.53	$ 27,660	80%
51-4072	Molding, coremaking, and casting machine setters, operators, and tenders, metal and plastic	140	0.0%	0.36	$ 20,880	82%
51-2099	Assemblers and fabricators, all other	140	0.0%	0.19	$ 19,670	74%
13-2041	Credit analysts	130	0.0%	0.77	$ 58,050	111%
51-6021	Pressers, textile, garment, and related materials	130	0.0%	0.68	$ 17,500	98%
19-2031	Chemists	130	0.0%	0.64	$ 52,920	88%
29-1021	Dentists, general	130	0.0%	0.60	#	0%
43-5021	Couriers and messengers	130	0.0%	0.49	$ 18,730	87%
43-4121	Library assistants, clerical	130	0.0%	0.47	$ 15,110	70%
31-2021	Physical therapist assistants	120	0.0%	0.80	$ 28,800	70%
13-2021	Appraisers and assessors of real estate	120	0.0%	0.71	$ 34,650	78%
49-2094	Electrical and electronics repairers, commercial and industrial equipment	120	0.0%	0.60	$ 45,980	102%
43-9071	Office machine operators, except computer	120	0.0%	0.52	$ 23,590	96%
51-3092	Food batchmakers	120	0.0%	0.51	$ 18,850	82%
13-1072	Compensation, benefits, and job analysis specialists	120	0.0%	0.46	$ 47,310	94%
47-4099	Construction and related workers, all other	110	0.0%	0.77	$ 29,720	98%
11-3061	Purchasing managers	110	0.0%	0.65	$ 67,600	n.a.
53-3099	Motor vehicle operators, all other	110	0.0%	0.60	$ 22,240	98%
33-9099	Protective service workers, all other	110	0.0%	0.54	$ 29,390	109%
53-6021	Parking lot attendants	110	0.0%	0.33	$ 14,270	82%
51-4011	Computer-controlled machine tool operators, metal and plastic	110	0.0%	0.31	$ 32,170	102%
29-1131	Veterinarians	100	0.0%	0.79	$ 58,770	82%
25-1042	Biological science teachers, postsecondary	100	0.0%	0.76	$ 50,500	73%
51-4081	Multiple machine tool setters, operators, and tenders, metal and plastic	100	0.0%	0.41	$ 23,540	77%
17-3027	Mechanical engineering technicians	90	0.0%	0.76	$ 42,000	92%
29-9099	Healthcare practitioners and technical workers, all other	90	0.0%	0.70	$ 47,450	128%
17-2081	Environmental engineers	90	0.0%	0.69	$ 52,480	75%
51-9122	Painters, transportation equipment	90	0.0%	0.68	$ 29,100	82%
13-2031	Budget analysts	90	0.0%	0.61	$ 53,850	88%
17-3029	Engineering technicians, except drafters, all other	90	0.0%	0.45	$ 41,970	77%
39-2021	Nonfarm animal caretakers	90	0.0%	0.33	$ 14,900	82%
47-2082	Tapers	80	0.0%	0.79	$ 27,920	68%
51-3093	Food cooking machine operators and tenders	80	0.0%	0.72	$ 27,260	128%
29-1063	Internists, general	80	0.0%	0.65	#	0%
49-9044	Millwrights	80	0.0%	0.59	$ 45,310	99%
39-9099	Personal care and service workers, all other	80	0.0%	0.54	$ 17,540	92%
29-2053	Psychiatric technicians	80	0.0%	0.54	$ 24,020	86%
51-7041	Sawing machine setters, operators, and tenders, wood	80	0.0%	0.52	$ 21,920	90%
13-2082	Tax preparers	80	0.0%	0.50	$ 30,130	110%

Source: Bureau of Labor Statistics, May 2006 State Occupational Employment and Wage Estimates
http://www.bls.gov/oes/current/oessrcst.htm

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SOC	Occupational Title	Employment, May 2006		Occupational	Median Salary	
		Number	% of total	L.Q.	ND 2006	% of US
47-4011	Construction and building inspectors	80	0.0%	0.33	$ 49,010	105%
51-4111	Tool and die makers	80	0.0%	0.33	$ 35,860	81%
13-2053	Insurance underwriters	80	0.0%	0.32	$ 44,110	84%
33-1011	First-line supervisors/managers of correctional officers	70	0.0%	0.74	$ 43,270	82%
51-4193	Plating and coating machine setters, operators, and tenders, metal and plastic	70	0.0%	0.67	$ 24,020	87%
47-2121	Glaziers	70	0.0%	0.53	$ 28,990	84%
37-2021	Pest control workers	70	0.0%	0.44	$ 39,310	141%
27-2012	Producers and directors	70	0.0%	0.43	$ 41,000	73%
13-2081	Tax examiners, collectors, and revenue agents	70	0.0%	0.37	$ 59,010	129%
51-3022	Meat, poultry, and fish cutters and trimmers	70	0.0%	0.20	$ 21,510	106%
47-2131	Insulation workers, floor, ceiling, and wall	60	0.0%	0.75	$ 26,320	86%
17-3012	Electrical and electronics drafters	60	0.0%	0.73	$ 34,270	73%
51-2091	Fiberglass laminators and fabricators	60	0.0%	0.73	$ 24,730	95%
19-3051	Urban and regional planners	60	0.0%	0.73	$ 51,660	91%
53-6099	Transportation workers, all other	60	0.0%	0.56	$ 22,290	74%
29-2032	Diagnostic medical sonographers	60	0.0%	0.53	$ 56,590	99%
47-2044	Tile and marble setters	60	0.0%	0.46	$ 22,040	60%
19-4099	Life, physical, and social science technicians, all other	60	0.0%	0.41	$ 42,340	112%
25-3011	Adult literacy, remedial education, and GED teachers and instructors	60	0.0%	0.33	$ 47,460	108%
43-4011	Brokerage clerks	60	0.0%	0.33	$ 28,770	79%
13-2099	Financial specialists, all other	60	0.0%	0.20	$ 48,760	91%
49-3053	Outdoor power equipment and other small engine mechanics	50	0.0%	0.77	$ 22,740	85%
37-3013	Tree trimmers and pruners	50	0.0%	0.70	$ 23,790	84%
27-4011	Audio and video equipment technicians	50	0.0%	0.49	$ 32,540	93%
31-9011	Massage therapists	50	0.0%	0.47	$ 25,060	75%
27-3043	Writers and authors	50	0.0%	0.46	$ 36,500	75%
27-3042	Technical writers	50	0.0%	0.44	$ 43,750	75%
33-1021	First-line supervisors/managers of fire fighting and prevention workers	50	0.0%	0.39	$ 54,630	87%
19-4031	Chemical technicians	50	0.0%	0.33	$ 23,720	60%
51-4033	Grinding, lapping, polishing, and buffing machine tool setters, operators, and tenders, metal and plastic	50	0.0%	0.20	$ 24,840	88%
49-2092	Electric motor, power tool, and related repairers	40	0.0%	0.71	$ 27,290	83%
27-4031	Camera operators, television, video, and motion picture	40	0.0%	0.71	$ 17,750	44%
51-6052	Tailors, dressmakers, and custom sewers	40	0.0%	0.53	$ 20,090	88%
27-1011	Art directors	40	0.0%	0.51	$ 56,700	83%
19-3099	Social scientists and related workers, all other	40	0.0%	0.51	$ 57,320	88%
51-9022	Grinding and polishing workers, hand	40	0.0%	0.36	$ 21,260	89%
33-1099	First-line supervisors/managers, protective service workers, all other	40	0.0%	0.35	$ 39,230	94%
11-9031	Education administrators, preschool and child care center/program	40	0.0%	0.34	$ 32,080	n.a.
39-6011	Baggage porters and bellhops	40	0.0%	0.33	$ 14,500	79%
29-2099	Health technologists and technicians, all other	40	0.0%	0.22	$ 37,190	106%
53-2011	Airline pilots, copilots, and flight engineers	40	0.0%	0.21	$ 71,230	50%
13-1081	Logisticians	40	0.0%	0.20	$ 57,790	91%
25-3021	Self-enrichment education teachers	40	0.0%	0.11	$ 14,770	44%
49-9094	Locksmiths and safe repairers	30	0.0%	0.66	$ 22,940	72%
29-2033	Nuclear medicine technologists	30	0.0%	0.61	$ 52,260	84%
17-2041	Chemical engineers	30	0.0%	0.41	$ 74,730	95%
47-4041	Hazardous materials removal workers	30	0.0%	0.31	$ 33,830	95%
47-2161	Plasterers and stucco masons	30	0.0%	0.23	$ 38,870	112%
11-3049	Human resources managers, all other	30	0.0%	0.21	$ 67,170	n.a.

Source: Bureau of Labor Statistics, May 2006 State Occupational Employment and Wage Estimates
http://www.bls.gov/oes/current/oessrcst.htm

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