OCCASIONAL PAPER NO. 4

Outlook 2010 Revisited: Wyoming's Labor Market at Mid-Decade

May 2006

Research & Planning

Wyoming Department of Employment

An in-depth review of Wyoming Labor Market Information topics.

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Krista R. Shinkle, Editor, (307) 473-3808, e-mail: kshink@state.wy.us
Phil Ellsworth, Associate Editor, (307) 473-3818, e-mail: pellsw@state.wy.us

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Contents

Introduction

Tom Gallagher, Manager

At mid-decade, Wyoming has a high labor force participation rate, a low unemployment rate, and a relatively high employment growth rate. The state began the decade with an older population well established in the labor market. As a result, early and mid-decade employment growth is increasingly sustained by a market-based reallocation of workers. The reallocation is occurring across industries and among geographic locations within the state and is supported by an increasing number of nonresident workers.

In the present and foreseeable future, employment growth and the human resource reallocation process makes moot the question of "declining industries" and "skills gaps" and instead raises the question of the simple physical availability of a trainable workforce.

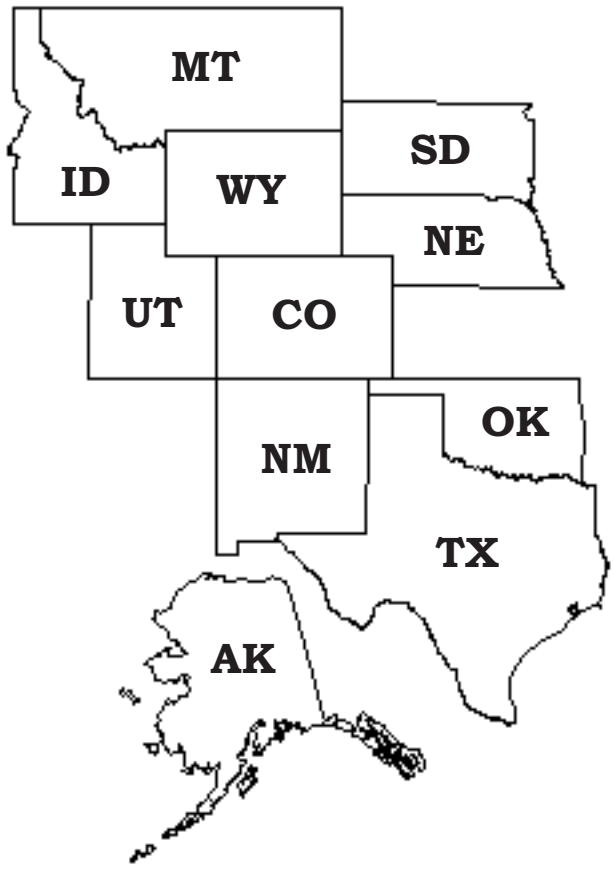
In many instances, new jobs require skills that can be obtained primarily through training on the job. At the same time, the continued lack of diversity in demand in Wyoming's labor market means that the use of post-high school degrees is often associated with out-migration. Despite relatively strong labor market growth in Wyoming, the same set of skills is consistently in demand. The lack of diversity in demand can quickly lead to competition for the same or comparable skills from multiple industries making "critical" jobs a function of dynamic market forces and limited locally available supply. In these market and demographic circumstances, critical jobs and skills become those that either impinge upon the growth of base export industries (e.g., Mining) or that constrain a necessary socio-economic function (e.g., the provision of health care). The available evidence indicates that the state continues to export younger, educated persons while producing jobs requiring on-the-job training as the minimum requisite skill set.

A large number of people have contact with Wyoming's labor market, but the worker-market relationship is unstable. Worker flow data indicate in 2001, 26.1% of workers left Wyoming's market. Of these, 28,704 (8.9%) found work in a partner research state (see Map, page 2). In addition, cohort analysis reveals that for persons ages 18-24, after 10 years, 56.6% are no longer working in Wyoming. At the same time, the net number of workers in the state continues to increase. A defining feature of Wyoming's market is not only the large volume of movement among workers finding employment in the state but the large number leaving this market as well.

Traditional labor market analysis strategies focus on the projected net change in the number of jobs by occupation. Wyoming faces a more complex problem: finding workers on an ongoing basis to work in short-term and often seasonal employment. Short-term and seasonal positions are frequently staffed by youth and nonresidents, which makes the supply of labor vulnerable to demographic change and regional competition. Moreover, the experience and skills of youth and nonresidents are often non-transferable to occupations in Mining or Construction, or the complex of industries, which support these industries.

Net change in employment implies one set of demands upon the workforce development system, while the large gross flow of human resources into and out of Wyoming implies another. For example, a dependence upon nonresident human resources means that

Map: Partner Research States Exchanging Employment Records



the workforce development system for these people is also a nonresident system. A second consequence is that the availability of workers in Wyoming, to a significant degree, depends upon regional competition for labor and regional demographics.

Since the beginning of the recession (from first quarter 2001 to fourth quarter 2001; NBER, 2005), establishment-based employment growth in Wyoming has generally outpaced both national employment growth and growth in surrounding states. In 2004, this began to change. Neighboring states which compete for labor in Wyoming's market began to show improved economic conditions. Colorado's employment level dropped from 2.22 million jobs in 2001 to 2.15 million jobs in 2003, but began to demonstrate growth in the spring of 2004. In January 2005, establishment employment grew at an over-the-year rate of 2.1%, rivaling Wyoming's 2.2% growth rate. Colorado's seasonally adjusted unemployment rate dropped from 5.8% in January 2004 to 4.9% in January 2005 (U.S. Bureau of Labor Statistics, 2005). Utah's unemployment rate for the same period (January 2005) dropped at a similar pace, while over-the-year establishment

employment grew by 3.0%, slightly below Montana's 3.2% growth rate. Persistent growth in these and other states in the region will intensify the competition for workers in Wyoming and put upward pressure on compensation.

Increased regional competition, coupled with demographic change, is likely to raise labor costs and make the supply of labor increasingly problematic. As discussed in previous reports (Wyoming Department of Employment, 2003) and later in this report, the national-, regional-, and state-level domestic population is forecasted to grow more slowly than in the previous decade. This means that labor shortages are unlikely to be simply a local phenomenon but a feature of the market in general.

References

National Bureau of Economic Research (NBER). (2005, April 21). Business cycle expansions and contractions. *NBER website*. Retrieved April 5, 2005, from http://www.nber.org/cycles/cyclesmain.html

U.S. Bureau of Labor Statistics. (2005, March 10). Regional and state employment and unemployment. *News release* (USDL 05-384). Retrieved April 21, 2005, from http://www.bls.gov/news.release/archives/laus_03102005.pdf

Wyoming Department of Employment, Research & Planning. (2003, April). *Employment outlook: 2010*. Casper, WY: Author.

Statewide Nonagricultural Employment by Industry

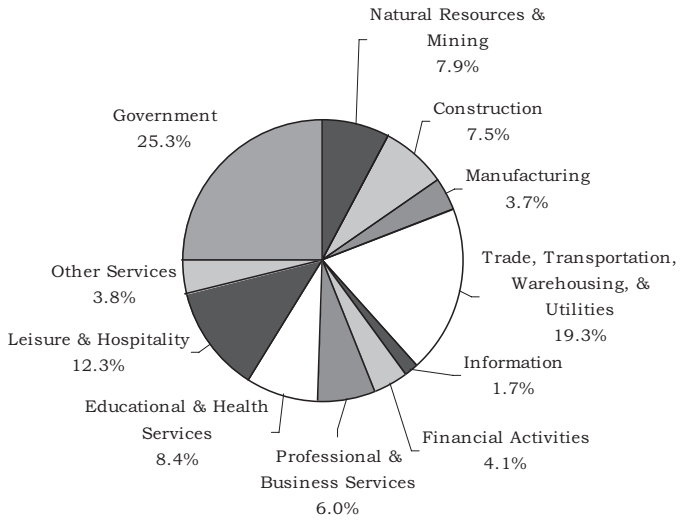
Susan Murray, Researcher

Combined, the statewide goods-producing, industries of Natural Resources & Mining, Construction and Manufacturing, employed 19.1% of Wyoming workers in 2004 (see Figure 1). Of private sector service-providing industries, Trade, Transportation, Warehousing, & Utilities had the largest percentage of employees (19.3%) followed by Leisure & Hospitality (12.3%) and Educational & Health Services (8.4%). The distribution of employees in Leisure & Hospitality remained relatively constant from its 1990 level of 12.0%. The share of employees in Educational & Health Services increased by 2.0 percentage points, possibly due to increased demand for health services from the leading edge of the baby boom generation.

Natural Resources & Mining had the largest employment distribution of all goods-producing industries with 20,200 jobs in 2004 (41.3% of all goods-producing jobs). In addition, Natural Resources & Mining consistently produced the largest Gross State Product from 1998 to 2004. Mining's share of the Gross State Product increased from 16.6% ($2.5 billion of $15.2 billion total for the state) to 21.5% ($4.4 billion of $20.3 billion total).

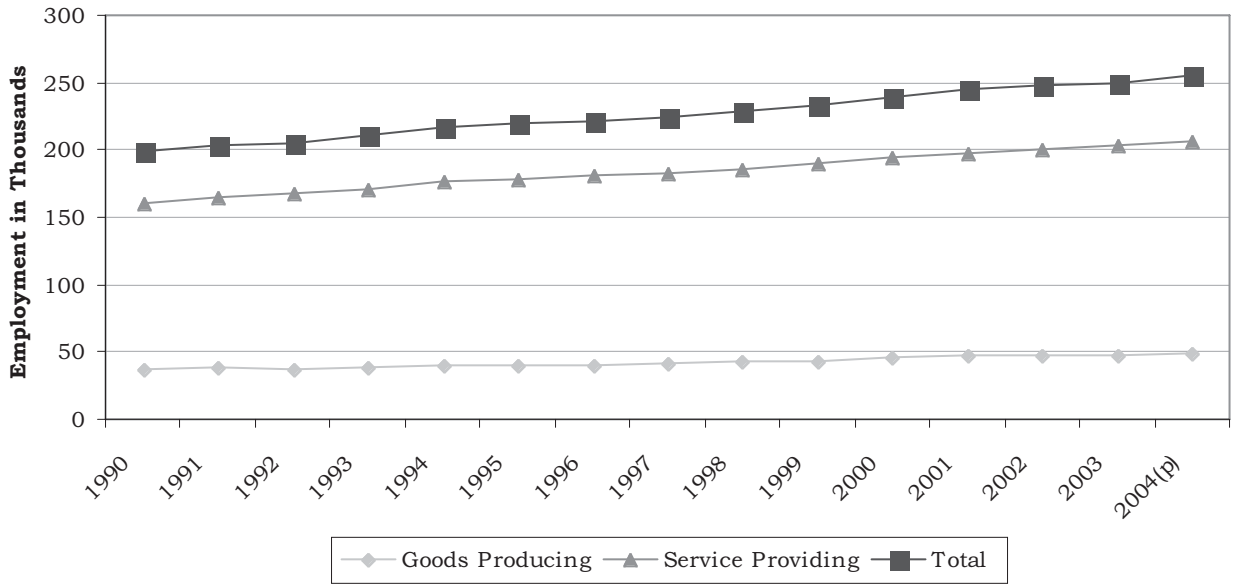
While service-providing industries led the state's nonagricultural employment, all goods-producing and service-providing industries experienced overall increases in employment from 1990 to 2004 (see Figure 2, page 6). The smallest over-the-year increases in total nonagricultural wage and salary employment during the period occurred in 1996 and 2003 (0.8% both years). Since 1991, employment growth of 2% or greater was achieved from 1993 to 1994, 1999 to 2001, and in 2004 (see Figure 3, page 6). It is normal for Wyoming's market to demonstrate periods of relatively rapid growth followed by two or more years of relatively sluggish growth. The absence of stability makes retention of the workforce problematic.

Figure 1: Industry Distribution of Wyoming Nonagricultural Wage and Salary Employment, 2004(p)



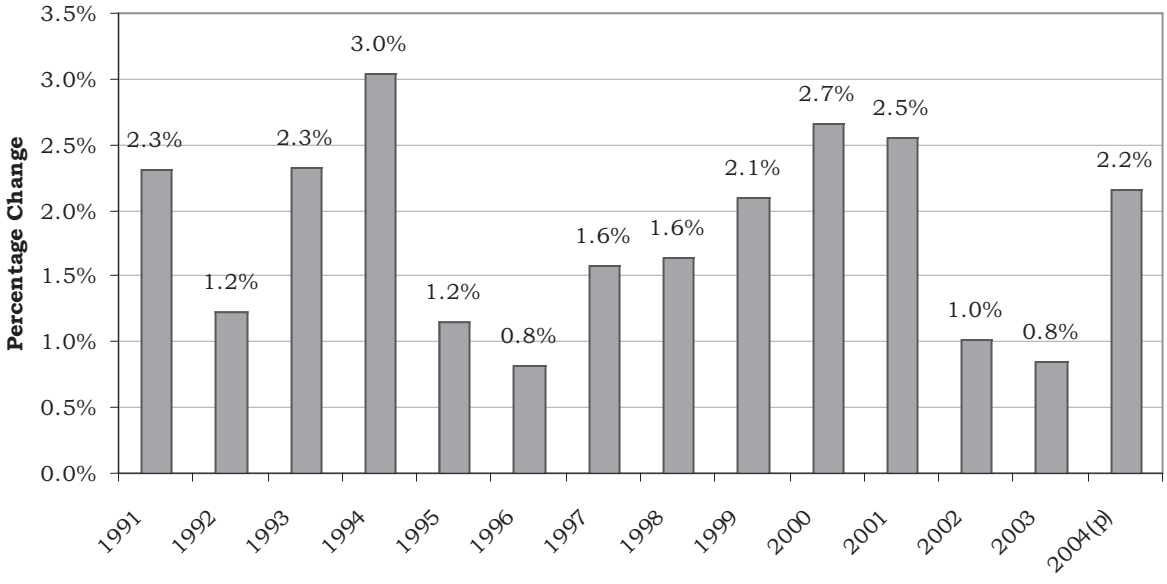
(p) Preliminary Current Employment Statistics (CES) estimates.

Figure 2: Wyoming Nonagricultural Wage and Salary Employment, 1990 to 2004



(p) Preliminary Current Employment Statistics (CES) estimates.

Figure 3: Over-the-Year Percentage Change in Wyoming Nonagricultural Wage and Salary Employment, 1991 to 2004



(p) Preliminary Current Employment Statistics (CES) estimates.

Covered Employment and Wages for Third Quarter 2005: Double-Digit Growth in Total Payroll

David Bullard, Senior Economist
tables by: Nancy Brennan

In third quarter 2005, total Unemployment Insurance (UI) covered payroll grew by $227 million or 11.6%, much higher than its five-year average (7.3%; see Table 1). The average weekly wage increased by $48 or 8.1%, also above its five-year average (5.1%). Employment also rose at a faster-than-average rate (3.2% in third quarter compared to the five-year average growth rate of 2.1%).

The Figure (see page 8) shows that growth in total wages increased from 6.5% in fourth quarter 2004 to 11.6% in third quarter 2005. Employment growth has accelerated from 0.1% in first quarter 2003 to 3.2% in third quarter 2005 (see Table 2, page 8).

Statewide Employment and Wages by Industry

The purpose of this article is to show employment and payroll changes between third quarter 2004 and third quarter 2005. These economic changes help us gauge the strength of Wyoming's economy and identify the fastest and slowest growing industries and geographic areas.

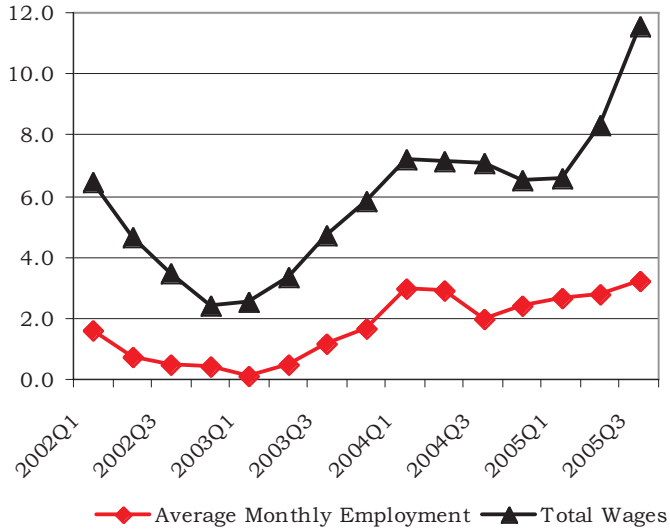
The largest job gains occurred in Mining, Construction, Local Government, Accommodation & Food Services, and Professional & Technical Services (see Table 3, page 9).

Table 1: Percentage Change in Wyoming Covered Employment and Wages for Third Quarter 2001 to Third Quarter 2005 (2001Q3 to 2005Q3)

	Average Monthly Employment Percent Change		Total Wages Percent Change		Average Weekly Wage Percent Change	
	Over the Previous Year	Over the Previous Quarter	Over the Previous Year	Over the Previous Quarter	Over the Previous Year	Over the Previous Quarter
2001Q3	3.1	2.2	9.3	2.6	5.7	0.1
2002Q3	0.8	2.0	3.5	1.3	3.0	-0.7
2003Q3	1.2	2.6	4.8	2.6	3.5	0.0
2004Q3	2.0	1.7	7.1	2.6	5.0	0.8
2005Q3	3.2	2.1	11.6	5.6	8.1	3.4
5-Year Average for Q3	2.1	2.1	7.3	2.9	5.1	0.7

Note: Preliminary.
Source: Quarterly Census of Employment and Wages, developed through a cooperative program between Research & Planning and the U.S. Bureau of Labor Statistics.
Extract Date: January 2006

Figure: Over-the-Year Percentage Change in Wyoming Covered Employment and Wages For First Quarter 2002 (2002Q1) to Third Quarter 2005 (2005Q3)



Note: Preliminary.

Source: Quarterly Census of Employment and Wages, developed through a cooperative program between Research & Planning and the U.S. Bureau of Labor Statistics.

Extract Date: January 2006

Table 2: Over-the-Year Percentage Change in Wyoming Covered Employment and Wages for First Quarter 2002 (2002Q1) to Third Quarter 2005 (2005Q3)

	Average Monthly Employment	Total Wages
2002Q1	1.6	6.5
2002Q2	0.7	4.7
2002Q3	0.5	3.5
2002Q4	0.4	2.4
2003Q1	0.1	2.6
2003Q2	0.5	3.3
2003Q3	1.2	4.7
2003Q4	1.7	5.9
2004Q1	3.0	7.2
2004Q2	2.9	7.1
2004Q3	2.0	7.1
2004Q4	2.4	6.5
2005Q1	2.6	6.6
2005Q2	2.8	8.4
2005Q3[a]	3.2	11.6

Note: Preliminary.
Source: Quarterly Census of Employment and Wages, developed through a cooperative program between Research & Planning and the U.S. Bureau of Labor Statistics.
Extract Date: January 2006

Mining (including oil & gas) added 2,413 jobs or 11.6%. It appears that high energy prices and increased drilling for natural gas are driving the growth in Wyoming's Mining industry. Job gains were reported in all three subindustries: oil & gas extraction added almost 400 jobs, mining (except oil & gas) added about 300 jobs, and support activities for mining added 1,700 jobs.

Employment in Wyoming's Construction industry grew by 1,783 jobs or 8.5%. All three subindustries added jobs, but the largest gains were in heavy & civil engineering construction.

Local Government added 889 jobs or 2.6% during third quarter. Employment increased in Educational Services (including public school districts), Health Care & Social Assistance (including public hospitals), and Public Administration (including cities, towns, & counties).

In third quarter, Accommodation & Food Services grew by 576 jobs or 1.8%. Employment increased by about 200 jobs in full-service restaurants, while it decreased in limited-service restaurants.

Employment in Professional & Technical Services increased by 407 jobs or 5.2%. The largest gains were in architectural, engineering, & related services; computer systems design & related services; and management, scientific, & technical consulting services.

Employment in ambulatory health care services, the industry which includes doctor's offices, was essentially unchanged in third quarter (-5

Table 3: Wyoming Average Monthly Employment, Total Payroll, and Average Weekly Wage for Third Quarter by Industry, 2004 and 2005[a]

Industry Title and NAICS[a] Sector	Average Monthly Employment Third Quarter 2004	2005	Change No.	%	Total Payroll Third Quarter 2004	2005	Change Amount	%	Average Weekly Wage Third Quarter 2004	2005	Change Amt.	%
Total, All Industries	**255,078**	**263,315**	**8,237**	**3.2**	**$ 1,958,379,343**	**$ 2,185,433,747**	**$227,054,404**	**11.6**	**$ 591**	**$ 638**	**$48**	**8.1**
Total Private (11-99)	**197,788**	**205,339**	**7,551**	**3.8**	**$1,480,984,552**	**$ 1,680,874,494**	**$ 199,889,942**	**13.5**	**$ 576**	**$630**	**$54**	**9.3**
Agriculture (11)	2,626	2,590	-36	-1.4	14,369,393	14,626,090	256,697	1.8	421	434	13	3.2
Mining (21)	20,852	23,265	2,413	11.6	298,845,368	363,175,176	64,329,808	21.5	1,102	1,201	98	8.9
Utilities (22)	2,227	2,290	63	2.8	35,272,364	40,868,205	5,595,841	15.9	1,218	1,373	155	12.7
Construction (23)	20,878	22,661	1,783	8.5	171,658,800	206,162,361	34,503,561	20.1	632	700	67	10.7
Manufacturing (31-33)	9,552	9,731	178	1.9	95,378,958	99,183,300	3,804,342	4.0	768	784	16	2.1
Wholesale Trade (42)	7,435	7,880	445	6.0	73,496,796	85,015,301	11,518,505	15.7	760	830	69	9.1
Retail Trade (44-45)	30,953	31,447	494	1.6	161,284,897	170,334,007	9,049,110	5.6	401	417	16	4.0
Transportation & Warehousing (48-49)	7,517	7,898	381	5.1	62,050,741	72,815,837	10,765,096	17.3	635	709	74	11.7
Information (51)	4,399	4,281	-118	-2.7	33,112,314	33,718,111	605,797	1.8	579	606	27	4.6
Finance & Insurance (52)	6,861	6,825	-36	-0.5	60,415,755	64,109,812	3,694,057	6.1	677	723	45	6.7
Real Estate & Rental & Leasing (53)	3,748	4,101	352	9.4	24,501,187	30,914,866	6,413,679	26.2	503	580	77	15.3
Professional & Technical Services (54)	7,890	8,297	407	5.2	73,033,748	83,966,192	10,932,444	15.0	712	778	66	9.3
Mgmt. of Companies & Enterprises (55)	769	771	2	0.2	11,726,405	20,595,610	8,869,205	75.6	1,172	2,055	882[b]	75.3
Administrative & Waste Services (56)	7,524	7,616	92	1.2	40,729,426	43,798,170	3,068,744	7.5	416	442	26	6.2
Educational Services (61)	1,356	1,385	29	2.1	8,378,167	8,861,958	483,791	5.8	475	492	17	3.6
Health Care & Social Assistance (62)	19,441	19,777	335	1.7	152,089,154	162,347,865	10,258,711	6.7	602	631	30	4.9
Ambulatory health care services (621)	7,421	7,416	-5	-0.1	79,500,850	82,342,449	2,841,599	3.6	824	854	30	3.6
Hospitals (622)	2,727	2,865	138	5.1	27,374,694	30,725,421	3,350,727	12.2	772	825	53	6.8
Nursing & residential care facilities (623)	4,320	4,412	92	2.1	24,519,158	26,257,174	1,738,016	7.1	437	458	21	4.9
Social assistance (624)	4,973	5,083	110	2.2	20,694,452	23,022,821	2,328,369	11.3	320	348	28	8.8
Arts, Entertainment, & Recreation (71)	3,350	3,462	112	3.4	12,736,916	14,190,686	1,453,770	11.4	292	315	23	7.8
Accommodation & Food Services (72)	32,655	33,231	576	1.8	109,491,258	119,760,345	10,269,087	9.4	258	277	19	7.5
Other Services (81)	7,753	7,831	78	1.0	42,412,905	46,416,515	4,003,610	9.4	421	456	35	8.3
Total Government	**57,290**	**57,976**	**686**	**1.2**	**$ 477,394,791**	**$ 504,559,253**	**$ 27,164,462**	**5.7**	**$ 641**	**$ 669**	**$28**	**4.4**
Federal Government	8,283	8,041	-242	-2.9	101,546,378	101,588,682	42,304	0.0	943	972	29	3.0
State Government	14,380	14,419	39	0.3	126,175,222	127,680,669	1,505,447	1.2	675	681	6	0.9
Local Government	34,627	35,516	889	2.6	249,673,191	275,289,902	25,616,711	10.3	555	596	42	7.5

Note: Preliminary.

[a]North American Industry Classification System.

[b]Corporate officer received executive "salary" of over $8 million.

Source: Quarterly Census of Employment and Wages, developed through a cooperative program between Research & Planning and the U.S. Bureau of Labor Statistics.

Extract Date: January 2006

jobs or 0.1%). Private hospitals added 138 jobs (5.1%) and nursing & residential care facilities gained 92 jobs (2.1%).

Modest job losses occurred in Agriculture, Forestry, Fishing, & Hunting, Information, Finance & Insurance, and Federal Government.

Employment and Wages by County

As shown in Table 4 (see page 10), employment increased in all but two of Wyoming's 23 counties during the third quarter.

Campbell County added 2,078 jobs or 9.6%. Rapid employment growth occurred in Mining (including oil & gas); Construction, Transportation & Warehousing; and Administrative & Waste Services. More modest growth was seen in Manufacturing, Retail Trade, Accommodation & Food Services, and Government.

In third quarter, Sweetwater County posted a gain of 1,336 jobs or 6.4%. Mining; Construction; Manufacturing; Transportation & Warehousing; and Real Estate & Rental & Leasing all saw notable employment increases. Slight job losses occurred in Health Care & Social Assistance and Accommodation & Food Services.

Table 5 (see page 11) shows that Natrona County added 657 jobs (1.8%) in third quarter. Mining grew by 422 jobs or 13.2% and Accommodation & Food Services added 170 jobs (5.5%). Administrative & Waste Services employment fell by 156 jobs or 9.0% because of layoffs by telemarketing firms.

Table 4: Wyoming Average Monthly Employment, Total Payroll, and Average Weekly Wage for Third Quarter by County, 2004 and 2005

County	Average Monthly Employment Third Quarter 2004	2005	Change No.	%	Total Payroll Third Quarter 2004	2005	Change Amount	%	Average Weekly Wage Third Quarter 2004	2005	Change Amt.	%
Total	**255,078**	**263,315**	**8,237**	**3.2**	**$1,958,379,343**	**$ 2,185,433,747**	**$227,054,404**	**11.6**	**$ 591**	**$ 638**	**$ 48**	**8.1**
Albany	16,664	16,810	146	0.9	$ 112,430,753	$ 112,737,544	$306,791	0.3	$ 519	$ 516	-3	-0.6
Big Horn	4,400	4,539	138	3.1	30,759,617	34,769,035	4,009,418	13.0	538	589	52	9.6
Campbell	21,604	23,682	2,078	9.6	224,182,768	255,414,607	31,231,839	13.9	798	830	31	3.9
Carbon	6,548	6,754	206	3.1	43,846,871	48,871,005	5,024,134	11.5	515	557	42	8.1
Converse	4,502	4,771	269	6.0	34,177,775	38,546,054	4,368,279	12.8	584	622	38	6.4
Crook	2,238	2,270	32	1.4	14,508,951	15,550,539	1,041,588	7.2	499	527	28	5.7
Fremont	14,894	15,252	358	2.4	96,896,286	106,879,740	9,983,454	10.3	500	539	39	7.7
Goshen	3,887	3,899	12	0.3	22,560,720	23,839,414	1,278,694	5.7	446	470	24	5.3
Hot Springs	1,899	1,904	5	0.2	10,308,241	11,534,967	1,226,726	11.9	417	466	49	11.6
Johnson	3,185	3,381	196	6.2	18,431,593	21,456,426	3,024,833	16.4	445	488	43	9.7
Laramie	39,983	41,030	1,047	2.6	309,635,159	338,356,664	28,721,505	9.3	596	634	39	6.5
Lincoln	6,007	6,002	-5	-0.1	45,076,650	46,716,701	1,640,051	3.6	577	599	21	3.7
Natrona	35,954	36,612	657	1.8	283,908,552	317,509,313	33,600,761	11.8	607	667	60	9.8
Niobrara	751	758	7	1.0	3,885,163	4,141,294	256,131	6.6	398	420	22	5.6
Park	14,101	14,316	215	1.5	90,454,654	97,835,191	7,380,537	8.2	493	526	32	6.5
Platte	3,304	3,266	-37	-1.1	24,145,853	23,702,762	-443,091	-1.8	562	558	-4	-0.7
Sheridan	12,006	12,214	207	1.7	81,922,447	87,837,096	5,914,649	7.2	525	553	28	5.4
Sublette	3,347	3,987	640	19.1	25,198,243	37,170,563	11,972,320	47.5	579	717	138	23.8
Sweetwater	20,752	22,089	1,336	6.4	198,273,195	229,460,760	31,187,565	15.7	735	799	64	8.7
Teton	19,497	19,976	479	2.5	142,683,646	167,051,776	24,368,130	17.1	563	643	80	14.3
Uinta	8,725	9,254	529	6.1	61,465,973	72,854,592	11,388,619	18.5	542	606	64	11.7
Washakie	3,741	3,887	146	3.9	26,985,652	28,396,189	1,410,537	5.2	555	562	7	1.3
Weston	2,178	2,209	31	1.4	13,944,651	14,017,169	72,518	0.5	492	488	-4	-0.9
Nonclassified[a]	**4,910**	**4,454**	**-456**	**-9.3**	**42,695,930**	**50,784,346**	**8,088,416**	**18.9**	**669**	**877**	**208**	**31.1**

Note: Preliminary.

[a]The employer may be located statewide or in more than one county.

Source: Quarterly Census of Employment and Wages, developed through a cooperative program between Research & Planning and the U.S. Bureau of Labor Statistics.

Extract Date: January 2006

Laramie County grew by 1,047 jobs or 2.6% in third quarter (see Table 6, page 12). Local Government (including public schools and hospitals) added 414 jobs or 7.4% and Retail Trade gained 227 jobs or 4.1%. Notable job gains also occurred in Construction (119 jobs or 4.2%), Health Care & Social Assistance (100 jobs or 3.2%), and Professional & Technical Services (79 jobs or 5.5%). Employment fell in Administrative & Waste Services and Information.

Sublette County was the fastest growing county in third quarter, adding 640 jobs or 19.1%. Mining (including oil & gas) and Construction were responsible for well over half of the new jobs. Other job gains were spread throughout many industries such as Retail Trade; Transportation & Warehousing; Information; Professional & Technical Services; and Accommodation & Food Services.

Employment in Uinta County increased by 529 jobs or 6.1% in third quarter. Mining and Construction experienced the largest job gains, but growth also was seen in Manufacturing, Wholesale Trade, Finance & Insurance, and Accommodation & Food Services.

Teton County added 479 jobs or 2.5%. Construction; Arts, Entertainment & Recreation; and Accommodation & Food Services gained the most new jobs. Growth also was seen in Real Estate & Rental & Leasing; Professional & Technical Services;

Table 5: Natrona County Average Monthly Employment, Total Payroll, and Average Weekly Wage for Third Quarter by Industry, 2003 and 2004

Industry Title and NAICS[a] Sector	Average Monthly Employment				Total Payroll				Average Weekly Wage			
	Third Quarter		Change		Third Quarter		Change		Third Quarter		Change	
	2003	2004	No.	%	2003	2004	Amount	%	2003	2004	Amt.	%
Total, All Industries	**34,092**	**35,880**	**1,788**	**5.2**	**$246,345,719**	**$283,524,998**	**$37,179,279**	**15.1**	**$556**	**$608**	**$52**	**9.4**
Total Private (11-99)	**29,268**	**30,984**	**1,716**	**5.9**	**$209,151,399**	**$243,730,195**	**$34,578,796**	**16.5**	**$550**	**$605**	**$55**	**10.1**
Agriculture (11)	124	120	-5	-3.8	555,287	555,646	359	0.1	344	357	14	4.0
Mining (21)	2,562	3,198	636[b]	24.8	29,900,505	40,709,224	10,808,719	36.1	898	979	81	9.1
Utilities (22)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Construction (23)	2,552	2,605	53[c]	2.1	20,303,724	22,239,588	1,935,864	9.5	612	657	45	7.3
Manufacturing (31-33)	1,492	1,622	129	8.7	12,106,396	16,005,801	3,899,405[d]	32.2	624	759	135	21.7
Wholesale Trade (42)	2,163	2,366	204	9.4	20,911,156	23,802,607	2,891,451	13.8	744	774	30	4.0
Retail Trade (44-45)	4,615	4,893	278	6.0	24,646,889	26,806,428	2,159,539	8.8	411	421	11	2.6
Transportation & Warehousing (48-49)	918	954	36	3.9	7,647,367	8,860,210	1,212,843	15.9	641	714	74	11.5
Information (51)	514	572	58	11.3	3,700,064	4,419,379	719,315	19.4	553	594	41	7.3
Finance & Insurance (52)	1,026	1,035	9	0.9	10,141,473	10,370,171	228,698	2.3	760	771	10	1.4
Real Estate & Rental & Leasing (53)	796	854	59	7.4	5,648,062	6,374,363	726,301	12.9	546	574	28	5.1
Professional & Technical Services (54)	1,191	1,255	64	5.4	10,411,485	12,061,859	1,650,374	15.9	672	739	67	9.9
Mgmt. of Companies & Enterprises (55)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Administrative & Waste Services (56)	2,099	1,724	-376[e]	-17.9	9,324,330	8,419,833	-904,497	-9.7	342	376	34	10.0
Educational Services (61)	98	100	2	2.0	378,761	379,998	1,237	0.3	298	293	-5	-1.7
Health Care & Social Assistance (62)	4,280	4,515	235	5.5	34,180,552	40,219,390	6,038,838	17.7	614	685	71	11.5
Arts, Entertainment, & Recreation (71)	468	569	101	21.6	1,375,509	1,893,787	518,278	37.7	226	256	30	13.2
Accommodation & Food Services (72)	2,966	3,074	108	3.6	7,856,608	8,956,813	1,100,205	14.0	204	224	20	10.0
Other Services (81)	1,302	1,355	52	4.0	8,487,959	8,766,814	278,855	3.3	501	498	-4	-0.7
Total Government	**4,825**	**4,896**	**71**	**1.5**	**$37,194,320**	**$39,794,803**	**$2,600,483**	**7.0**	**$593**	**$625**	**$32**	**5.4**
Federal Government	715	743	27	3.8	9,451,153	11,395,798	1,944,645	20.6	1,016	1,180	164	16.1
State Government	709	700	-10	-1.4	6,570,489	6,548,455	-22,034	-0.3	713	720	7	1.0
Local Government	3,400	3,454	54	1.6	21,172,678	21,850,550	677,872	3.2	479	487	8	1.6

[a]North American Industry Classification System.

[b]Several new employers. One large employer provided a more detailed breakout.

[c]Large employer breakout in heavy & civil engineering construction (237) from Lincoln County to Natrona County. Large employer in heavy & civil engineering construction (237) from Natrona County to Sublette County.

[d]Large bonus payment in this sector.

[e]Several employer reclassifications and breakouts from administrative & support services (561) to various subsectors and counties.

ND - Not discloseable due to confidentiality of information.

Management of Companies & Enterprises; and Educational Services. Jobs were lost in Manufacturing; Transportation & Warehousing; Information; and Administrative & Waste Services.

In third quarter, Fremont County gained 358 jobs or 2.4%. Healthy growth was seen in Mining (including oil & gas); Wholesale Trade; Real Estate & Rental & Leasing; and Accommodation & Food Services. Modest job losses occurred in Utilities, Manufacturing, and Administrative & Waste Services.

Platte County lost 37 jobs or 1.1% in third quarter. Slight job losses were spread across many industries, including Agriculture, Manufacturing, Retail Trade, and Transportation & Warehousing. Modest job gains occurred in Construction, Wholesale Trade, and Information.

In Lincoln County, employment fell by 5 jobs or 0.1%. Job losses in Construction were partially offset by gains in Local Government; Transportation & Warehousing; and Accommodation & Food Services.

In summary, employment increased at a faster-than-average pace during third quarter 2005. Job gains appeared in many industries and in almost every county of the state. The largest gains were seen in Mining and Construction.

Table 6: Laramie County Average Monthly Employment, Total Payroll, and Average Weekly Wage for Third Quarter by Industry, 2003 and 2004

	Average Monthly Employment				Total Payroll				Average Weekly Wage			
	Third Quarter		Change		Third Quarter		Change		Third Quarter		Change	
Industry Title and NAICS[a] Sector	2003	2004	No.	%	2003	2004	Amount	%	2003	2004	Amt.	%
Total, All Industries	**39,620**	**39,994**	**374**	**0.9**	**$294,967,117**	**$309,779,356**	**$14,812,239**	**5.0**	**$573**	**$596**	**23**	**4.0**
Total Private (11-99)	**27,743**	**27,998**	**255**	**0.9**	**$182,312,013**	**$190,877,851**	**$8,565,838**	**4.7**	**$506**	**$524**	**$19**	**3.7**
Agriculture (11)	169	165	-4	-2.4	947,668	991,668	44,000	4.6	432	463	31	7.2
Mining (21)	36	74	38	106.5	354,147	784,717	430,570	121.6	764	819	56	7.3
Utilities (22)	114	118	3	2.9	1,617,756	1,654,503	36,747	2.3	1,088	1,082	-7	-0.6
Construction (23)	2,768	2,801	32	1.2	20,981,276	21,635,476	654,200	3.1	583	594	11	1.9
Manufacturing (31-33)	1,545	1,578	33	2.1	14,730,915	15,565,104	834,189	5.7	733	759	25	3.5
Wholesale Trade (42)	718	700	-19	-2.6	6,606,480	6,693,636	87,156	1.3	707	736	28	4.0
Retail Trade (44-45)	5,581	5,492	-89	-1.6	29,686,030	30,236,958	550,928	1.9	409	423	14	3.5
Transportation & Warehousing (48-49)	1,372	1,647	275	20.0	9,520,272	11,707,747	2,187,475	23.0	534	547	13	2.4
Information (51)	1,076	1,046	-29	-2.7	9,741,707	9,880,251	138,544	1.4	697	726	30	4.3
Finance & Insurance (52)	1,554	1,506	-49	-3.1	14,142,600	13,471,193	-671,407	-4.7	700	688	-12	-1.7
Real Estate & Rental & Leasing (53)	450	486	36	8.0	2,788,787	3,255,261	466,474	16.7	476	515	39	8.1
Professional & Technical Services (54)	1,338	1,389	50	3.8	13,790,235	14,524,043	733,808	5.3	793	805	12	1.5
Mgmt. of Companies & Enterprises (55)	199	166	-33	-16.6	1,661,367	1,599,304	-62,063	-3.7	642	741	99	15.4
Administrative & Waste Services (56)	2,090	1,689	-401	-19.2	10,572,962	9,404,282	-1,168,680	-11.1	389	428	39	10.0
Educational Services (61)	88	100	12	14.0	344,832	495,857	151,025	43.8	301	380	79	26.1
Health Care & Social Assistance (62)	2,812	3,081	269	9.6	24,304,785	27,404,819	3,100,034	12.8	665	684	19	2.9
Arts, Entertainment, & Recreation (71)	301	247	-53	-17.7	803,123	801,985	-1,138	-0.1	205	249	44	21.4
Accommodation & Food Services (72)	4,258	4,378	119	2.8	12,598,210	13,514,171	915,961	7.3	228	237	10	4.3
Other Services (81)	1,272	1,335	63	5.0	7,118,861	7,256,876	138,015	1.9	431	418	-12	-2.9
Total Government	**11,877**	**11,996**	**119**	**1.0**	**$112,655,104**	**$118,901,505**	**$6,246,401**	**5.5**	**$730**	**$762**	**$33**	**4.5**
Federal Government	2,624	2,677	53	2.0	31,483,958	33,069,865	1,585,907	5.0	923	950	27	2.9
State Government	3,829	3,760	-70	-1.8	37,988,707	39,433,203	1,444,496	3.8	763	807	44	5.7
Local Government	5,424	5,559	135	2.5	43,182,439	46,398,437	3,215,998	7.4	612	642	30	4.8

[a]North American Industry Classification System.

Quality Improvement in the Quarterly Census of Employment and Wages (QCEW) Program and its Implications for Comparability Over Time

Each year, approximately one-third of employers covered by Unemployment Insurance (UI) in Wyoming are contacted by mail questionnaire to confirm that they have been assigned to the correct industry category (e.g., Mining, Construction, Manufacturing) based on the North American Industry Classification System (NAICS; U.S. Census Bureau, 2002). If it is found that an employer has changed primary business activity, a different NAICS code is assigned to reflect that change. This is known as a noneconomic code change. Research staff also review employers' NAICS codes if the business is sold, becomes incorporated, or otherwise changes ownership. In this manner, Research & Planning continuously ensures that employers are assigned to the correct industry category. However, these noneconomic code changes also make it difficult for data users to make direct comparisons across years. Sometimes, large employers may move from one NAICS sector to another. For example, in Table 3 (see page 9), several employers were moved into Manufacturing from Mining and Construction, which explains part of the employment increase in Manufacturing.

In a separate initiative to increase data quality, the Quarterly Census of Employment and Wages unit has contacted many employers with "nonclassified" geographic codes in order to place them within appropriate counties. This data quality effort has resulted in a significant decrease in employment in the "nonclassified" geographic designation, and corresponding employment increases in many counties throughout the state. While the long-run result will be higher-quality data, initially some of the employment increases at the county level may simply be the result of more accurate reporting, rather than actual increases in the number of jobs in those counties.

QCEW data is usually published about six to nine months after the end of the reference quarter. The deadline for employers to file their quarterly unemployment insurance contributions report is one month after the end of the quarter (third quarter ended September 30, and the taxes were due on October 31). Then the data must be imaged, edited, and cleaned-up. Missing reports must be researched and errors corrected. Despite the time lag, QCEW provides employment and wage data at the county and industry level that is not available from any other source.

Each quarter, QCEW data is revised to reflect the receipt of late reports and corrections from employers. At the total level, these revisions are usually quite small. For example, when data for third quarter 2004 was first published in April 2005 Trends, total employment was shown in the tables as 254,916, but the tables accompanying this article show third quarter 2004 total employment as 255,078, a revision of 162 jobs or 0.1%.

References

U.S. Census Bureau. (2002, September 10). 2002 NAICS Codes and Titles. Retrieved December 18, 2003, from http://www.census.gov/epcd/naics02/naicod02.htm

Industries and Occupations Projected to Grow or Decline in the Short Term and Over the Next Decade

Douglas Leonard, Research Analyst

The previous article draws upon industry, payroll, and locality employment change published each quarter as the data become available. Persistent patterns of employment change from these quarterly data are also identified as *Growing and Declining Industry Employment* (Bureau of Labor Statistics, 2005). Quarterly updates may be found at http://doe.state.wy.us/LMI/G_DInd/G_D_Industries.htm.

In this article, we use the Customized Staffing Pattern tool at http://doe.state.wy.us/LMI/staffingpatterns2003/staffingpatterns2003.htm to identify how persistent patterns of industry employment growth most likely affect change at the occupational level. This article also includes information for the period 2003-2005 and longer-term projections for 2002-2012 by industry and occupation.

Employment change in Wyoming's economy can be viewed from a variety of perspectives. The perspectives presented in this article include recent events in the job market (Leonard & Wen, 2005) and projections for second quarter 2003 through second quarter 2005 (2003Q2-2005Q2; Bullard & Leonard, 2004b. Employment change for each period was matched against Research & Planning's Customized Staffing Pattern matrix (Glover, 2005) to estimate occupational employment change.

Current Trend Conditions

Table 1 (see page 16) illustrates recent conditions in the Wyoming job market by displaying the fastest growing industries with 100 or more workers in 2004Q3. Industries shown in the table are ranked by the number of jobs added. Table 1 shows that the 17 growing industries comprised 21.1% of Wyoming's employment in 2004Q3 and accounted for 5,082 additional jobs in Wyoming between 2003Q3 and 2004Q3. In terms of numeric change, growing industries include educational services (1,770 jobs), support activities for mining (1,552 jobs), and ambulatory health care services (461 jobs).

An analysis of job growth by occupation (top 50 occupations) using the growing industries data in Table 1 is shown in Table 2 (see page 17). Teacher assistants (188 jobs), helpers-extraction workers (186 jobs), elementary school teachers (175 jobs) and roustabouts, oil & gas (168 jobs) posted the largest job gains between 2003Q3 and 2004Q3. The top 50 occupations identified in the table accounted for 74.0% of the occupational growth. A more detailed breakout showing all related occupation growth is located online at http://doe.state.wy.us/LMI/Occasional/No4/append.htm.

Current Short-Term Projections

Table 3 (see page 18) summarizes the forecasted short-term employment growth projections from 2003Q2 to 2005Q2. The projections were prepared in early 2004. Actual growth rates in several industries (e.g., support activities for mining) have exceeded the forecasted growth in the short-term projections due, at least in

Table 1: Growing Industries in Wyoming, 2004Q3[a]

NAICS[b]	Industry Code and Title	Employment	% of Total Employment	Over-the-Year Job Growth
611	Educational services	21,683	8.5%	1,770
213	Support activities for mining	9,777	3.8%	1,552
621	Ambulatory health care services	7,773	3.0%	461
423	Merchant wholesalers, durable goods	4,479	1.8%	257
532	Rental & leasing services	1,851	0.7%	206
551	Mgmt. of companies & enterprises	766	0.3%	197
493	Warehousing & storage	686	0.3%	195
448	Clothing & clothing accessories stores	1,557	0.6%	86
311	Food manufacturing	680	0.3%	70
446	Health & personal care stores	890	0.3%	52
492	Couriers & messengers	700	0.3%	45
333	Machinery manufacturing	374	0.1%	39
443	Electronics & appliance stores	732	0.3%	36
323	Printing & related support activities	401	0.2%	33
562	Waste mgmt. & remediation services	571	0.2%	32
115	Ag. & forestry support activities	419	0.2%	29
425	Electronic markets, agents, & brokers	397	0.2%	22
Total Growing Industries			**21.1%**	**5,082**
All Other Industries		**201,180**	**78.9%**	
Total All Industries		**254,916**	**100.0%**	

[a]A growing industry is defined as an industry which had 100 or more employees in 2004Q3 and experienced employment growth in excess of 5% from 2003Q2 to 2004Q2 and from 2003Q3 to 2004Q3.
[b]North American Industry Classification System.

part, to continuing high commodity prices and rapidly increasing demand for natural gas (Energy Information Agency, 2005).

Table 4 (see page18) illustrates the forecasted statewide occupational growth for all industries, including the growth industries shown in Table 3. The occupations shown are the top 20 by expected change in occupational employment from 2003Q2 to 2005Q2. Several Construction occupations appear, such as laborers (215 jobs), carpenters (180 jobs), and electricians (108 jobs). Table 4 represents a slightly different mix of occupations than those in Table 2 (see page 17). Growing industries data (see Table 2) show more growth in Mining-related occupations than do the occupations contained in Table 4.

Long-Term Projections

Table 5 (see page 19) shows the 10 industries expected to add the most jobs over the long term (2002-2012). Considerable emphasis is placed on the Construction industry; both specialty trades contractors and heavy & civil engineering construction appear in the

(Text continued on page 19)

Table 2: Wyoming's Top 50 Private Sector Occupations With the Greatest Occupational Employment Growth (Among Growing Industries), 2004Q3

Standard Occupational Classification (SOC) Code and Title		Over-the-Year Occupational Employment Growth	% of Total Occupational Employment Growth
25-9041	Teacher assistants	188	4.0%
47-5081	Helpers--extraction workers	186	3.9%
25-2021	Elementary school teachers, except special education	175	3.7%
25-2031	Secondary school teachers, except special & vocational education	168	3.5%
47-5071	Roustabouts, oil & gas	162	3.4%
43-6014	Secretaries, except legal, medical, & executive	150	3.2%
53-3032	Truck drivers, heavy & tractor-trailer	141	3.0%
37-2011	Janitors & cleaners, except maids & housekeeping cleaners	127	2.7%
11-1021	General & operations managers	117	2.5%
41-2031	Retail salespersons	113	2.4%
53-3033	Truck drivers, light or delivery services	101	2.1%
47-5013	Service unit operators, oil, gas, & mining	100	2.1%
47-5099	Extraction workers, all other	89	1.9%
49-9042	Maintenance & repair workers, general	80	1.7%
25-2022	Middle school teachers, except special & vocational education	79	1.7%
47-5012	Rotary drill operators, oil & gas	79	1.7%
43-3031	Bookkeeping, accounting, & auditing clerks	76	1.6%
53-7062	Laborers & freight, stock, & material movers, hand	76	1.6%
25-3999	Teachers, primary, secondary, & adult, all other	71	1.5%
47-1011	First-line sup./mgrs. of construction trades & extraction workers	65	1.4%
53-3022	Bus drivers, school	65	1.4%
43-9061	Office clerks, general	61	1.3%
41-4012	Sales reps., wholesale & mfg., exc. technical & scientific products	58	1.2%
53-7073	Wellhead pumpers	58	1.2%
47-2073	Operating engineers & other construction equipment operators	54	1.1%
29-1111	Registered nurses	49	1.0%
47-5011	Derrick operators, oil & gas	49	1.0%
21-1093	Social & human service assistants	43	0.9%
49-3042	Mobile heavy equipment mechanics, except engines	43	0.9%
47-5031	Explosives workers, ordnance handling experts, & blasters	42	0.9%
43-4171	Receptionists & information clerks	40	0.8%
41-1011	First-line supervisors/managers of retail sales workers	39	0.8%
51-4121	Welders, cutters, solderers, & brazers	39	0.8%
41-2011	Cashiers	38	0.8%
43-6011	Executive secretaries & administrative assistants	38	0.8%
41-2021	Counter & rental clerks	35	0.7%
43-5081	Stock clerks & order fillers	35	0.7%
35-2012	Cooks, institution & cafeteria	34	0.7%
41-4011	Sales reps., wholesale & mfg., technical & scientific products	33	0.7%
25-2041	Special ed. teachers, preschool, kindergarten, & elementary school	31	0.7%
43-1011	First-line sup./mgrs. of office & administrative support workers	31	0.7%
47-2111	Electricians	30	0.6%
51-9061	Inspectors, testers, sorters, samplers, & weighers	30	0.6%
27-2022	Coaches & scouts	29	0.6%
31-9091	Dental assistants	28	0.6%
43-4151	Order clerks	28	0.6%
49-3031	Bus & truck mechanics & diesel engine specialists	28	0.6%
51-4041	Machinists	28	0.6%
11-9032	Education administrators, elementary & secondary school	27	0.6%
43-6013	Medical secretaries	27	0.6%
All Other Growing Occupations		1,234	26.0%

Table 3: Wyoming's Top 10 Industries With the Greatest Forecasted Short-Term Employment Growth, 2003 - 2005

NAICS[a] Industry Code and Title		Job Growth 2003 - 2005	% of Total Job Growth
238	Specialty Trade Contractors	761	8.4%
611	Educational Services	666	7.4%
213	Support Activities for Mining	661	7.3%
541	Professional, Scientific, & Technical Services	554	6.1%
621	Ambulatory Health Care Services	545	6.0%
722	Food Services & Drinking Places	508	5.6%
561	Administrative & Support Services	446	4.9%
236	Construction of Buildings	440	4.9%
237	Heavy & Civil Engineering Construction	323	3.6%
522	Credit Intermediation & Related Activities	298	3.3%
Other Growing Industries		3,849	42.5%
Total Employment Growth in Growing Industries		**9,051**	**100.0%**

[a]North American Industry Classification System.

Table 4: Wyoming's Top 20 Private Sector Occupations With the Greatest Forecasted Short-Term Occupational Employment Growth (Among All Industries), 2003 - 2005

Standard Occupational Classification (SOC) Code and Title		Occupational Employment Growth 2003 - 2005	% of Total Occupational Employment Growth
47-2061	Construction laborers	215	2.6%
11-1021	General & operations managers	209	2.6%
43-3031	Bookkeeping, accounting, & auditing clerks	197	2.4%
47-2031	Carpenters	180	2.2%
43-6014	Secretaries, except legal, medical, & executive	178	2.2%
37-2011	Janitors & cleaners, except maids & housekeeping cleaners	163	2.0%
41-2031	Retail salespersons	151	1.9%
35-3031	Waiters & waitresses	138	1.7%
53-3032	Truck drivers, heavy & tractor-trailer	138	1.7%
35-3021	Combined food preparation & serving workers, including fast food	120	1.5%
47-1011	First-line sup./mgrs. of construction trades & extraction workers	117	1.4%
29-1111	Registered nurses	115	1.4%
47-2111	Electricians	108	1.3%
43-9061	Office clerks, general	107	1.3%
47-2073	Operating engineers & other construction equipment operators	101	1.2%
43-6011	Executive secretaries & administrative assistants	94	1.2%
37-2012	Maids & housekeeping cleaners	91	1.1%
25-9041	Teacher assistants	88	1.1%
49-9042	Maintenance & repair workers, general	88	1.1%
47-5081	Helpers--extraction workers	85	1.0%
Subtotal Top 20 Growing Occupations		2,683	33.1%
All Other Growing Occupations		5,431	66.9%

list. In comparing Table 5 with Tables 1 (see page 16) and 3 (see page18), some of the same industries appear. While the magnitude of forecasted changes may not match actual changes, this indicates the expected directional change for most industries is similar to actual results.

Table 6 (see page 20) shows the forecasted long-term change in occupational employment in all of Wyoming's industries statewide. The 50 occupations in Table 6 represent the occupations with the greatest numeric growth, or 54.9% of the expected occupational employment growth between 2002 and 2012. The demand for skilled tradespeople (e.g., carpenters, electricians, operating engineers, plumbers, and occupations requiring long-term on-the-job training) is expected to increase substantially (adding 2,000+ jobs) during the forecast period. In addition, the expected demand for people working in occupations associated with Wyoming's tourism and hospitality industries (e.g., waiters, food preparation workers, maids) is also expected to increase markedly by 2012 (adding 2,300+ jobs). The demand for nurses and nursing aides is also expected to increase substantially from 2002 to 2012 (adding 1,400+ jobs). While selected higher-skilled occupations display positive numeric growth, the market will remain dominated by occupations requiring only short-term and moderate-term on-the-job training through 2012.

Detailed forecasts for all disclosable industries are available at http://doe.state.wy.us/LMI/proj2004/Wyoming_Report%203Dig%202012.pdf.

(Text continued on page 21)

Table 5: Wyoming's Top 10 Industries With the Greatest Forecasted Long-Term Employment Growth, 2002 - 2012

NAICS[a]	Industry Code and Title	Job Growth 2002 - 2012	% of Total Job Growth
238	Specialty Trade Contractors	3,701	9.4%
621	Ambulatory Health Care Services	2,843	7.2%
541	Professional, Scientific, & Technical Services	2,545	6.4%
722	Food Services & Drinking Places	2,173	5.5%
213	Support Activities for Mining	2,074	5.2%
611	Educational Services	2,033	5.1%
721	Accommodation	1,856	4.7%
561	Administrative & Support Services	1,758	4.4%
624	Social Assistance	1,439	3.6%
237	Heavy & Civil Engineering Construction	1,295	3.3%
Other Growing Industries		**17,806**	**45.1%**
Total Employment Growth in Growing Industries		**39,523**	**100.0%**

[a]North American Industry Classification System.

Table 6: Wyoming's Top 50 Private Sector Occupations With the Greatest Forecasted Long-Term Occupational Employment Growth (Among All Industries), 2002 - 2012

Standard Occupational Classification (SOC) Code and Title	Occupational Employment Growth 2002 - 2012	% of Total Occupational Employment Growth
41-2031 Retail salespersons	1,077	3.0%
11-1021 General & operations managers	901	2.5%
43-3031 Bookkeeping, accounting, & auditing clerks	846	2.4%
47-2061 Construction laborers	802	2.3%
43-6014 Secretaries, except legal, medical, & executive	738	2.1%
35-3031 Waiters & waitresses	681	1.9%
53-3032 Truck drivers, heavy & tractor-trailer	664	1.9%
37-2011 Janitors & cleaners, except maids & housekeeping cleaners	657	1.8%
37-2012 Maids & housekeeping cleaners	638	1.8%
29-1111 Registered nurses	611	1.7%
47-2031 Carpenters	546	1.5%
35-3021 Combined food preparation & serving workers, including fast food	542	1.5%
47-2111 Electricians	491	1.4%
43-9061 Office clerks, general	452	1.3%
31-1012 Nursing aides, orderlies, & attendants	446	1.3%
49-9042 Maintenance & repair workers, general	431	1.2%
47-2073 Operating engineers & other construction equipment operators	430	1.2%
47-1011 First-line sup./mgrs. of construction trades & extraction workers	407	1.1%
43-6011 Executive secretaries & administrative assistants	398	1.1%
43-4171 Receptionists & information clerks	358	1.0%
41-2011 Cashiers	353	1.0%
53-7062 Laborers & freight, stock, & material movers, hand	350	1.0%
53-3033 Truck drivers, light or delivery services	326	0.9%
49-3023 Automotive service technicians & mechanics	315	0.9%
25-9041 Teacher assistants	312	0.9%
39-9011 Child care workers	307	0.9%
37-3011 Landscaping & groundskeeping workers	306	0.9%
41-1011 First-line supervisors/managers of retail sales workers	296	0.8%
47-5081 Helpers--extraction workers	268	0.8%
21-1093 Social & human service assistants	261	0.7%
43-5081 Stock clerks & order fillers	261	0.7%
43-1011 First-line sup./mgrs. of office & administrative support workers	259	0.7%
47-5071 Roustabouts, oil & gas	259	0.7%
47-2152 Plumbers, pipefitters, & steamfitters	255	0.7%
41-4012 Sales reps., wholesale & mfg., exc. technical & scientific products	233	0.7%
35-2014 Cooks, restaurant	230	0.6%
35-3011 Bartenders	229	0.6%
51-4121 Welders, cutters, solderers, & brazers	229	0.6%
13-2011 Accountants & auditors	226	0.6%
35-2011 Cooks, fast food	217	0.6%
47-2051 Cement masons & concrete finishers	214	0.6%
25-2021 Elementary school teachers, except special education	204	0.6%
47-3012 Helpers--carpenters	200	0.6%
35-1012 First-line sup./mgrs. of food preparation & serving workers	196	0.5%
25-2031 Secondary school teachers, except special & vocational education	193	0.5%
43-6013 Medical secretaries	193	0.5%
43-4051 Customer service representatives	192	0.5%
29-2061 Licensed practical & licensed vocational nurses	191	0.5%
31-1011 Home health aides	186	0.5%
47-2141 Painters, construction & maintenance	179	0.5%
Subtotal Growing Occupations	19,377	54.4%
All Other Growing Occupations	16,084	45.1%

References

Bullard, D. & Leonard, D. (2004a). Long-term projections database. [Unpublished data].

Bullard, D. & Leonard, D. (2004b). Short-term projections database. [Unpublished data].

Glover, W. (2005). Wyoming occupational staffing patterns. [Unpublished data].

Leonard, D. & Wen, S. (2005). *Growing industries in 2004Q3*. Retrieved March 28, 2005 from http://doe.state.wy.us/LMI/G_DInd/growing_2004_q3.htm

United States Department of Energy, Energy Information Agency. (2005). *Annual energy outlook 2005 with projections to 2025*. Retrieved April 4, 2005, from http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2005).pdf

United States Department of Labor, Bureau of Labor Statistics. (2005). *Quarterly census of employment and wages home page*. Retrieved April 4, 2005, from http://www.bls.gov/cew/#overview

Industries and Occupations With a Demand for Skilled Workers

Tony Glover, Senior Research Analyst

This article was written to address the question "Which industries and occupations have a demand for skilled workers?" Opinions differ as to what would be defined as a skilled worker. Because these perspectives vary from situation to situation, R&P elected to display education/experience level requirements for growth occupations and allow the reader to evaluate which levels of education and experience define skilled workers. The levels range from short-term on-the-job-training to doctoral degree and first professional degree (e.g., lawyers, doctors). The method discussed does not take into consideration replacement need due to turnover or retirements. These limitations are addressed in more detail in "Registered Nurses in Wyoming: Do Occupational Projections Accurately Depict the Projected Employment Change?" (see page 47). Lastly, the data sets combined to create the tables, figure, and definitions of the data items such as *short-term on-the-job-training* are documented at the end of this article.

The primary tables: Table 1 (see page 24), 4 (see page 32), 5 (see page 33), and 6 (see page 33) present forecasted employment by education/experience level requirements using two projection periods and two industry compositions. Tables 1 and 4 are forecasted employment from long-term projections (Bullard & Leonard, 2004) and represent a base year of 2002 and projected year of 2012. Table 1 includes data for all industries while Table 4 includes data for the 10 industries with the greatest forecasted long-term employment growth. Tables 5 and 6 follow the same conventions but represent short-term forecasted employment with a base year of 2003 and projected year of 2005. Table 5 contains all industries and Table 6 displays the 10 industries with the greatest forecasted short-term employment growth. For clarity, the tables and figure are listed below by forecast period and industry composition.

The data reveal that the various combinations of forecast period and industry composition produce similar results with respect to the associated

	Forecast Period	
Industries Included	**Long-Term 2002 - 2012**	**Short-Term 2003 - 2005**
All Industries	Tables 1, page 24; 2, page 26: 3, page 29 Figure, page 25	Table 5, page 33
Fastest Growing Industries	Table 4, page 32	Table 6, page 33
3-Digit NAICS Included	238, 621, 541, 722, 213, 611, 721, 561, 624, 237	238, 611, 213, 541, 621, 722, 561, 236, 237, 522

education/experience level requirements. Because of these similarities, the balance of this article focuses on developing greater knowledge about longer-term trends (as described in Table 1).

Targeted Demand

A review of the base 2002 and projected 2012 employment in Table 1 reveals that the mix of jobs by education/experience will remain nearly the same. Approximately 37% of jobs in Wyoming in 2002 (37.6%) and the projected year 2012 (37.2%) will require short-term on-the-job-training as the minimum qualification. An additional 4.0% and 4.1%, respectively, will require a postsecondary vocational award and 8.9% and 8.7%, respectively, will require a bachelor's degree or higher.

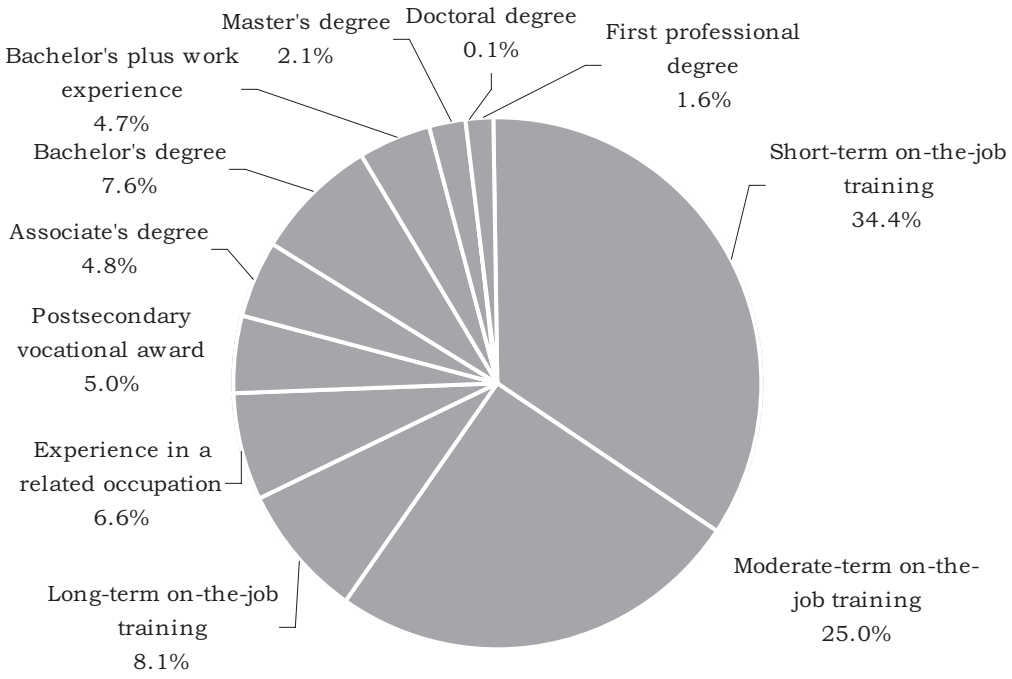
In the long-term projections from 2002 to 2012 (Bullard & Leonard, 2004), Wyoming is expected to add 37,588 total jobs or 3,759 on an annual average basis (see Table 1). The percentage of jobs added annually by education/experience level are shown in the Figure (see page 25). The distribution of jobs by education/experience required is not projected to change much over the next decade. Employment growth will occur, but the jobs that are added are similar to the base year employment. Therefore, of the average expected 3,759 new jobs added annually, approximately three-fourths (2,786) have an education/experience minimum requirement ranging from on-the-job training to experience in a related occupation.

Table 2 (see page 26) presents the 10 occupations with the greatest net employment growth within each education/experience level. The total from the first section in Table 2 is the same as the first row of data in Table 1. The first 10 rows show the occupations requiring short-term on-the-job training projected to add the greatest number of jobs over the next decade. For example, retail salespersons (Standard Occupational Classification [SOC] 41-2031) will add 1,078 jobs (8.3%) of the jobs requiring short-term, on-the-job training. Registered nurses (SOC 29-1111) and other healthcare related occupations dominate the anticipated employment growth of occupations requiring an associate's degree.

Table 1: Forecasted Change in Long-Term Employment by Typical Education/Experience Level for All Industries in Wyoming, 2002 - 2012

Typical Education/ Experience Level	Employment 2002	%	2012	%	Job Growth 2002 - 2012	Annual Additions	% of Total Job Growth
Short-term on-the-job training	88,590	37.6%	101,536	37.2%	12,945	1,295	34.4%
Moderate-term on-the-job training	52,381	22.2%	61,785	22.6%	9,404	940	25.0%
Long-term on-the-job training	19,686	8.4%	22,735	8.3%	3,049	305	8.1%
Experience in a related occupation	16,838	7.1%	19,304	7.1%	2,466	247	6.6%
Postsecondary vocational award	9,457	4.0%	11,336	4.1%	1,879	188	5.0%
Associate's degree	9,081	3.9%	10,900	4.0%	1,819	182	4.8%
Bachelor's degree	21,048	8.9%	23,908	8.7%	2,861	286	7.6%
Bachelor's plus work experience	11,380	4.8%	13,134	4.8%	1,754	175	4.7%
Master's degree	4,896	2.1%	5,676	2.1%	780	78	2.1%
Doctoral degree	183	0.1%	217	0.1%	34	3	0.1%
First professional degree	2,118	0.9%	2,715	1.0%	597	60	1.6%
Total	**235,658**	**100.0%**	**273,246**	**100.0%**	**37,588**	**3,759**	**100.0%**

Figure 1: Distribution of Employment Growth by Typical Education/Experience Level for All Industries in Wyoming, 2012



The final method for presenting data most appropriately addresses the question, "Which industries and occupations have a demand for skilled workers?" Table 3 (see page 29) shows long-term projections of educational and experience requirements by industry. The three industries most reliant on employees with postsecondary education are Information (50.7%), Professional & Business Services (40.7%), and Educational & Health Services (49.3%). On the other hand, only 8.8% of the jobs in Mining require a minimum of postsecondary education or greater, while the jobs in Construction (7.2%) and Leisure & Hospitality (6.6%) are even less likely to rely on postsecondary education.

Glossary of Data Sets and Definitions

The data are drawn from several sources. The first is "Wyoming Staffing Patterns & Wages 2003" available and discussed in greater detail on our website at http://doe.state.wy.us/LMI/staffingpatterns2003/staffingpatterns2003.htm. The U.S. Bureau of Labor Statistics' (BLS) education and experience level by occupation were used to assign the appropriate education/experience level to the occupations (2004, Table I-1, pp. 4-33). Lastly, the industry projections from 2003 to 2005 and 2002 to 2012 presented in "Industries and Occupations Projected to Grow or Decline in the Short Term and Over the Next Decade" on page 15 were used to determine net change in the number of jobs.

Staffing Patterns Defined

Staffing patterns rely on data from several BLS programs, including Wyoming's

(Text continued on page 34)

Table 2: Wyoming's Top 10 Occupations With the Greatest Employment Growth Within Each Typical Education/Experience Level for All Industries, 2002 – 2012

Typical Education/ Experience Level	Standard Occupational Classification (SOC) Code & Title		Employment 2002	Employment 2012	Job Growth 2002 - 2012	Annual Adds.	% of Total Job Growth
Short-term on-the-job training	41-2031	Retail salespersons	7,674	8,752	1,078	108	8.3%
	37-2011	Janitors & cleaners, except maids & housekeepers	4,469	5,162	693	69	5.4%
	35-3031	Waiters & waitresses	5,236	5,919	682	68	5.3%
	37-2012	Maids & housekeeping cleaners	3,534	4,174	640	64	4.9%
	35-3021	Combined food prep. & serving wkrs., incl. fast food	4,972	5,526	554	55	4.3%
	31-1012	Nursing aides, orderlies, & attendants	2,844	3,329	484	48	3.7%
	43-9061	Office clerks, general	2,601	3,074	473	47	3.7%
	43-4171	Receptionists & information clerks	1,460	1,826	366	37	2.8%
	53-7062	Laborers & freight, stock, & material movers, hand	2,251	2,614	363	36	2.8%
	41-2011	Cashiers	5,804	6,161	358	36	2.8%
	00-0000	**Total**	**88,590**	**101,536**	**12,945**	**1,295**	**100.0%**
Moderate-term on-the-job training	43-3031	Bookkeeping, accounting, & auditing clerks	4,286	5,162	875	88	9.3%
	43-6014	Secretaries, except legal, medical, & executive	4,521	5,343	822	82	8.7%
	47-2061	Construction laborers	2,836	3,643	807	81	8.6%
	53-3032	Truck drivers, heavy & tractor-trailer	5,028	5,696	669	67	7.1%
	47-2073	Operating engineers & other const. equip. operators	2,367	2,839	472	47	5.0%
	49-9042	Maintenance & repair workers, general	2,831	3,284	453	45	4.8%
	43-6011	Executive secretaries & administrative assistants	2,215	2,635	421	42	4.5%
	21-1093	Social & human service assistants	1,211	1,491	280	28	3.0%
	47-5071	Roustabouts, oil & gas	946	1,205	259	26	2.8%
	41-4012	Sales reps, wholesale & mfg., ex. technical products	1,566	1,799	233	23	2.5%
	00-0000	**Total**	**52,381**	**61,785**	**9,404**	**940**	**100.0%**
Long-term on-the-job training	47-2031	Carpenters	2,174	2,733	559	56	18.3%
	47-2111	Electricians	1,843	2,346	503	50	16.5%
	47-2152	Plumbers, pipefitters, & steamfitters	966	1,228	262	26	8.6%
	35-2014	Cooks, restaurant	1,715	1,946	230	23	7.6%
	51-4121	Welders, cutters, solderers, & brazers	1,305	1,535	230	23	7.5%
	33-3051	Police & sheriff's patrol officers	943	1,040	97	10	3.2%
	49-3021	Automotive body & related repairers	339	415	76	8	2.5%
	49-9021	Heating, A/C, & refrigeration mechanics & installers	290	367	76	8	2.5%
	49-2022	Telecommunications equip. installers & repairers	580	655	75	7	2.5%
	33-9099	Protective service workers, all other	542	608	67	7	2.2%
	00-0000	**Total**	**19,686**	**22,735**	**3,049**	**305**	**100.0%**
Experience in a related occupation	47-1011	1st-line sup./mgrs. const. trades & extraction wkrs.	1,824	2,242	419	42	17.0%
	41-1011	First-line sup./mgrs. of retail sales workers	2,572	2,869	297	30	12.0%
	43-1011	1st-line sup./mgrs. of office & admin. support wkrs.	1,620	1,897	277	28	11.2%
	35-1012	First-line sup./mgrs. of food prep. & serving wkrs.	1,684	1,884	200	20	8.1%
	49-1011	1st-line sup./mgrs. of mech., installers, & repairers	1,199	1,359	161	16	6.5%
	11-9199	Managers, all other	968	1,119	151	15	6.1%
	13-1051	Cost estimators	279	355	76	8	3.1%
	37-1011	First-line sup./mgrs. of housekeepers & janitors	447	520	73	7	3.0%
	53-1031	1st-line sup./mgrs. of transportation machine oper.	597	668	71	7	2.9%
	35-1011	Chefs & head cooks	506	576	70	7	2.8%
	00-0000	**Total**	**16,838**	**19,304**	**2,466**	**247**	**100.0%**

(Continued next page)

Table 2: Wyoming's Top 10 Occupations With the Greatest Employment Growth Within Each Typical Education/Experience Level for All Industries, 2002 – 2012 (Continued)

Typical Education/ Experience Level	Standard Occupational Classification (SOC) Code & Title		Employment 2002	Employment 2012	Job Growth 2002 - 2012	Annual Adds.	% of Total Job Growth
Postsecondary vocational award	49-3023	Automotive service technicians & mechanics	1,470	1,791	321	32	17.1%
	29-2061	Licensed practical & licensed vocational nurses	908	1,106	199	20	10.6%
	43-6013	Medical secretaries	610	804	194	19	10.3%
	49-3042	Mobile heavy equipment mechanics, except engines	1,282	1,449	167	17	8.9%
	49-3031	Bus & truck mechanics & diesel engine specialists	769	887	118	12	6.3%
	39-9031	Fitness trainers & aerobics instructors	481	578	97	10	5.2%
	25-2011	Preschool teachers, except special education	295	384	88	9	4.7%
	43-6012	Legal secretaries	269	352	83	8	4.4%
	29-2041	Emergency medical technicians & paramedics	386	448	61	6	3.3%
	31-9094	Medical transcriptionists	248	307	59	6	3.1%
	00-0000	**Total**	**9,457**	**11,336**	**1,879**	**188**	**100.0%**
Associate's degree	29-1111	Registered nurses	3,679	4,326	647	65	35.6%
	15-1041	Computer support specialists	595	765	170	17	9.3%
	29-2034	Radiologic technologists & technicians	492	629	137	14	7.6%
	29-2021	Dental hygienists	317	448	131	13	7.2%
	29-1126	Respiratory therapists	381	508	127	13	7.0%
	29-2071	Medical records & health information technicians	339	401	62	6	3.4%
	23-2011	Paralegals & legal assistants	201	261	61	6	3.3%
	19-4099	Life, physical, & social science techs., all other	345	400	54	5	3.0%
	19-4093	Forest & conservation technicians	484	534	50	5	2.7%
	19-4031	Chemical technicians	233	283	50	5	2.7%
	00-0000	**Total**	**9,081**	**10,900**	**1,819**	**182**	**100.0%**
Bachelor's degree	13-2011	Accountants & auditors	1,185	1,434	249	25	8.7%
	25-2021	Elementary school teachers, except special ed.	2,386	2,589	204	20	7.1%
	25-2031	Secondary school teachers, except special & voc. ed.	2,279	2,472	193	19	6.8%
	13-1199	Business operations specialists, all other	1,335	1,477	143	14	5.0%
	17-2051	Civil engineers	495	633	137	14	4.8%
	11-9021	Construction managers	449	566	117	12	4.1%
	25-3999	Teachers, primary, secondary, & adult, all other	1,052	1,145	93	9	3.3%
	25-2022	Middle school teachers, except special & voc. ed.	1,067	1,157	90	9	3.2%
	11-9141	Property, real estate, & community asso. managers	353	437	83	8	2.9%
	39-9032	Recreation workers	475	552	77	8	2.7%
	00-0000	**Total**	**21,048**	**23,908**	**2,861**	**286**	**100.0%**
Bachelor's plus work experience	11-1021	General & operations managers	4,861	5,785	924	92	52.7%
	11-3031	Financial managers	751	867	116	12	6.6%
	11-9111	Medical & health services managers	594	687	93	9	5.3%
	11-3011	Administrative services managers	567	645	78	8	4.4%
	11-2022	Sales managers	363	419	56	6	3.2%
	25-2041	Special ed. teachers, pre-k/kindergarten/elementary	462	512	49	5	2.8%
	11-1011	Chief executives	286	324	38	4	2.1%
	11-3040	Human resources managers	253	285	32	3	1.8%
	11-3021	Computer & information systems managers	240	273	32	3	1.8%
	11-9032	Education admin., elementary & secondary school	366	397	31	3	1.8%
	00-0000	**Total**	**11,380**	**13,134**	**1,754**	**175**	**100.0%**

(Continued next page)

Table 2: Wyoming's Top 10 Occupations With the Greatest Employment Growth Within Each Typical Education/Experience Level for All Industries, 2002 – 2012 (Continued)

Typical Education/ Experience Level	Standard Occupational Classification (SOC) Code & Title	Employment 2002	Employment 2012	Job Growth 2002 - 2012	Annual Adds.	% of Total Job Growth
Master's degree	29-1123 Physical therapists	301	385	85	8	10.9%
	21-1012 Educational, vocational, & school counselors	454	518	64	6	8.2%
	29-1127 Speech-language pathologists	269	326	57	6	7.4%
	25-4021 Librarians	420	471	51	5	6.6%
	21-1015 Rehabilitation counselors	167	210	43	4	5.5%
	21-1014 Mental health counselors	131	173	43	4	5.5%
	21-1011 Substance abuse & behavioral disorder counselors	134	175	40	4	5.2%
	25-4010 Archivists, curators, & museum technicians	236	277	40	4	5.2%
	19-2042 Geoscientists, except hydrologists & geographers	218	254	36	4	4.6%
	21-1013 Marriage & family therapists	71	99	28	3	3.6%
	00-0000 Total	**4,896**	**5,676**	**780**	**78**	**100.0%**
Doctoral degree	19-3031 Clinical, counseling, & school psychologists	165	196	31	3	91.9%
	19-1042 Medical scientists, except epidemiologists	6	8	2	0	5.4%
	19-1022 Microbiologists	8	9	1	0	2.3%
	19-2012 Physicists	2	2	0	0	0.8%
	15-1011 Computer & information scientists, research	2	2	0	0	-0.3%
	00-0000 Total	**183**	**217**	**34**	**3**	**100.0%**
First professional degree	23-1011 Lawyers	688	870	182	18	30.4%
	29-1051 Pharmacists	475	555	80	8	13.4%
	29-1062 Family & general practitioners	217	279	62	6	10.3%
	29-1067 Surgeons	126	176	50	5	8.4%
	29-1064 Obstetricians & gynecologists	121	171	50	5	8.3%
	29-1020 Dentists	119	167	47	5	7.9%
	29-1041 Optometrists	100	141	41	4	6.8%
	29-1131 Veterinarians	114	151	37	4	6.2%
	29-1011 Chiropractors	37	52	15	2	2.5%
	29-1065 Pediatricians, general	36	50	14	1	2.3%
	00-0000 Total	**2,118**	**2,715**	**597**	**60**	**100.0%**

Table 3: Forecasted Change in Long-Term Employment by Typical Education/Experience Level and Industry for All Industries in Wyoming, 2002 - 2012

Industry	Typical Education/ Experience Level	Employment 2002	Employment 2012	Job Growth 2002 - 2012	Annual Additions	% of Total Job Growth
All Industries	Short-term on-the-job training	88,590	101,536	12,945	1,295	34.4%
	Moderate-term on-the-job training	52,381	61,785	9,404	940	25.0%
	Long-term on-the-job training	19,686	22,735	3,049	305	8.1%
	Experience in a related occupation	16,838	19,304	2,466	247	6.6%
	Postsecondary vocational award	9,457	11,336	1,879	188	5.0%
	Associate's degree	9,081	10,900	1,819	182	4.8%
	Bachelor's degree	21,048	23,908	2,861	286	7.6%
	Bachelor's plus work experience	11,380	13,134	1,754	175	4.7%
	Master's degree	4,896	5,676	780	78	2.1%
	Doctoral degree	183	217	34	3	0.1%
	First professional degree	2,118	2,715	597	60	1.6%
Mining	Short-term on-the-job training	2,921	3,263	342	34	17.8%
	Moderate-term on-the-job training	8,984	10,163	1,179	118	61.3%
	Long-term on-the-job training	2,121	2,225	104	10	5.4%
	Experience in a related occupation	1,445	1,576	130	13	6.8%
	Postsecondary vocational award	613	629	16	2	0.8%
	Associate's degree	264	284	20	2	1.1%
	Bachelor's degree	888	927	39	4	2.1%
	Bachelor's plus work experience	620	710	90	9	4.7%
	Master's degree	112	115	3	0	0.1%
	Doctoral degree	0	0	0	0	0.0%
	First professional degree	7	7	0	0	0.0%
Construction	Short-term on-the-job training	2,404	3,165	761	76	12.4%
	Moderate-term on-the-job training	9,201	12,028	2,827	283	46.1%
	Long-term on-the-job training	5,274	6,951	1,677	168	27.4%
	Experience in a related occupation	1,476	1,904	428	43	7.0%
	Postsecondary vocational award	409	531	122	12	2.0%
	Associate's degree	16	20	4	0	0.1%
	Bachelor's degree	464	596	133	13	2.2%
	Bachelor's plus work experience	564	741	177	18	2.9%
	Master's degree	0	0	0	0	0.0%
	Doctoral degree	0	0	0	0	0.0%
	First professional degree	0	0	0	0	0.0%
Manufacturing	Short-term on-the-job training	2,056	2,006	-50	-5	-30.8%
	Moderate-term on-the-job training	3,348	3,519	171	17	105.0%
	Long-term on-the-job training	2,088	2,084	-3	0	-2.0%
	Experience in a related occupation	681	697	16	2	9.9%
	Postsecondary vocational award	176	186	10	1	6.0%
	Associate's degree	170	162	-8	-1	-4.9%
	Bachelor's degree	530	529	-2	0	-0.9%
	Bachelor's plus work experience	453	480	28	3	17.0%
	Master's degree	7	7	0	0	0.3%
	Doctoral degree	0	0	0	0	0.0%
	First professional degree	9	10	1	0	0.5%

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Table 3: Forecasted Change in Long-Term Employment by Typical Education/Experience Level and Industry for All Industries in Wyoming, 2002 - 2012 (Continued)

Industry	Typical Education/ Experience Level	Employment 2002	Employment 2012	Job Growth 2002 - 2012	Annual Additions	% of Total Job Growth
Wholesale Trade, Transportation, & Utilities	Short-term on-the-job training	4,401	5,084	682	68	31.9%
	Moderate-term on-the-job training	6,450	7,212	761	76	35.6%
	Long-term on-the-job training	1,501	1,647	146	15	6.8%
	Experience in a related occupation	1,482	1,699	216	22	10.1%
	Postsecondary vocational award	1,121	1,297	177	18	8.3%
	Associate's degree	115	123	8	1	0.4%
	Bachelor's degree	500	543	43	4	2.0%
	Bachelor's plus work experience	713	811	98	10	4.6%
	Master's degree	7	8	0	0	0.0%
	Doctoral degree	0	0	0	0	0.0%
	First professional degree	20	27	6	1	0.3%
Retail Trade	Short-term on-the-job training	20,120	22,095	1,975	197	56.8%
	Moderate-term on-the-job training	3,286	3,875	589	59	16.9%
	Long-term on-the-job training	851	921	70	7	2.0%
	Experience in a related occupation	3,237	3,610	373	37	10.7%
	Postsecondary vocational award	888	1,077	189	19	5.4%
	Associate's degree	21	26	5	0	0.1%
	Bachelor's degree	224	271	47	5	1.3%
	Bachelor's plus work experience	1,098	1,267	169	17	4.9%
	Master's degree	0	0	0	0	0.0%
	Doctoral degree	0	0	0	0	0.0%
	First professional degree	347	409	62	6	1.8%
Information	Short-term on-the-job training	1,306	1,437	131	13	26.7%
	Moderate-term on-the-job training	934	1,001	67	7	13.7%
	Long-term on-the-job training	707	719	11	1	2.3%
	Experience in a related occupation	314	346	32	3	6.6%
	Postsecondary vocational award	40	40	1	0	0.1%
	Associate's degree	357	490	133	13	27.2%
	Bachelor's degree	501	557	56	6	11.3%
	Bachelor's plus work experience	462	498	36	4	7.4%
	Master's degree	132	155	23	2	4.7%
	Doctoral degree	2	2	0	0	0.0%
	First professional degree	1	1	0	0	0.0%
Financial Activities	Short-term on-the-job training	3,339	3,846	507	51	32.4%
	Moderate-term on-the-job training	2,215	2,617	402	40	25.7%
	Long-term on-the-job training	151	177	26	3	1.7%
	Experience in a related occupation	728	844	116	12	7.4%
	Postsecondary vocational award	371	465	94	9	6.0%
	Associate's degree	125	145	20	2	1.3%
	Bachelor's degree	1,986	2,256	270	27	17.3%
	Bachelor's plus work experience	984	1,112	128	13	8.2%
	Master's degree	21	23	2	0	0.1%
	Doctoral degree	0	0	0	0	0.0%
	First professional degree	4	4	0	0	0.0%

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Table 3: Forecasted Change in Long-Term Employment by Typical Education/Experience Level and Industry for All Industries in Wyoming, 2002 - 2012 (Continued)

Industry	Typical Education/ Experience Level	Employment 2002	Employment 2012	Job Growth 2002 - 2012	Annual Additions	% of Total Job Growth
Professonal & Business Services	Short-term on-the-job training	5,392	6,841	1,449	145	30.7%
	Moderate-term on-the-job training	3,557	4,667	1,110	111	23.6%
	Long-term on-the-job training	147	192	45	4	1.0%
	Experience in a related occupation	667	857	190	19	4.0%
	Postsecondary vocational award	814	1,061	247	25	5.2%
	Associate's degree	1,135	1,484	349	35	7.4%
	Bachelor's degree	2,358	3,129	771	77	16.4%
	Bachelor's plus work experience	782	1,027	245	24	5.2%
	Master's degree	324	431	107	11	2.3%
	Doctoral degree	5	7	2	0	0.0%
	First professional degree	589	787	198	20	4.2%
Educational & Health Services	Short-term on-the-job training	15,801	18,484	2,684	268	31.5%
	Moderate-term on-the-job training	6,480	7,756	1,276	128	15.0%
	Long-term on-the-job training	868	986	118	12	1.4%
	Experience in a related occupation	1,513	1,757	245	24	2.9%
	Postsecondary vocational award	2,664	3,329	665	67	7.8%
	Associate's degree	5,432	6,569	1,137	114	13.3%
	Bachelor's degree	9,447	10,480	1,034	103	12.1%
	Bachelor's plus work experience	3,544	4,039	495	49	5.8%
	Master's degree	3,504	4,047	543	54	6.4%
	Doctoral degree	163	194	31	3	0.4%
	First professional degree	902	1,208	306	31	3.6%
Leisure & Hospitality	Short-term on-the-job training	23,452	27,135	3,683	368	70.9%
	Moderate-term on-the-job training	1,595	1,954	359	36	6.9%
	Long-term on-the-job training	2,034	2,372	337	34	6.5%
	Experience in a related occupation	3,004	3,475	472	47	9.1%
	Postsecondary vocational award	226	309	83	8	1.6%
	Associate's degree	20	24	5	0	0.1%
	Bachelor's degree	424	522	98	10	1.9%
	Bachelor's plus work experience	521	634	113	11	2.2%
	Master's degree	202	243	41	4	0.8%
	Doctoral degree	0	0	0	0	0.0%
	First professional degree	2	3	0	0	0.0%
Other Services	Short-term on-the-job training	2,105	2,353	248	25	24.9%
	Moderate-term on-the-job training	1,456	1,626	170	17	17.1%
	Long-term on-the-job training	1,051	1,274	223	22	22.4%
	Experience in a related occupation	416	473	57	6	5.7%
	Postsecondary vocational award	1,476	1,682	206	21	20.7%
	Associate's degree	52	56	4	0	0.4%
	Bachelor's degree	534	576	43	4	4.3%
	Bachelor's plus work experience	346	388	42	4	4.2%
	Master's degree	13	14	1	0	0.1%
	Doctoral degree	0	0	0	0	0.0%
	First professional degree	16	17	1	0	0.1%

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Table 3: Forecasted Change in Long-Term Employment by Typical Education/Experience Level and Industry for All Industries in Wyoming, 2002 - 2012 (Continued)

Industry	Typical Education/ Experience Level	Employment 2002	Employment 2012	Job Growth 2002 - 2012	Annual Additions	% of Total Job Growth
All Other	Short-term on-the-job training	5,291	5,827	536	54	23.6%
	Moderate-term on-the-job training	4,875	5,367	492	49	21.7%
	Long-term on-the-job training	2,893	3,188	295	29	13.0%
	Experience in a related occupation	1,875	2,065	190	19	8.4%
	Postsecondary vocational award	660	729	69	7	3.1%
	Associate's degree	1,376	1,517	141	14	6.2%
	Bachelor's degree	3,193	3,521	329	33	14.5%
	Bachelor's plus work experience	1,292	1,425	133	13	5.9%
	Master's degree	575	634	59	6	2.6%
	Doctoral degree	14	15	1	0	0.1%
	First professional degree	220	243	23	2	1.0%

Table 4: Forecasted Change in Long-Term Employment by Typical Education/Experience Level for the Top 10 Industries in Wyoming With the Greatest Forecasted Long-Term Employment Growth, 2002 - 2012

Industry	Typical Education/ Experience Level	Employment 2002	Employment 2012	Job Growth 2002 - 2012	Annual Additions	% of Total Job Growth
Growing Industries	Short-term on-the-job training	39,628	46,720	7,091	709	32.7%
	Moderate-term on-the-job training	21,555	27,491	5,936	594	27.3%
	Long-term on-the-job training	6,585	8,315	1,730	173	8.0%
	Experience in a related occupation	5,960	7,145	1,185	118	5.5%
	Postsecondary vocational award	2,650	3,504	853	85	3.9%
	Associate's degree	3,450	4,554	1,104	110	5.1%
	Bachelor's degree	11,459	13,253	1,794	179	8.3%
	Bachelor's plus work experience	4,623	5,535	911	91	4.2%
	Master's degree	3,550	4,154	604	60	2.8%
	Doctoral degree	131	158	27	3	0.1%
	First professional degree	1,303	1,785	481	48	2.2%
	Total	**100,895**	**122,612**	**21,717**	**2,172**	**100.0%**

Table 5: Forecasted Change in Short-Term Employment by Typical Education/Experience Level for All Industries in Wyoming, 2003 - 2005

Industry Title	Typical Education/ Experience Level	Employment 2002	Employment 2005	Job Growth 2002 - 2005	Annual Additions	% of Total Job Growth
All Industries	Short-term on-the-job training	90,134	92,850	2,717	1,358	31.9%
	Moderate-term on-the-job training	52,997	55,206	2,209	1,105	25.9%
	Long-term on-the-job training	19,786	20,546	760	380	8.9%
	Experience in a related occupation	17,049	17,604	555	277	6.5%
	Postsecondary vocational award	9,600	9,989	389	194	4.6%
	Associate's degree	9,281	9,647	365	183	4.3%
	Bachelor's degree	21,781	22,552	770	385	9.0%
	Bachelor's plus work experience	11,665	12,099	434	217	5.1%
	Master's degree	5,119	5,312	193	96	2.3%
	Doctoral degree	191	198	7	4	0.1%
	First professional degree	2,171	2,293	122	61	1.4%
	Total	**239,775**	**248,296**	**8,521**	**4,261**	**100.0%**

Table 6: Forecasted Change in Short-Term Employment by Typical Education/Experience Level for the Top 10 Industries in Wyoming With the Greatest Forecasted Short-Term Employment Growth, 2003 - 2005

Industry Title	Typical Education/ Experience Level	Employment 2002	Employment 2005	Job Growth 2002 - 2005	Annual Additions	% of Total Job Growth
Growing Industries	Short-term on-the-job training	33,633	35,103	1,469	735	28.2%
	Moderate-term on-the-job training	21,824	23,326	1,502	751	28.9%
	Long-term on-the-job training	7,852	8,392	540	270	10.4%
	Experience in a related occupation	5,740	6,045	305	153	5.9%
	Postsecondary vocational award	2,418	2,584	166	83	3.2%
	Associate's degree	3,556	3,787	231	115	4.4%
	Bachelor's degree	12,577	13,095	518	259	10.0%
	Bachelor's plus work experience	4,911	5,155	244	122	4.7%
	Master's degree	3,317	3,440	123	61	2.4%
	Doctoral degree	133	139	6	3	0.1%
	First professional degree	1,347	1,445	98	49	1.9%
	Total	**97,308**	**102,510**	**5,202**	**2,601**	**100.0%**

confidential Occupational Employment Statistics (OES) program data at the six-digit SOC level and the Quarterly Census of Employment and Wages (QCEW) program data at the three-digit North American Industry Classification System (NAICS) level. The BLS national employment data are available at http://stats.bls.gov/oes/tables. Staffing patterns were designed as an analytical tool to assist firms, workers, economic developers, and others in making informed staffing decisions. In particular, occupational staffing patterns show the number and types of occupations and prevailing wages usually found within an industry. The staffing patterns allow wage comparisons for a specific occupation across industries, as well as comparisons between Wyoming's sub-state regions, statewide, and in other states.

Typical Education/Experience Levels

Short-term on-the-job training. Skills needed to be fully qualified can be acquired during a short demonstration of job duties or less than one month of on-the-job experience or instruction.

Moderate-term on-the-job training. Skills needed to be fully qualified can be acquired during 1 to 12 months of combined on-the-job experience and informal training.

Long-term on-the-job training. More than 12 months of on-the-job training or combined work experience and formal classroom instruction are needed for workers to develop the skills necessary for full qualification. This category includes formal and informal apprenticeships that may last up to five years. Long-term on-the-job training also includes intensive occupation-specific, employer-sponsored programs that workers must successfully complete. These include fire and police academies and schools for air traffic controllers and flight attendants. In other occupations (e.g., insurance sales, securities sales) trainees take formal courses, often provided on the job site, to prepare for the required licensing exams. Generally, individuals undergoing training are considered to be employed in the occupation. Also included in this category is the development of a natural ability such as that possessed by musicians, athletes, actors, and other entertainers that must be cultivated over several years, frequently in a non-work setting.

Experience in a related occupation. Many occupations requiring work experience are first-line supervisors/managers or other management occupations.

Postsecondary vocational award. Some programs last only a few weeks while others may last more than a year. Programs lead to a certificate or other award rather than a degree.

Associate's degree. Completion of the degree usually requires at least two years of full-time academic study.

Bachelor's degree. Completion of the degree usually requires at least four years of full-time academic study.

Bachelor's or higher degree, plus work experience. Most occupations in this category are management occupations. All require experience in a related non-management position for which a bachelor's or higher degree is usually required.

Master's degree. Completion of the degree usually requires one or two years of full-time academic study beyond a bachelor's degree.

Doctoral degree. Completion of a Ph.D. or other doctoral degree usually requires at least three years of full-time academic study beyond a bachelor's degree.

First professional degree. Completion of the degree usually requires at least three years of

full-time academic study beyond a bachelor's degree.

References

Bullard, D. & Leonard, D. (2004). Long-term projections database. [Unpublished data].

U.S. Bureau of Labor Statistics. (2004, March). Educational attainment data improve occupational analysis. In *Occupational projections and training data* (2004-05 ed., Table I-1, pp. 4-33, USDOL Bulletin No. 2572). Washington, DC: U.S. Government Printing Office.

Tools for Identifying Critical Occupations

Mark A. Harris, Ph.D., Sociologist

The purpose of this article is to show occupations and wages associated with short- and long-term North American Industry Classification System (NAICS) growth industries in Wyoming by Standard Occupational Classification (SOC) and to demonstrate direct and associated occupational overlap among high growth industries. Critical occupations are not always obvious when based on projected occupational demand. Serious shortages may occur in other non-demand occupations as market conditions cause a chain reaction of job transfers among individuals in related occupations. This exercise will provide the reader with tools to trace key Wyoming industries and occupations to better predict the critical occupational needs associated with projected industry growth.

Of the top 10 projected short- (2002-2005) and long-term (2002-2012) growth industries in Wyoming, eight are included in both sets of projections (see Table 1). This text focuses on occupations associated with the top four industries located in both (see bolded industries in Table 1): specialty trade contractors; support activities for mining; professional & technical services; and ambulatory health care services. Growth in specialty trade contractors and support activities for mining can be tied directly to the current expansion in oil and gas development (Bullard, 2005). Professional & technical services (e.g., legal services, architectural & engineering services) has both a direct and indirect relationship to the growth in oil and gas. Ambulatory health care services (e.g., offices of physicians) has both direct (due to population expansion) and indirect ties to oil and gas, but also to the current and projected age structure of Wyoming's population (Liu, 2003) and other factors related to employee turnover and retention

Table 1: Wyoming Short- (2002 - 2005) and Long-Term (2002 - 2012) Industry Projections, All Ownerships

Short-Term Industry Growth		Long-Term Industry Growth	
NAICS[a] Industry Code and Title	# of Jobs	NAICS[a] Industry Code and Title	# of Jobs
238 **Specialty trade contractors**	761	238 **Specialty trade contractors**	3,701
611 Educational Services	666	621 **Ambulatory health care services**	2,843
213 **Support activities for mining**	661	541 **Professional & technical services**	2,545
541 **Professional & technical services**	554	722 Food services & drinking places	2,173
621 **Ambulatory health care services**	545	213 **Support activities for mining**	2,074
722 Food services & drinking places	508	611 Educational Services	2,033
561 Administrative & support services	446	721 Accommodation	1,856
236 Construction of buildings	440	561 Administrative & support services	1,758
237 Heavy & civil engineering construction	323	624 Social assistance	1,439
522 Credit intermediation & related services	298	237 Heavy & civil engineering construction	1,295

[a]North American Industry Classification System.

within the health care industry (Glover, 2004a). Nurses, in particular, have been identified as a key or critical occupation with short-term projected occupational shortages (Glover, 2004a).

Top Occupations Based on Highest Projected Industry Growth

Tables 2, 3 (see page 39), 4 (see page 40), and 5 (see page 41) provide the 20 occupations with the highest projected job growth associated with specialty trade contractors, support activities for mining, professional & technical services, and ambulatory health services. Associated occupations for high growth industries were derived from Wyoming's Staffing Patterns & Wages program (Glover, 2004b).

Examples of Direct Occupational Overlap

A number of occupations have overlap among the top four growth industries. Direct overlap can be seen between specialty trade contractors and support activities for mining by six of the 20 occupations shown (see Tables 2 and 3). These include:

- Electricians (SOC 47-2111)
- Operating engineers & other construction equipment operators (47-2073)
- First-line supervisors/managers of construction trades & extraction workers (47-1011)

Table 2: Wyoming's Staffing Patterns & Wages 2003 - Occupations Within Industry, Specialty Trade Contractors (NAICS[a] 238)

			Wyoming				U.S.				Wyoming Projected Growth	
Standard Occupational Classification (SOC) Code & Title	Typical Education	Source of Wages	Employment	Hourly Wage	Annual Wage	%	Employment	Hourly Wage	Annual Wage	%	Short-Term 2002 - 2005	Long-Term 2002 - 2012
47-2111 Electricians	Long OJT	WYXInd	1,196	$18.29	$38,040	9.9	400,850	$21.11	$43,910	9.6	**76**	**367**
47-2061 Construction laborers	Mod OJT	WYXInd	995	9.70	20,170	7.3	299,200	13.70	28,500	7.2	**55**	**269**
47-2051 Cement masons & concrete finishers	Mod OJT	WYXInd	483	11.73	24,400	5.2	119,510	16.30	33,900	2.9	**40**	**194**
47-2073 Oper. engineers & other const. equip. opers.	Mod OJT	WYXInd	483	14.91	31,020	5.1	88,130	19.35	40,240	2.1	**38**	**187**
47-2152 Plumbers, pipefitters, & steamfitters	Long OJT	WYXInd	448	17.32	36,020	4.6	308,170	21.17	44,030	7.4	**35**	**172**
47-2141 Painters, construction & maintenance	Mod OJT	WYXInd	430	14.97	31,130	4.3	158,350	15.43	32,090	3.8	**32**	**158**
47-2031 Carpenters	Long OJT	WYXInd	371	19.27	40,070	3.8	268,050	18.13	37,700	6.4	**29**	**142**
47-1011 1st-line sup/mgrs. const. & extraction wkrs.	Rel Exp	WYXInd	348	19.66	40,890	3.5	188,030	25.68	53,410	4.5	**27**	**129**
47-2181 Roofers	Mod OJT	WYXInd	312	14.19	29,520	3.1	108,280	15.86	32,990	2.6	**24**	**116**
11-1021 General & operations managers	BS/BA +	WYXInd	282	30.62	63,690	2.8	81,520	43.15	89,760	2.0	**21**	**105**
43-3031 Bookkeeping, accounting, & auditing clerks	Mod OJT	WYXInd	249	10.90	22,680	2.6	76,920	14.48	30,110	1.9	**19**	**94**
43-6014 Secretaries, exc. legal, medical, & executive	Mod OJT	WYXInd	230	9.22	19,170	2.4	83,780	11.50	23,910	2.0	**18**	**89**
53-3032 Truck drivers, heavy & tractor-trailer	Mod OJT	WYXInd	209	12.92	26,870	2.3	48,950	15.59	32,430	1.2	**17**	**85**
47-2211 Sheet metal workers	Mod OJT	WYXInd	208	18.45	38,380	2.2	123,370	18.75	38,990	3.0	**17**	**82**
47-3016 Helpers--roofers	Short OJT	WYXInd	199	8.85	18,400	2.1	20,470	10.66	22,170	0.5	**16**	**77**
47-3011 Helpers--brick & stone masons & tile setters	Short OJT	WYXInd	193	11.26	23,430	2.0	54,280	12.85	26,730	1.3	**15**	**73**
47-2130 Insulation workers	Mod OJT	WYXInd	169	13.02	27,070	1.8	41,740	15.86	33,000	1.0	**14**	**68**
47-3015 Helpers--pipelayers, plumbers, & steamfitters	Short OJT	WYXInd	167	11.77	24,490	1.7	64,460	11.39	23,690	1.6	**13**	**64**
47-2011 Boilermakers	Long OJT	USXInd	ND	22.10	45,970	1.6	6,970	22.10	45,970	0.2	**12**	**58**
49-9021 Heating, A/C, & refrig. mech. & installers	Long OJT	WYXInd	ND	17.68	36,780	1.4	120,440	17.16	35,690	2.9	**11**	**53**
Balance of Projection											**232**	**1,119**
Total											**761**	**3,701**

Note: For a complete description of table elements see Wyoming's Staffing Patterns & Wages at http://doe.state.wy.us/LMI/staffingpatterns2003/staffingpatterns2003.htm

[a]North American Industry Classification System.

ND - Not disclosable due to confidentiality.

Table 3: Wyoming's Staffing Patterns & Wages 2003 - Occupations Within Industry, Support Activities for Mining (NAICS[a] 213)

Standard Occupational Classification (SOC) Code & Title	Typical Education	Source of Wages	Wyoming Employment	Wyoming Hourly Wage	Wyoming Annual Wage	Wyoming %	U.S. Employment	U.S. Hourly Wage	U.S. Annual Wage	U.S. %	Wyoming Projected Growth Short-Term 2002 - 2005	Wyoming Projected Growth Long-Term 2002 - 2012
47-5081 Helpers--extraction workers	Short OJT	WYXInd	860	$14.71	$30,610	10.8	13,150	$13.19	$27,440	8.3	**71**	**224**
47-5071 Roustabouts, oil & gas	Mod OJT	WYXInd	738	$13.77	$28,640	8.7	19,330	$12.15	$25,260	12.3	**57**	**180**
47-5013 Service unit operators, oil, gas, & mining	Mod OJT	WYXInd	461	$16.23	$33,770	6.9	9,130	$15.90	$33,080	5.8	**46**	**143**
53-3032 Truck drivers, heavy & tractor-trailer	Mod OJT	WYXInd	451	$14.00	$29,110	6.4	6,300	$12.73	$26,470	4.0	**42**	**133**
47-5099 Extraction workers, all other	Mod OJT	WYXInd	ND	$27.56	$57,320	5.5	ND	ND	ND	ND	**37**	**115**
47-5012 Rotary drill operators, oil & gas	Mod OJT	WYXInd	363	$20.06	$41,730	4.8	11,270	$18.59	$38,660	7.1	**32**	**100**
47-1011 1st-line sup/mgrs. const. & extraction wkrs.	Rel Exp	WYXInd	286	$32.33	$67,260	4.2	8,920	$26.17	$54,440	5.7	**28**	**88**
53-7073 Wellhead pumpers	Mod OJT	WYXInd	268	$15.57	$32,380	4.0	2,360	$13.98	$29,090	1.5	**26**	**82**
11-1021 General & operations managers	BS/BA +	WYXInd	254	$44.01	$91,540	3.7	5,450	$41.51	$86,340	3.5	**25**	**78**
47-2073 Oper. engineers & other const. equip. opers.	Mod OJT	WYXInd	231	$18.61	$38,720	3.4	2,920	$15.80	$32,870	1.9	**23**	**71**
47-5011 Derrick operators, oil & gas	Mod OJT	WYXInd	228	$17.19	$35,750	3.1	12,680	$15.39	$32,020	8.0	**20**	**64**
47-5031 Explosives, ordnance handling, & blasters	Mod OJT	WYXInd	ND	$16.15	$33,600	2.7	610	$14.99	$31,170	0.4	**18**	**57**
49-9042 Maintenance & repair workers, general	Mod OJT	WYXInd	ND	$16.93	$35,220	2.4	2,310	$13.70	$28,490	1.5	**16**	**50**
43-6014 Secretaries, exc. legal, medical, & executive	Mod OJT	WYXInd	161	$11.49	$23,910	2.2	2,880	$11.12	$23,140	1.8	**14**	**45**
51-9061 Insp., testers, sorters, samplers, & weighers	Mod OJT	WYXInd	ND	$15.47	$32,170	1.9	2,060	$16.92	$35,200	1.3	**13**	**40**
47-2111 Electricians	Long OJT	WYXInd	ND	$19.98	$41,560	1.8	1,410	$22.79	$47,410	0.9	**12**	**37**
41-4012 Sales reps, whlsle & mfg, exc. tech products	Mod OJT	WYXInd	110	$22.27	$46,330	1.7	1,090	$28.68	$59,660	0.7	**11**	**34**
51-4041 Machinists	Long OJT	WYXAgg	ND	$15.58	$32,410	1.6	380	$17.35	$36,090	0.2	**10**	**32**
43-3031 Bookkeeping, accounting, & auditing clerks	Mod OJT	WYXInd	98	$12.69	$26,390	1.5	2,070	$14.05	$29,220	1.3	**10**	**31**
53-7062 Freight, stock, & material movers, hand	Short OJT	WYXAgg	ND	$9.72	$20,210	1.4	1,790	$10.15	$21,110	1.1	**9**	**29**
Balance of Projection											**141**	**441**
Total											**661**	**2,074**

Note: For a complete description of table elements see Wyoming's Staffing Patterns & Wages at http://doe.state.wy.us/LMI/staffingpatterns2003/staffingpatterns2003.htm

[a]North American Industry Classification System.

ND - Not disclosable due to confidentiality.

- General & operations managers (11-1021)
- Secretaries, except legal, medical, & executive (43-6014)
- Truck drivers, heavy & tractor-trailer (53-3032)
- Bookkeeping, accounting, & auditing clerks (43-3031)

Direct competition will exist in specialty trade contractors and support activities for mining among these occupations. Support activities for mining will have the advantage in drawing labor from specialty trade contractors as all six of the direct crossover occupations have higher hourly wages in support activities for mining. For example, truck drivers, heavy & tractor-trailer have an hourly wage of $12.92 in specialty trade contractors (NAICS 238) but have an hourly wage of $14.00 in support activities for mining (NAICS 213) resulting in over $1 more per hour or $2,080 annually. The wage differential between the two industries may cause labor shortages for specialty trade contractors and will likely drive hourly wages in specialty trade contractors upward.

Empirical evidence already exists to support the assertion of inter-industry movement. Of the new individuals working in the Mining industry in 2001, 23.0% of them had previously been working in Wyoming in service-providing industries, while 11.1% (353 individuals) came from

Table 4: Wyoming's Staffing Patterns & Wages 2003 - Occupations Within Industry, Professional & Technical Services (NAICS[a] 541)

Standard Occupational Classification (SOC) Code & Title	Typical Education	Source of Wages	Wyoming Employment	Wyoming Hourly Wage	Wyoming Annual Wage	Wyoming %	U.S. Employment	U.S. Hourly Wage	U.S. Annual Wage	U.S. %	Wyoming Projected Growth Short-Term 2002 - 2005	Wyoming Projected Growth Long-Term 2002 - 2012
43-3031 Bookkeeping, accounting, & auditing clerks	Mod OJT	WYXInd	493	$11.46	$23,830	6.8	190,570	$14.47	$30,100	3.1	**37**	**172**
23-1011 Lawyers	Prof	WYXInd	473	$47.56	$98,930	6.2	353,440	$55.02	$114,440	5.7	**34**	**157**
13-2011 Accountants & auditors	BS/BA	WYXInd	462	$23.53	$48,940	5.7	277,220	$29.61	$61,590	4.5	**31**	**144**
43-6014 Secretaries, exc. legal, medical, & executive	Mod OJT	WYXInd	368	$9.43	$19,620	5.0	195,570	$13.12	$27,300	3.2	**28**	**126**
17-2051 Civil engineers	BS / BA	WYXInd	365	$22.76	$47,340	4.4	104,100	$31.56	$65,650	1.7	**24**	**112**
43-6011 Executive secretaries & admin. assistants	Mod OJT	WYXInd	317	$14.13	$29,400	3.8	170,020	$18.29	$38,050	2.8	**21**	**96**
11-1021 General & operations managers	BS/BA +	WYXInd	251	$42.85	$89,130	3.2	155,820	$56.11	$116,710	2.5	**18**	**81**
43-6012 Legal secretaries	PS	WYXInd	229	$13.46	$27,990	2.9	230,120	$17.91	$37,250	3.7	**16**	**73**
43-4111 Interviewers, except eligibility & loan	Short OJT	WYXAgg	ND	$8.53	$17,740	2.6	59,700	$9.29	$19,320	1.0	**14**	**67**
17-1022 Surveyors	BS/BA	WYXInd	182	$22.68	$47,180	2.5	40,390	$20.41	$42,460	0.7	**14**	**64**
31-9096 Veterinary assistants & lab animal caretakers	Short OJT	WYXInd	179	$7.77	$16,150	2.4	58,690	$9.05	$18,830	1.0	**13**	**60**
23-2011 Paralegals & legal assistants	AS/AA	WYXInd	167	$13.22	$27,500	2.2	155,630	$18.99	$39,500	2.5	**12**	**57**
43-9061 Office clerks, general	Short OJT	WYXInd	153	$8.01	$16,660	2.1	223,060	$11.15	$23,190	3.6	**11**	**53**
19-4031 Chemical technicians	AS/AA	WYXInd	150	$11.02	$22,920	1.9	16,770	$16.05	$33,380	0.3	**11**	**49**
17-3011 Architectural & civil drafters	PS	WYXInd	135	$15.38	$31,980	1.7	74,120	$18.57	$38,630	1.2	**10**	**44**
29-2056 Veterinary technologists & technicians	AS/AA	WYXInd	118	$10.55	$21,950	1.6	49,350	$11.56	$24,040	0.8	**9**	**42**
43-4171 Receptionists & information clerks	Short OJT	WYXInd	116	$9.67	$20,110	1.6	108,140	$11.01	$22,900	1.8	**9**	**41**
17-3022 Civil engineering technicians	AS/AA	WYXInd	114	$15.25	$31,730	1.5	38,700	$18.75	$39,000	0.6	**9**	**39**
29-1131 Veterinarians	Prof	WYXInd	108	$26.10	$54,290	1.4	40,660	$36.18	$75,250	0.7	**8**	**36**
17-3031 Surveying & mapping technicians	Mod OJT	WYXInd	104	$14.92	$31,030	1.3	40,110	$14.37	$29,890	0.7	**7**	**33**
Balance of Projection											**218**	**999**
Total											**554**	**2,545**

Note: For a complete description of table elements see Wyoming's Staffing Patterns & Wages at http://doe.state.wy.us/LMI/staffingpatterns2003/staffingpatterns2003.htm

[a]North American Industry Classification System.

ND - Not disclosable due to confidentiality.

Construction and 62.8% came from outside Wyoming (Henderson, 2004).

For illustrative purposes, Wyoming's Staffing Patterns & Wages tool (Glover, 2004b) can be utilized to show all the related industries that will compete for critical occupations (see Table 2 at http://doe.state.wy.us/LMI/staffingpatterns2003/staffing2003.xls). Table 6 (see page 41) shows all industry employment and associated wages for operating engineers and other construction equipment operators. Besides support activities for mining and specialty trade contractors, heavy & civil engineering construction and mining (except oil and gas), which pay $15.43 and $21.49 per hour, respectively, will also compete for operating engineers and other construction equipment operators. Any critical occupation can be traced in this manner to determine industries of direct competition.

Professional & technical services and ambulatory health care services have fewer (five) overlapping occupations, three of which have direct overlap with specialty trade contractors and support activities for mining. The bulk of the overlap occurs in SOC 43-000 (office & administrative support occupations) and SOC 11-000 (management occupations), or broad two-digit occupational categories common across all industries (see Tables 2, page 38; 3, page 39; 4; and 5, page 41).

(Text continued on page 42)

Table 5: Wyoming's Staffing Patterns & Wages 2003 - Occupations Within Industry, Ambulatory Health Care Services (NAICS[a] 621)

Standard Occupational Classification (SOC) Code & Title	Typical Education	Source of Wages	Wyoming Employment	Wyoming Hourly Wage	Wyoming Annual Wage	Wyoming %	U.S. Employment	U.S. Hourly Wage	U.S. Annual Wage	U.S. %	Wyoming Projected Growth Short-Term 2002 - 2005	Wyoming Projected Growth Long-Term 2002 - 2012
29-1111 Registered nurses	AS/AA	WYXInd	563	$18.56	$38,600	7.31	385,220	$24.02	$49,950	8.57	**40**	**208**
31-9091 Dental assistants	Mod OJT	WYXInd	402	$11.13	$23,150	6.16	260,520	$13.56	$28,210	5.80	**34**	**175**
43-6013 Medical secretaries	PS	WYXInd	402	$11.55	$24,020	5.67	246,320	$13.27	$27,600	5.48	**31**	**161**
43-4171 Receptionists & information clerks	Short OJT	WYXInd	348	$8.91	$18,540	4.96	273,410	$11.18	$23,260	6.09	**27**	**141**
29-2021 Dental hygienists	AS/AA	WYXInd	310	$24.45	$50,860	4.36	142,560	$28.18	$58,600	3.17	**24**	**124**
29-1126 Respiratory therapists	AS/AA	WYXAgg	ND	$16.02	$33,330	3.84	6,420	$20.50	$42,630	0.14	**21**	**109**
29-2034 Radiologic technologists & technicians	AS/AA	WYXInd	236	$20.66	$42,970	3.47	60,060	$19.58	$40,730	1.34	**19**	**99**
31-9092 Medical assistants	Mod OJT	WYXInd	212	$10.05	$20,900	3.15	276,710	$11.89	$24,720	6.16	**17**	**90**
43-3031 Bookkeeping, accounting, & auditing clerks	Mod OJT	WYXInd	202	$12.11	$25,190	2.95	66,510	$14.26	$29,660	1.48	**16**	**84**
29-2061 Licensed practical & licensed voc. nurses	PS	WYXInd	176	$13.22	$27,490	2.65	157,900	$15.36	$31,950	3.51	**14**	**75**
43-6014 Secretaries, exc. legal, medical, & executive	Mod OJT	WYXInd	173	$9.73	$20,240	2.45	108,270	$12.44	$25,870	2.41	**13**	**70**
29-1123 Physical therapists	MS/MA	WYXInd	146	$26.21	$54,510	2.24	62,530	$30.18	$62,770	1.39	**12**	**64**
31-1011 Home health aides	Short OJT	WYXInd	140	$8.97	$18,650	2.16	198,850	$8.74	$18,190	4.43	**12**	**61**
43-1011 1st-line sup./mgrs. of admin. support wkrs.	Rel Exp	WYXInd	133	$16.18	$33,660	2.10	114,570	$19.17	$39,870	2.55	**11**	**60**
11-1021 General & operations managers	BS/BA +	WYXInd	131	$32.61	$67,820	2.04	38,670	$38.27	$79,590	0.86	**11**	**58**
37-2011 Janitors & cleaners, except maids	Short OJT	WYXInd	128	$9.19	$19,110	1.97	18,780	$9.30	$19,340	0.42	**11**	**56**
29-1062 Family & general practitioners	N/A	WYXInd	123	$73.65	$153,200	1.91	79,750	$73.05	$151,950	1.78	**10**	**54**
29-1064 Obstetricians & gynecologists	N/A	WYXInd	ND	$64.95	$135,100	1.85	16,590	$89.10	$185,330	0.37	**10**	**53**
29-1067 Surgeons	N/A	WYXInd	ND	$98.76	$205,420	1.82	44,380	$94.33	$196,210	0.99	**10**	**52**
43-6011 Executive secretaries & admin. assistants	Mod OJT	WYXInd	112	$14.40	$29,940	1.77	60,160	$16.70	$34,730	1.34	**10**	**50**
Balance of Projection											**192**	**999**
Total											**545**	**2,843**

Note: For a complete description of table elements see Wyoming's Staffing Patterns & Wages at http://doe.state.wy.us/LMI/staffingpatterns2003/staffingpatterns2003.htm

[a]North American Industry Classification System.

ND - Not disclosable due to confidentiality.

Table 6: Wyoming's Staffing Patterns & Wages 2003 - Occupations by Industry, Operating Engineers & Other Construction Equipment Operators (SOC[a] 47-2073)

NAICS[b] Industry Code & Title	Source of Wages	Wyoming Employ-ment	Wyoming Hourly Wage	Wyoming Annual Wage	Wyoming %	U.S. Employ-ment	U.S. Hourly Wage	U.S. Annual Wage	U.S. %
237 Heavy & Civil Engineering Construction	WYXInd	689	$15.43	$32,090	30.5	105,990	$19.77	$41,130	30.9
999 Federal, State, & Local Government[c]	WYXInd	533	$14.25	$29,640	24.5	73,890	$15.66	$32,580	21.6
238 Specialty Trade Contractors	WYXInd	483	$14.91	$31,020	19.1	88,130	$19.35	$40,240	25.7
212 Mining (except Oil & Gas)	WYXInd	357	$21.49	$44,700	11.5	17,790	$17.03	$35,420	5.2
213 Support Activities for Mining	WYXInd	231	$18.61	$38,720	6.0	2,920	$15.80	$32,870	0.9
811 Repair & Maintenance	WYXAgg	ND	$16.33	$33,960	2.6	410	$15.04	$31,290	0.1
236 Construction of Buildings	WYXInd	49	$16.59	$34,500	1.9	21,080	$20.73	$43,120	6.2
327 Nonmetallic Mineral Product Mfg.	WYXInd	42	$15.62	$32,500	1.3	5,660	$15.15	$31,500	1.7
423 Merchant Wholesalers, Durable Goods	WYXInd	17	$13.91	$28,930	0.7	600	$16.16	$33,610	0.2
532 Rental & Leasing Services	WYXAgg	ND	$16.33	$33,960	0.5	420	$18.45	$38,380	0.1

Note: For a complete description of table elements see Wyoming's Staffing Patterns & Wages at http://doe.state.wy.us/LMI/staffingpatterns2003/staffingpatterns2003.htm

[a]Standard Occupational Classification.

[b]North American Industry Classification System.

[c]Occupational Employment Statistics (OES) designation.

ND - Not disclosable due to confidentiality.

Examples of Associated Indirect Occupational Overlap

Occupational growth within industries may also be affected by associated or indirect occupational overlap among critical occupations. This overlap occurs in occupations that are technically separate, but have substantial overlapping skills sets such that occupational movement is likely under the right market conditions. Thus, growth in one occupation not only creates a demand for individuals already in that occupation (i.e., from interstate labor sources) but may also create labor shortages in other related occupations within the state as sufficient pay, geographic location of jobs, and training opportunities converge to make an occupational upgrade probable.

To illustrate this point, Table 7 shows related occupations for rotary drill operators, oil & gas. According to a recent press release, drillers in the state want to train 5,000 workers in drilling rig operations (Bleizeffer, 2005). Related occupations for rotary drill operators, oil & gas include three other construction and extraction occupations (paving, surfacing, & tamping equipment operators; operating engineers & other construction equipment operators; and derrick operators, oil & gas). Among the four related occupations shown in Table 7, rotary drill operators, oil & gas has the highest average hourly wage. Wage-driven job changing toward rotary drill operators, oil & gas from the other related occupations is likely and may cause labor shortages among other industries employing these occupations (e.g., specialty trade contractors; heavy & civil engineering construction; construction of buildings; and mining [except oil & gas]). Construction and extraction occupations are likely areas of potential competition within the state over the next decade. The Figure (see page 43) illustrates graphically the concepts of wage-driven direct occupational movement between industries (see Panel A) and related occupational movement both inter- and intra-industry (see Panel B).

Recent growth in oil and gas development in the state is also a likely driver for growth within professional and technical services among occupations that support oil and gas development. Civil engineers, surveyors, chemical technicians, civil engineering technicians, and surveying & mapping technicians are likely candidates.

Potential Mitigating Factors

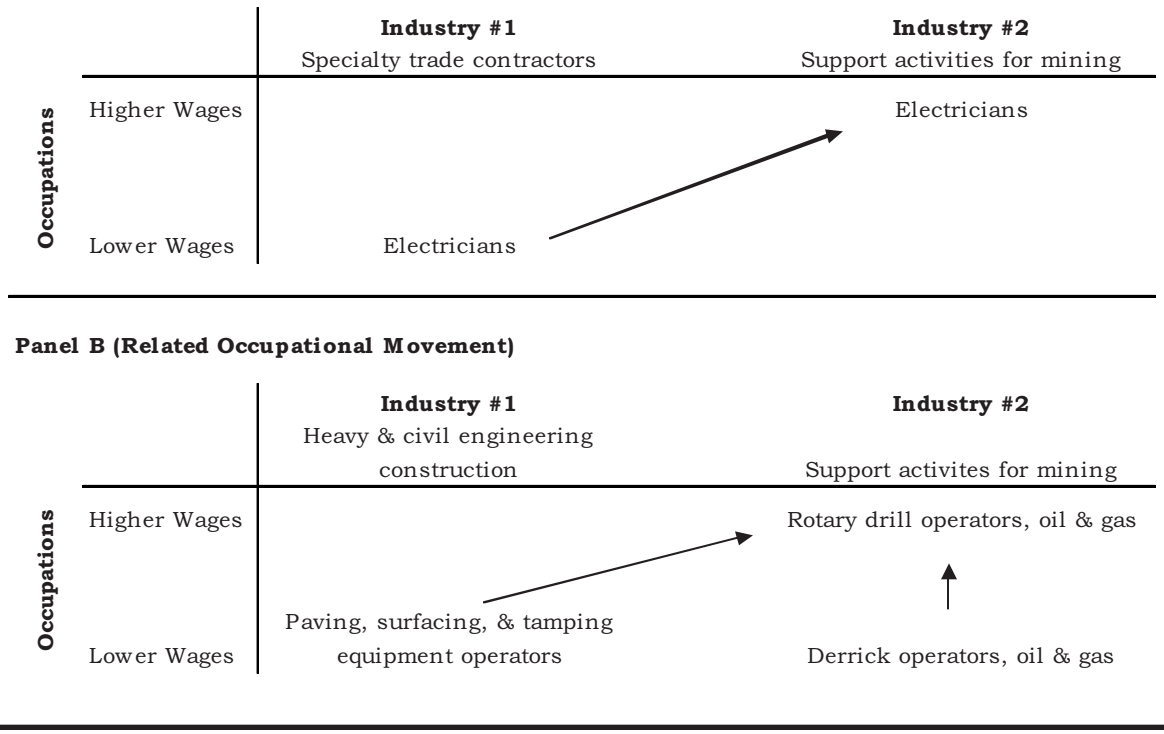
Wyoming's current labor supply system may mitigate some of the critical occupational shortages that can occur as a

Table 7: Wyoming ANSWERS[a] Related Occupations for Rotary Drill Operators, Oil & Gas (SOC 47-5012)

Standard Occupational Classification (SOC) Code	Title	Average Hourly Wage
47-5012	Rotary drill operators, oil and gas	$18.13
47-2071	Paving, surfacing, and tamping equipment operators	$16.13
47-2073	Operating engineers and other construction equipment operators	$16.12
47-5011	Derrick operators, oil and gas	$17.83

[a]See http://doe.state.wy.us/ANSWERS/

Figure: Wage Driven Direct and Related Occupational Movement



result of direct and associated occupational overlap among industries. Of jobs held by May 2002 Wyoming community college graduates (588 jobs total), 14.2% (84 jobs) were in construction & extraction; installation, maintenance & repair; production; and transportation & material moving (see Table 8, page 44). Although it is unlikely that current output from Wyoming's community colleges is sufficient to supply projected demand, steps could be taken to increase the number of Wyoming graduates with technical skills. Surveys of employers who hired graduates reveal that they were highly satisfied with the work habits and skills of Wyoming's community college graduates (see Table 9, page 45) from technical training programs (e.g., 7.5 on a scale of 1 to 10 for graduates from construction trades instructional programs and 8.2 on a scale of 1 to 10 for graduates from transportation and materials moving programs). Wyoming's community college system may be underutilized as a supplier of qualified workers.

Summary

Wyoming will likely experience labor supply shortages in occupations critical to oil and gas development over the next decade. Shortages may be manifest, however, in related occupations as individuals make job upgrades driven by wage competition. Substantial instability in oil and gas prices will alter this scenario and are difficult to predict.

(Text continued on page 46)

Table 8: Jobs Held in Wyoming by May 2002 Wyoming Community College Graduates[a] by Major Occupational Group, Second Quarter 2003

2-Digit SOC[b] Code and Title		Total Graduates Number	Column %
11	Management	6	1.0%
13	Business & Financial Operations	3	0.5%
15	Computer & Mathematical Science	7	1.2%
17	Architecture & Engineering	7	1.2%
19	Life, Physical, & Social Science	1	0.2%
21	Community & Social Services	11	1.9%
23	Legal	2	0.3%
25	Education, Training, & Library	59	10.0%
27	Arts, Design, Entertainment, Sports, & Media	9	1.5%
29	Healthcare Practitioner & Technical	124	21.1%
31	Healthcare Support	26	4.4%
33	Protective Service	12	2.0%
35	Food Preparation & Serving Related	49	8.3%
37	Building & Grounds Cleaning & Maintenance	23	3.9%
39	Personal Care & Service	23	3.9%
41	Sales & Related	48	8.2%
43	Office & Administrative Support	89	15.1%
45	Farming, Fishing, & Forestry	5	0.9%
47	Construction & Extraction	30	5.1%
49	Installation, Maintenance, & Repair	23	3.9%
51	Production	12	2.0%
53	Transportation & Material Moving	19	3.2%
	Subtotal	588	100.0%
	Occupation unavailable[c]	306	34.2%
	Total	894	100.0%

[a]Based on information obtained from a survey of employers of graduates by Research & Planning. May include multiple responses for a single employer or graduate.

[b]Standard Occupational Classification.

[c]Occupation information is unavailable because the employer did not respond to the survey, did not report the graduate's occupation as requested, or because the employer reported that they had no record of the graduate as an employee.

Source: Saulcy, S. (2004, August). *Where are they now? Wyoming community college graduates' labor market outcomes 2004*. Casper, WY: Wyoming Department of Employment, Research & Planning.

Table 9: Wyoming Employer Satisfaction[a] With Work Skills and Habits of May 2002 Wyoming Community College Graduates by Instructional Program, Second Quarter 2003

2-Digit CIP[b] Code and Title	How would you rate your overall satisfaction with the employee's work *skills*?		How would you rate your overall satisfaction with the employee's work *habits*?	
	Number of Responses	Average Score[c]	Number of Responses	Average Score[c]
01 Agricultural Business & Production	4	7.3	4	7.0
02 Agricultural Sciences	4	10.0	4	10.0
03 Conservation & Renewable Natural Resources	1	8.0	1	8.0
09 Communications	8	7.6	8	7.3
11 Computer & Information Sciences	15	7.3	15	7.1
12 Personal & Misc. Services	44	8.2	43	8.3
13 Education	4	7.3	4	7.5
14 Engineering	6	9.5	6	9.5
15 Engineering-Related Technologies	4	8.8	4	8.8
16 Foreign Languages & Literatures	8	7.5	8	7.5
22 Law & Legal Studies	6	8.0	6	7.7
23 English Language & Literature/Letters	51	8.5	51	8.6
24 Liberal Arts & Sciences, General Studies & Humanities	8	9.0	8	8.6
26 Biological Sciences/Life Sciences	2	9.5	2	9.5
27 Mathematics	4	8.3	4	8.3
30 Multi/Interdisciplinary Studies	1	8.0	1	8.0
31 Parks, Recreation, Leisure & Fitness Studies	1	9.0	1	9.0
40 Physical Sciences	7	8.6	7	9.1
42 Psychology	15	7.9	15	8.1
43 Protective Services	1	9.0	1	9.0
44 Public Administration & Services	6	8.0	6	7.5
45 Social Sciences & History	1	4.0	1	8.0
46 Construction Trades	19	7.5	19	7.6
47 Mechanics & Repairers	15	7.9	15	8.2
48 Precision Production Trades	4	6.8	4	8.0
49 Transportation & Materials Moving Workers	29	8.2	29	8.3
50 Visual & Performing Arts	88	8.3	88	8.4
51 Health Professions & Related Sciences	62	8.5	62	8.5
52 Business Management & Administrative Services	2	9.0	2	9.5
Subtotal	420	8.4	419	8.5
Satisfaction score unavailable[d]	474	N/A	475	N/A
Total for all graduates matching Wage Records	894	N/A	894	N/A

[a]For valid responses obtained from a survey of employers of graduates by Research & Planning. May include multiple responses for a single employer or graduate.

[b]Classification of Instructional Programs.

[c]Based on a scale of 1 to 10 where 1 is very dissatisfied and 10 is very satisfied.

[d]Satisfaction score is unavailable because the employer did not respond to the survey, did not report a score as requested, or because the employer reported that they had no record of the graduate as an employee.

N/A - Not applicable.

Source: Saulcy, S. (2004, August). *Where are they now? Wyoming community college graduates' labor market outcomes 2004*. Casper, WY: Wyoming Department of Employment, Research & Planning.

References

Bleizeffer, D. (2004). Drillers want to train 5,000 workers. *Casper Star Tribune*. January 22, 2005 (A1, A12).

Bullard, D. (2005, January). Covered employment and wages for second quarter 2004: Employment growth remains healthy. *Wyoming Labor Force Trends*. Retrieved March 31, 2005, from http://doe.state.wy.us/LMI/0105/a2.htm

Glover, W. (2004a). Transaction data (turnover): An application to occupational projections and a strategy for estimating replacement need at the state level for registered nurses. In S. Murray and K. R. Shinkle (Eds.) *Occupational outlook: 2010* (pp. 61-77). Casper, WY: Wyoming Department of Employment, Research & Planning.

Glover, W. (2004b). *Introduction to Wyoming's occupational staffing patterns and wages 2003*. Retrieved March 31, 2005, from http://doe.state.wy.us/LMI/staffingpatterns2003/staffingpatterns2003.htm

Henderson, C. R. (2004, July). Economic recovery and labor availability in Wyoming. *Wyoming Labor Force Trends*. Retrieved April 1, 2005, from http://doe.state.wy.us/LMI/0704/a1.htm

Liu, W. (2003). Wyoming's resident population: Historical and projected data. In S. Murray and K. R. Shinkle (Eds.) *Employment outlook: 2010* (pp. 41-46). Casper, WY: Wyoming Department of Employment, Research & Planning.

Saulcy, S. (2004, August). *Where are they now? Wyoming community college graduates' labor market outcomes 2004* (pp. 46, 56). Casper, WY: Wyoming Department of Employment, Research & Planning.

Wyoming Department of Employment, Research & Planning. (2004). *Occupational and employment projections*. Retrieved March 28, 2005, from http://doe.state.wy.us/LMI/outlTOC.htm

Registered Nurses in Wyoming: Do Occupational Projections Accurately Depict the Projected Employment Change?

Tony Glover, Senior Research Analyst

The occupational projections discussed in "Industries and Occupations With a Demand for Skilled Workers and Available Jobs" (see page 23) offer a relatively limited perspective of forecasted employment. The foundations of the occupational employment projections are the industry projections (at the three-digit NAICS level) and Occupational Employment Survey (OES) data. The approach is necessarily narrow as, in most cases, there is only one available method for calculating projections.

For example, assume that registered nurses (RNs) in Wyoming work in only one industry, hospitals (NAICS 622000). Let us also assume that the total employment for hospitals was 100 in 1992 and 200 in 2002 and that the hospital industry systematically added 10 jobs per year. This historic trend is used to project future employment in the hospital industry. In this example (continuing to add 10 jobs per year), there will be 300 jobs in 2012. The OES data (collected in 2002) surveyed hospitals about the quantity (number), types (occupations), and wages of current jobs. Results show that for every ten jobs in hospitals there are two RNs. Therefore, the occupational projections would predict that Wyoming will add two nurses per year or a total of 20 over the next decade.

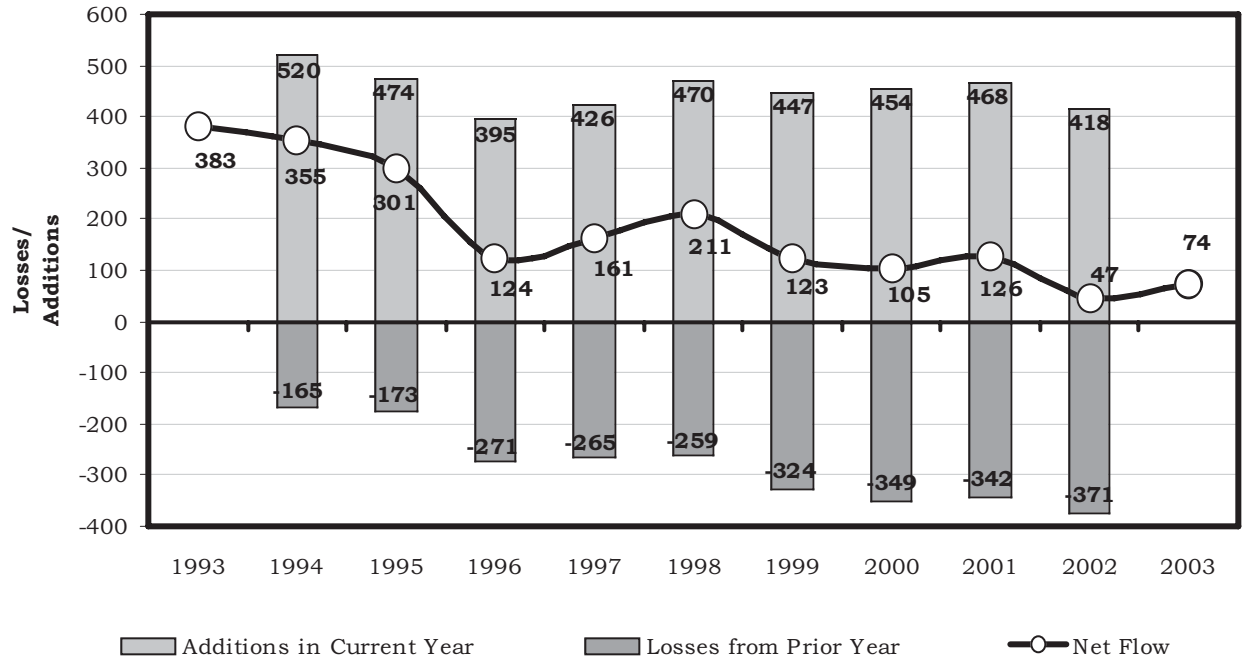
In the simplified hypothetical example above, RNs only work in hospitals. In reality, the data presented in Table 2 from "Industries and Occupations With a Demand for Skilled Workers" (see page 2) is the result of the same process applied to RNs working in fifteen industries and aggregated to a statewide total.

Employment growth and the total projected employment gain in the number of nurses from 3,679 in 2002 to 4,326 in 2012 is 647. However, these projections do not consider losses due to turnover, retirement, withdrawal from the labor market, and out-migration from the state.

Wage Records combined with the Wyoming State Board of Nursing's (WSBN) Registered Nurse License database offer an alternative approach to understanding the ebbs and flows of RNs in Wyoming's labor market. In the base year of 2002, there were 4,186 licensed RNs working in Wyoming, but because there were an estimated 3,679 RN jobs, some may not have been working as RNs. Referring to the Figure (see page 48), of the 3,679 RNs working in Wyoming in 2002, 418 were additions who did not work in Wyoming in the previous year as RNs. There were also 371 RNs who did not continue to work in 2002 (losses). The difference between the additions (418) and the losses (-371) is the net flow (47).

A review of the entire time series in the Figure shows that the market is not as simple as that suggested by the occupational projections in "Industries and Occupations With a Demand for Skilled Workers." Those projections show the number of RNs increasing from 3,679 in 2002 to 4,326 in 2012. However, each year there are a large number of RNs added to the market and an increasingly large number who leave. Currently, the net flow

Figure: Number of Additions, Losses, and Net Flow of Registered Nurses in Wyoming Covered Employment, 1993 - 2003



is positive (remains above zero), but if the present pattern continues, we will begin to lose more RNs than we gain and the result will be an outflow of RNs from Wyoming.

Subsidized Training: Wyoming Hospitality Alliance Mentoring Program Preliminary Report

Sara Saulcy, Senior Economist

Food services & drinking places, a sub-industry of Leisure & Hospitality, is projected to be among the fastest growing industries over both the short- and long-term (see Tables 3, page 18; and 5, page 19, respectively). In order for continued growth to occur in food services & drinking places, a unique set of occupational needs must be met by Wyoming's labor force.

A relatively new program available to high school students is helping youth gain marketable work skills in the industry. The Wyoming Lodging & Restaurant Association (WLRA) subsidizes training for students in 25 Wyoming high schools through its Wyoming Hospitality Alliance Mentoring (WHAM) program. WHAM was established in 1999 as a means to expose students to career opportunities in Leisure & Hospitality and supply firms in that industry with skilled workers.

In winter 2004, R&P teamed with WLRA to determine WHAM participant employment outcomes. A Memorandum of Understanding between the two permitted WLRA to share its 2003 WHAM participant data with R&P. Participants' social security numbers (SSNs) were matched to administrative data, including Wyoming community colleges' enrollment and Unemployment Insurance Wage Records databases. Matching SSNs to administrative data sources helps to determine a wide variety of outcomes such as how many students attended and graduated from college, industries in which participants work, earnings, and turnover.

In 2003, there were 173 WHAM participants. In second quarter 2004 (2004Q2), approximately one year after program completion, 102 were employed in Wyoming. These individuals worked for 114 employers at a total of 136 jobs. The number of jobs held is larger than the number of participants because some participants worked for more than one employer during the quarter. Some students continued their education beyond high school while working. There were 58 participants taking community college courses in spring or fall 2003.

The Table (see page 50) shows the number of Wyoming jobs held by 2003 WHAM participants one year after program completion (2004Q2). Just over one-third (33.6%) of the jobs held were in Leisure & Hospitality, suggesting that participants are indeed helping to fill the industry's labor needs. In addition to Leisure & Hospitality, participants were also concentrated in Trade, Transportation, & Utilities (27.6%) and Educational & Health Services (17.2%). The remaining industries each employed 7.5% or fewer of the participants.

While the overall objective of WHAM is promoting opportunities in Leisure & Hospitality, other industries appear to be benefiting from the training provided by the program. WHAM provides managerial training that has a direct logical crossover to Retail Trade. Over the 2002-2012 period, the Leisure & Hospitality and Trade, Transportation, & Utilities industries are projected to grow by more than 5,000 jobs

Table: Jobs Held in Wyoming by 2003 Wyoming Hospitality Alliance Mentoring Program Participants by Industry, Second Quarter 2004

Industry	Number[a]	%
Natural Resources & Mining	0	0.0%
Construction	7	5.2%
Manufacturing	ND	ND
Trade, Transportation, & Utilities	37	27.6%
Information & Other Services	4	3.0%
Financial Activities	ND	ND
Professional & Business Services	4	3.0%
Educational & Health Services	23	17.2%
Leisure & Hospitality	45	33.6%
Public Administration	10	7.5%
Total	**136**	**100.0%**

[a]May include multiple reponses for a single program participant or employer.
ND - Not disclosable due to confidentiality.

each (Research & Planning, 2004). WHAM participants may have an advantage over their counterparts without these work skills in gaining employment in these and other industries. Furthermore, firms might be able to reduce employee training costs by taking advantage of the skills workers acquire through the WHAM program.

References

Wyoming Department of Employment, Research & Planning. (2004). *Occupational and employment projections*. Retrieved April 4, 2005, from http://doe.state.wy.us/LMI/outlTOC.htm

Using O*NET to Identify Skill Needs for the Available, Critical, and Projected Jobs

Sylvia D. Jones, Senior Research Analyst

O*NET, the Occupational Information Network, is a comprehensive database of worker attributes and job characteristics (O*NET Consortium, n.d.). The database serves as a resource that supports public and private sector efforts to identify and develop the skills of the American workforce. It provides a common language for defining and describing occupations. Its flexible design also captures rapidly changing job requirements. Part of this design includes 46 skills that describe worker requirements. Each is ranked by importance from 1 to 5 for each occupation. The 46 skills are divided into six broad categories:

- Content Skills
- Process Skills
- Social Skills
- Technical Skills
- Systems Skills
- Resource Management Skills

Skill Needs of the Available Jobs

Occupations found in industries with the greatest forecasted short-term employment growth were matched against the O*NET skills database. This resulted in each occupation having a set of associated skills with varying levels of importance.

As an example, Table 1 (see page 52) illustrates the level of importance for the various skills for one occupation: travel agents. The level of importance can range from 1 to 5, with 1 being the least and 5 the most important. In this case, coordination, service orientation, and speaking are the three most important. Installation, programming, repairing, and science are the least important.

Table 2, (see page 53) illustrates the primary O*NET skill only. Using this method, each job is represented by only one skill. Therefore, employment projections can also be used as a skills projection because each job reflects a primary skill. Operation and control is the fastest growing primary skill in the short term (between 2003 and 2005), with an expected increase of 571 associated jobs across 48 different occupations. Operation and control is defined as *controlling operations of equipment or systems* and is a component of such occupations as commercial pilots (Standard Occupational Classification [SOC] 53-2012), petroleum pump systems operators (SOC 51-8093), and broadcast technicians (SOC 27-4012). Service orientation is the second fastest growing skill with an expected increase of 484 jobs in 26 occupations. Table 3 (see page 54) lists the occupations defining service orientation as the primary skill.

Technical skills such as equipment selection, installation, and repairing comprise the largest percentage of the top 10 fastest growing skills. These are very concrete skills as opposed to basic learning skills or more abstract constructs like visioning. This finding further emphasizes results in “Industries and Occupations

(Text continued on page 54)

Table 1: O*NET Skills and Associated Level of Importance for Travel Agents (SOC[a] 41-3041)

O*NET Skill	Level of Importance
Coordination	4.0
Service Orientation	4.0
Speaking	4.0
Implementation Planning	3.8
Active Listening	3.5
Information Gathering	3.5
Mathematics	3.2
Reading Comprehension	3.2
Identification of Key Causes	3.0
Persuasion	3.0
Problem Identification	3.0
Time Management	3.0
Idea Generation	2.8
Information Organization	2.8
Judgment and Decision Making	2.8
Social Perceptiveness	2.8
Critical Thinking	2.7
Solution Appraisal	2.7
Writing	2.5
Negotiation	2.3
Operation and Control	2.3
Operations Analysis	2.3
Active Learning	2.2
Idea Evaluation	2.2
Product Inspection	2.2
Synthesis/Reorganization	2.2
Monitoring	2.0
Systems Perception	2.0
Identifying Downstream Consequences	1.8
Management of Financial Resources	1.8
Management of Material Resources	1.8
Visioning	1.7
Equipment Selection	1.5
Learning Strategies	1.5
Systems Evaluation	1.3
Equipment Maintenance	1.2
Instructing	1.2
Management of Personnel Resources	1.2
Operation Monitoring	1.2
Technology Design	1.2
Testing	1.2
Troubleshooting	1.2
Installation	1.0
Programming	1.0
Repairing	1.0
Science	1.0

[a]Standard Occupational Classification.

Table 2: Projected Growth of Primary Occupation Skill for Occupations in Industries With the Greatest Forecasted Short-Term Employment Growth, 2003 - 2005

O*NET Skill	Number of Occupations	Employment 2003	Employment 2005	Job Growth 2003 - 2005
Operation and Control	48	9,441	10,012	571
Service Orientation	26	13,884	14,369	484
Equipment Selection	16	5,857	6,316	459
Installation	17	4,397	4,749	352
Instructing	36	12,208	12,537	329
Mathematics	21	5,050	5,378	329
Coordination	20	5,104	5,384	281
Repairing	22	3,416	3,678	262
Management of Personnel Resources	10	2,961	3,155	194
Reading Comprehension	16	2,949	3,127	178
Equipment Maintenance	7	4,238	4,414	176
Speaking	27	2,701	2,864	163
Product Inspection	22	2,719	2,868	148
Information Gathering	19	1,598	1,708	110
Problem Identification	14	1,518	1,615	97
Persuasion	6	1,397	1,489	91
Operation Monitoring	1	977	1,062	84
Time Management	5	2,258	2,324	66
Information Organization	10	1,249	1,314	64
Judgment and Decision Making	10	929	992	64
Science	15	795	851	56
Active Listening	7	641	675	34
Troubleshooting	7	523	550	26
Management of Financial Resources	2	397	421	24
Critical Thinking	4	277	298	20
Social Perceptiveness	7	467	484	17
Programming	3	275	289	15
Idea Generation	6	157	166	9
Writing	3	152	161	9
Testing	3	124	133	9
Operations Analysis	5	113	121	8
Implementation Planning	3	92	99	6
Learning Strategies	1	99	101	3
Active Learning	2	29	32	2
Identification of Key Causes	1	23	25	1
Negotiation	1	18	19	1
Visioning	1	6	7	0
Management of Material Resources	1	6	6	0
Monitoring	1	2	2	0
Systems Evaluation	1	2	2	0

Note: Skills reflect only the primary skill required for the occupation.

Table 3: Occupations Whose Primary Skill is "Service Orientation"

Standard Occupational Classification (SOC) Code	Title
43-4181	Reservation & transportation ticket agents & travel clerks
35-3011	Bartenders
35-3031	Waiters & waitresses
41-2031	Retail salespersons
11-9081	Lodging managers
31-1012	Nursing aides, orderlies, & attendants
31-9092	Medical assistants
35-3021	Combined food preparation & serving workers, including fast food
31-1011	Home health aides
35-9031	Hosts & hostesses, restaurant, lounge, & coffee shop
43-4081	Hotel, motel, & resort desk clerks
43-4151	Order clerks
29-1111	Registered nurses
31-2011	Occupational therapist assistants
31-2012	Occupational therapist aides
39-3031	Ushers, lobby attendants, & ticket takers
41-2021	Counter & rental clerks
29-2061	Licensed practical & licensed vocational nurses
39-9021	Personal & home care aides
41-3041	Travel agents
35-3022	Counter attendants, cafeteria, food concession, & coffee shop
35-3041	Food servers, nonrestaurant
35-9011	Dining room & cafeteria attendants & bartender helpers
35-2012	Cooks, institution & cafeteria
35-2021	Food preparation workers
37-2012	Maids & housekeeping cleaners

With a Demand for Skilled Workers" on page 23 (specifically, see Table 5, page 33) which report that the majority of job growth in Wyoming will require on-the-job training rather than advanced education (Wyoming Department of Employment, n.d).

In order to develop a profile of the growth of all rather than just the primary skill, we created an index of importance. Each skill associated with an occupation was given a relative weight based on the O*NET assigned level of importance. The weights were applied to the occupational projections so expected changes in skill importance could be observed.

Table 4 (see page 55) contains an index of importance for 2003 to 2005. The index was created only for occupations found in industries with the greatest short-term employment growth. According to this measure, active listening and speaking are the two most important. None of the skills changed in their relative importance during the short-term projection period. This can be interpreted to mean that the foundation

(Text continued on page 56)

Table 4: Index of Skills Needs Reflecting Changes in the Projected Staffing Pattern for Occupations in Industries With the Greatest Forecasted Short-Term Employment Growth, 2003 - 2005

O*NET Skill	Index of Importance 2003	2005
Active Listening	1.5	1.5
Speaking	1.5	1.5
Reading Comprehension	1.4	1.4
Problem Identification	1.3	1.3
Mathematics	1.3	1.3
Information Organization	1.3	1.3
Product Inspection	1.3	1.3
Writing	1.2	1.2
Information Gathering	1.2	1.2
Equipment Selection	1.2	1.2
Coordination	1.2	1.2
Social Perceptiveness	1.2	1.2
Monitoring	1.2	1.2
Operation and Control	1.2	1.2
Service Orientation	1.1	1.1
Judgment and Decision Making	1.1	1.1
Solution Appraisal	1.1	1.1
Identification of Key Causes	1.1	1.1
Critical Thinking	1.0	1.0
Time Management	1.0	1.0
Idea Evaluation	1.0	1.0
Active Learning	1.0	1.0
Implementation Planning	0.9	0.9
Idea Generation	0.9	0.9
Equipment Maintenance	0.9	0.9
Learning Strategies	0.9	0.9
Operation Monitoring	0.9	0.9
Management of Material Resources	0.9	0.9
Troubleshooting	0.9	0.9
Synthesis/Reorganization	0.9	0.9
Visioning	0.9	0.9
Instructing	0.8	0.8
Installation	0.8	0.8
Repairing	0.8	0.8
Systems Perception	0.8	0.8
Identifying Downstream Consequences	0.8	0.8
Operations Analysis	0.8	0.8
Science	0.8	0.8
Systems Evaluation	0.8	0.8
Management of Personnel Resources	0.8	0.8
Testing	0.8	0.8
Management of Financial Resources	0.8	0.8
Persuasion	0.8	0.8
Technology Design	0.7	0.7
Negotiation	0.7	0.7
Programming	0.5	0.5

Note: Skills are associated with occupations found in industries with the greatest short-term employment growth.

of Wyoming's economy and its dependence on basic skills is unlikely to change quickly.

Of the top 10 highest ranking, basic skills (e.g., active listening, speaking, reading comprehension, mathematics, and writing) comprised the largest percentage. Every occupation relies to some extent on the ability of workers to communicate and learn.

Skills Needs of the Projected Jobs

The same process of matching O*NET skills to occupations and ranking them by level of importance was applied to occupations found in industries with the greatest forecasted long-term employment growth. Table 5 (see page 57) illustrates the projected growth of the primary skill. In this case, service orientation is the fastest growing with an expected increase of 3,519 associated jobs. Operation and control is the second fastest with growth of 2,232 jobs. Although the relative order changed over the forecast period, the broad category of technical skills remained the largest contributor to the top 10. This was again in line with projected educational requirements of primarily on-the-job training.

Table 6 (see page 58) contains the index of importance for the occupations with the greatest forecasted long-term occupational employment growth. The relative importance is similar to that found in occupations whose primary skill is service orientation in that active listening and speaking are the two most important (Wyoming Department of Employment, n.d.).

Two skills increased their index over the time period by 0.1: implementation planning and troubleshooting. This indicates that we project those to be somewhat more in demand in 2012 than in 2002. The top 10 is dominated by fundamental skills; emphasizing the importance of basic education.

References

O*NET Consortium. (n.d.). *What is O*NET?* Retrieved April 11, 2005, from http://www.onetcenter.org/overview.html

Table 5: Projected Growth of Primary Occupation Skill for Occupations in Industries With the Greatest Forecasted Long-Term Employment Growth, 2002 - 2012

O*NET Skill	Number of Occupations	Employment 2002	Employment 2012	Job Growth 2002 - 2012
Service Orientation	30	20,832	24,351	3,519
Operation and Control	49	9,419	11,651	2,232
Equipment Selection	16	4,511	5,885	1,374
Instructing	37	12,253	13,506	1,253
Coordination	20	5,169	6,387	1,218
Repairing	22	3,303	4,377	1,074
Mathematics	19	3,590	4,580	991
Installation	16	3,111	4,014	903
Equipment Maintenance	7	4,561	5,350	789
Reading Comprehension	15	2,839	3,585	746
Product Inspection	23	3,057	3,751	694
Speaking	26	2,709	3,401	692
Management of Personnel Resources	10	2,597	3,227	630
Information Gathering	19	1,553	2,026	473
Social Perceptiveness	7	1,682	2,124	443
Problem Identification	14	1,355	1,757	403
Persuasion	6	1,209	1,556	347
Time Management	5	2,571	2,918	347
Science	15	983	1,281	298
Information Organization	10	1,189	1,461	272
Operation Monitoring	1	947	1,215	268
Judgment and Decision Making	9	587	789	202
Active Listening	7	702	864	162
Troubleshooting	7	509	610	102
Critical Thinking	4	269	369	100
Programming	3	261	320	59
Management of Financial Resources	2	206	251	45
Writing	3	143	180	37
Operations Analysis	5	111	146	35
Idea Generation	6	142	177	35
Testing	3	114	146	32
Implementation Planning	3	88	115	27
Active Learning	2	29	39	10
Learning Strategies	1	93	101	8
Identification of Key Causes	1	19	24	5
Negotiation	1	16	19	3
Visioning	1	6	7	1
Management of Material Resources	1	6	6	0
Monitoring	1	2	2	0
Systems Evaluation	1	2	2	0

Note: Skills reflect only the primary skill required for the occupation.

Table 6: Index of Skills Needs Reflecting Changes in the Projected Staffing Pattern for Occupations in Industries With the Greatest Forecasted Long-Term Employment Growth, 2002 - 2012

	Index of Importance	
O*NET Skill	**2002**	**2012**
Active Listening	1.5	1.5
Speaking	1.5	1.5
Reading Comprehension	1.4	1.4
Problem Identification	1.3	1.3
Mathematics	1.3	1.3
Writing	1.3	1.3
Service Orientation	1.3	1.3
Information Gathering	1.2	1.2
Information Organization	1.2	1.2
Product Inspection	1.2	1.2
Coordination	1.2	1.2
Social Perceptiveness	1.2	1.2
Monitoring	1.2	1.2
Operation and Control	1.2	1.2
Equipment Selection	1.1	1.1
Solution Appraisal	1.1	1.1
Judgment and Decision Making	1.1	1.1
Identification of Key Causes	1.1	1.1
Critical Thinking	1.0	1.0
Time Management	1.0	1.0
Idea Evaluation	1.0	1.0
Active Learning	1.0	1.0
Implementation Planning	0.9	1.0
Idea Generation	0.9	0.9
Equipment Maintenance	0.9	0.9
Learning Strategies	0.9	0.9
Management of Material Resources	0.9	0.9
Operation Monitoring	0.9	0.9
Instructing	0.9	0.9
Visioning	0.9	0.9
Synthesis/Reorganization	0.9	0.9
Troubleshooting	0.8	0.9
Systems Perception	0.8	0.8
Repairing	0.8	0.8
Operations Analysis	0.8	0.8
Identifying Downstream Consequences	0.8	0.8
Installation	0.8	0.8
Management of Financial Resources	0.8	0.8
Systems Evaluation	0.8	0.8
Management of Personnel Resources	0.8	0.8
Persuasion	0.8	0.8
Science	0.8	0.8
Testing	0.8	0.8
Technology Design	0.7	0.7
Negotiation	0.7	0.7
Programming	0.5	0.5

Current and Projected Demographics of the Labor Pool

Tom Gallagher, Manager

Understanding current and projected characteristics of the labor market depends upon our ability to place Wyoming in an economic and demographic context, particularly the competition for labor. To base economic assumptions about the future only on the current period would fail to account for historical considerations which help define Wyoming's place in the U.S. economy. From 1994 to 1996, while the regional and national economies flourished, the number of persons who worked for any duration in the state declined. The external competition for Wyoming's labor diminished in 2000 as the nation's economy began to slow. However, as the nation emerges from recession, the external demand for Wyoming workers will grow.

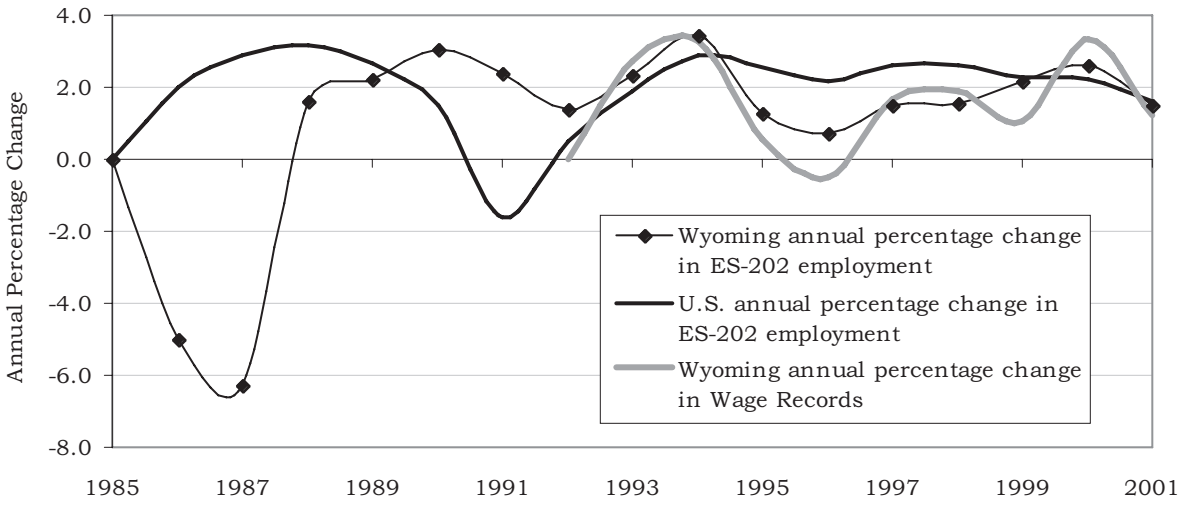
Following the energy bust of the early 1980s, employment opportunities in Wyoming began growing in 1988. Unemployment Insurance covered jobs grew at a rate of 1.1% to 3.5% per year from 1988 to 1994 and then fell (see Figure 1, page 60). Growth in employment stood at under 0.7% during 1997 and grew by an average of only 1.0% in 1998. Steady growth above 1.7%, due in large part to coal bed methane development, did not resume until 1999. The rate, pattern, and timing of employment growth in Wyoming are important in understanding which population segments (i.e., age, gender) remain intact as part of Wyoming's workforce or its potential workforce.

Employment growth began to accelerate in the nation in 1991, reached a peak of 2.9% in 1994, and remained at or above 2.1% in over-the-year growth through 2000. On a national basis, the competition for Wyoming's labor was most intense during the previous decade, a time when Wyoming's labor force was extremely vulnerable to competition from other states.

The baby boom generation was born between 1946 and 1964 (age 36 to 54 in 2000). Employment growth from 1988 to 1995 appears to have allowed individuals who are part of the boom generation (then age 33 to 49) to successfully establish themselves in Wyoming's labor market. However, the slowdown in job growth at mid-decade denied similar opportunities to those just outside the trailing edge of the boom generation (then age 25 to 32; see "Reallocation of the Workforce Through In-Migration" on page 69 for a cohort analysis of this population segment's interaction with Wyoming's market). Persons born between 1964 and 1980 (then age 15 to 29) entered Wyoming's labor market just as labor demand turned flat in 1995.

Job growth between 1990 and 2000 appears to have been substantial enough to produce job opportunities for those first among the boom generation on the labor market scene, but to have left less opportunity for those reaching young adulthood (the age most associated with migration) at mid-decade. Wyoming's labor market demonstrated little growth in 1995 and 1996, just as many people born between 1966 and 1980 (then age 15 to 29) were leaving high school, college, or attaining an age associated with the highest birth rates for females (Wyoming Department of Health, n.d.). Out-migration of persons attaining young adulthood during the mid-1990s, in response to a lack of economic opportunity, would explain the lower relative share of state

Figure 1: U.S. and Wyoming Annual Percentage Change in ES-202[a] and Wage Records[b] Employment, 1985 to 2001[c]



[a]A count of jobs reported as part of the Unemployment Insurance (UI) Covered Employment and Wages (ES-202) program.

[b]Wage Records is an administrative database of individuals earning wages for jobs covered by Unemployment Insurance.

[c]The annual percentage change in Wage Records is only reported from 1992 to 2001.

residents age 25 to 34 in 2000 in comparison to the nation as a whole. It would also help explain why there are 0.4 percentage points fewer children age five to nine and 0.5 percentage points fewer children under age five in Wyoming than in the nation as of the 2000 Decennial Census.

At the time of the Decennial Census, those younger (the 25 to 34 age segment) than the boom generation were present nationally in 2000 as 14.2% of the total population, but they were a lower percentage (12.1%) in Wyoming (see Table 1, page 61). At the same time, Wyoming has proportionately more persons (15.0% according to the 2000 Decennial Census) in the leading edge of the boom generation (the 45 to 54 age segment) than the nation as a whole (13.4%). There appear to be several potential consequences associated with the differential age distribution between Wyoming and the United States.

Sparsely populated states like Wyoming are likely to experience self-canceling population turnover, or interstate migration, with respect to any particular age segment if factors such as economic competition between states are equal. According to the 2000 Census, 8.4% of all U.S. residents age five and over were reported to have been a resident of another

Table 1: Resident Population by Age, 2000

	Wyoming		U.S.	
Age	Resident Population	Percentage	Resident Population	Percentage
Total	**493,782**	**100.0**	**281,421,906**	**100.0**
< 5	30,940	6.3	19,175,798	6.8
5 - 9	34,127	6.9	20,549,505	7.3
10 - 14	38,376	7.8	20,528,072	7.3
15 - 19	41,903	8.5	20,219,890	7.2
20 - 24	33,455	6.8	18,964,001	6.7
25 - 34	59,854	12.1	39,891,724	14.2
35 - 44	78,765	16.0	45,148,527	16.0
45 - 54	74,079	15.0	37,677,952	13.4
55 - 64	44,590	9.0	24,274,684	8.6
65 - 74	31,343	6.3	18,390,986	6.5
75 - 84	19,615	4.0	12,361,180	4.4
85 +	6,735	1.4	4,239,587	1.5
Median Age	**36.2**		**35.3**	

Source: U.S. Census Bureau, Census 2000, Table DP-1.

state in 1995. On the other hand, 15.7% of Wyoming's residents in 2000 were residents of another state in 1995 (U.S. Census Bureau, n.d.). On a net basis, even though in-migration to Wyoming was higher than the national average, out-migration among those between age 25 and 34 (in 2000) during the 1990s was far greater. In other words, Wyoming lost one out of seven adults age 25 to 34 to out-migration.

The differences in age distribution between Wyoming and the U.S. appear to offer partial explanations for population-related trends and suggest several potential consequences:

1. The precipitous decline in the number of families on welfare in Wyoming compared to the U.S. (U.S. Department of Health & Human Services, 2003) may partly be explained by the net out-migration of young families between 1995 and 2000.

2. The high level of nonresident participation in Wyoming's labor market may be attributed, in part, to the out-migration of young persons who might otherwise be found working in such highly seasonal industries as construction and tourism.

3. The leading edge of the boom generation (15.0% of Wyoming's population) will most likely need more health services (associated with maturity) on a per capita basis than the nation. On a proportional basis, health care costs may rise more quickly in Wyoming than the nation due, in part, simply to differences in demographics.

4. Areas of Wyoming's economy that expanded to serve the needs of the baby-

boomers and their children (e.g., retail clothing, recreation, child care, educational services) are decreasing in demand because of a smaller customer base, a direct result of the out-migration of 25- to 34-year-olds and their children in the 1990s. National franchises targeting the young may not be as profitable in Wyoming as in the rest of the nation.

5. Over the forecast period, the proportion of the state's labor force attaining near-retirement status will increase while the share of resident, potential new labor for Wyoming decreases. Workforce problems anticipated at the national level, which are the consequences of an aging workforce, are arriving more quickly and with a greater amplitude in Wyoming than nationally. The problems of a tighter labor supply and the need to integrate new workers successfully into the market are more pronounced in Wyoming. Consequently, the need for a more effective workforce development system increases.

6. Distinctions that define Wyoming as unique in its geography, economy, and adaptive social institutions must now also be viewed in light of the state's demography. With a unique demographic profile and setting, it seems clear that Wyoming's responses to national workforce development initiatives and policies (including labor market information programs) are best crafted by explicitly taking these factors into account.

Finally, steady growth during the middle of the last decade would have mitigated some of the current and anticipated economic and social stresses associated with the state's inability to retain the same relative share of its population age cohorts as they move from youth to adulthood. The costs and consequences of the state's inability during the last decade to retain those just beyond the trailing edge of the baby boom are confronting us today and over the forecast horizon.

References

U.S. Census Bureau. (n.d.) DP-2: Profile of selected social characteristics (Census 2000 Summary File 3). Retrieved November 22, 2002, from http://www.census.gov/Press-Release/www/2002/sumfile3.html

U.S. Department of Health & Human Services, Administration for Children & Families, Office of Family Assistance. (2003, April 7). *2002 TANF annual report to Congress.* Retrieved April 9, 2003, from http://www.acf.hhs.gov/programs/ofa/annualreport5/index.htm

Wyoming Department of Employment, Research & Planning. (2003, April). *Employment outlook 2010.* Casper, WY: Author.

Wyoming Department of Health, Preventive Health and Safety Division. (n.d.). *Wyoming vital statistics 2000.* Retrieved October 18, 2002, from http://wdh.state.wy.us/vital_records/00DATA/2000rept.pdf

Baseline Population Projections

Sylvia D. Jones, Senior Research Analyst

Table 1 was compiled from the U.S. Census Bureau Detailed State Projections by Single Year of Age (U.S. Census Bureau, 2002). Census estimates and projections are *point in time* measures (meaning they represent a single point in time rather than an annual average or a cumulative measure). In this case, the time period is July 1. Point in time measures are useful for showing overall change, however, they do little to explain the underlying dynamics of the labor force. The projections depicted in Figure 1 (see page 64) reflect the baseline population (B. McVeigh, personal conversation, March 24, 2005) and do not reflect the uncertainty of the current expansion in Wyoming.

Table 1: Population Projections by Age Group, 2000-2020

Year		Under 14	14-19	20-24	25-34	35-44	45-54	55-64	65+	Total
2000		104,697	51,069	39,596	65,058	78,825	76,370	47,265	61,820	524,700
2001		106,065	50,747	40,429	67,154	77,096	79,776	48,696	63,452	533,415
2002		107,635	50,248	41,051	69,430	75,248	81,119	52,227	65,150	542,108
2003		109,122	49,935	41,587	71,576	73,693	82,580	55,259	66,952	550,704
2004		110,348	50,250	41,752	73,339	72,646	83,816	58,252	68,806	559,209
2005		111,765	50,333	41,718	74,868	72,103	84,796	61,271	70,723	567,577
2000-2005	**N**	**7,068**	**-736**	**2,122**	**9,810**	**-6,722**	**8,426**	**14,006**	**8,903**	**42,877**
Change	**%**	**6.8**	**-1.4**	**5.4**	**15.1**	**-8.5**	**11.0**	**29.6**	**14.4**	**8.2**
2006		113,008	50,541	41,612	75,802	71,980	85,377	64,448	72,637	575,405
2007		114,519	50,775	41,296	77,101	71,753	85,377	67,844	74,779	583,444
2008		116,069	51,008	40,972	78,491	71,639	84,918	70,569	77,619	591,285
2009		117,544	51,129	41,061	79,615	71,647	84,136	73,574	80,203	598,909
2010		118,906	51,005	41,272	80,578	72,176	83,007	76,629	82,688	606,261
2011		120,196	50,988	41,490	81,502	72,945	81,476	79,878	84,914	613,389
2012		121,433	51,000	41,785	81,996	74,035	79,689	81,156	89,270	620,364
2005-2012	**N**	**8,425**	**459**	**173**	**6,194**	**2,055**	**-5,688**	**16,708**	**16,633**	**44,959**
Change	**%**	**7.5**	**0.9**	**0.4**	**8.2**	**2.9**	**-6.7**	**25.9**	**22.9**	**7.7**
2013		122,600	51,185	41,920	82,380	75,130	78,033	82,692	93,133	627,073
2014		123,689	51,463	41,856	82,788	76,092	76,729	84,032	96,992	633,641
2015		124,733	51,748	41,540	83,086	76,985	75,775	85,180	100,940	639,987
2016		125,825	52,129	41,347	83,467	77,697	75,210	86,073	104,999	646,747
2017		126,715	52,490	41,095	83,568	78,795	74,297	86,356	109,434	652,750
2018		127,540	52,865	41,010	83,517	80,078	73,414	86,191	113,937	658,552
2019		128,259	53,259	41,013	83,633	81,191	72,668	85,648	118,494	664,165
2020		128,929	53,693	41,017	83,558	82,192	72,523	84,711	123,000	669,623

Source: U.S. Census Bureau, Detailed State Projections by Single Year of Age, Sex, Race, and Hispanic Origin, 1995 to 2025 at http://www.census.gov/population/www/projections/stproj.html

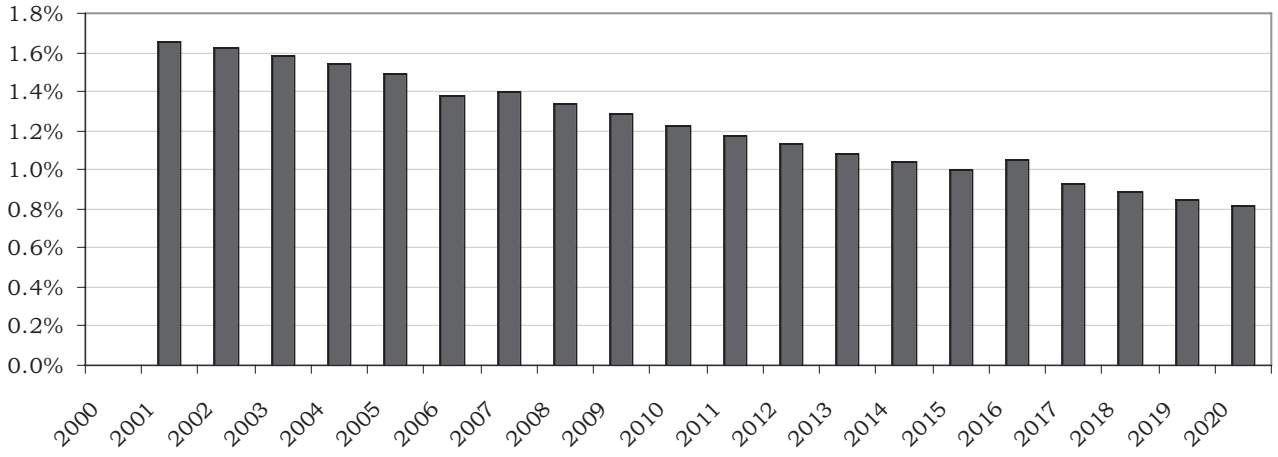
Two important issues are illustrated in Table 1 (see page 63). The first is the relative lack of growth in the younger age ranges. Between the years 2000 and 2005, the number of 14- to 19-year-olds was projected to decline. Between 2005 and 2012, that same age group is projected to grow, but at a rate of less than 1%. Growth is similarly small for those age 20 to 24. Those in the next age group (25 to 34) show strong growth of about 15% until 2005, but then the rate decreases to just over 8% during the period 2005-2012.

Youth migration is a widely discussed issue in Wyoming. Many studies have indicated that younger residents are leaving the state (Jones, 2004a; Harris, 2004). However, the population for these age groups is remaining relatively stable. This topic is discussed in "Labor Retention: Out-Migration of Youth" on page 75.

The slow growth of the youth population could have major implications on Wyoming's economy over the next several years. The supply of young workers tends to be concentrated in Accommodation & Food Services, Retail Trade, Mining, Construction, Health Care & Social Assistance, Educational Services, Administrative Support, and Manufacturing. Without an adequate supply of upcoming labor, these industries could become exposed to production limitations, even without the projected growth. For example, if the pool of workers for a fast food restaurant is only large enough to support one establishment, then the town will only have one, regardless of the customer base that could support more, unless alternative sources of labor are tapped.

The Construction industry is more dependent upon 25- to 34-year-old men than is any other major industry. Men comprised 42.4% of the state's workforce (earning an average of $30,855), while they made up 59.0% of the employment in the Construction industry (earning $23,916;

Figure 1: Annual Percentage Change in Wyoming Projected Population Growth, 2000-2020



Source: U.S. Census Bureau, Detailed State Projections by Single Year of Age, Sex, Race, and Hispanic Origin: 1995 to 2025. http://www.census.gov/population/www/projections/stproj.html

Jones, 2004b). The greater reliance on this age group in Construction and the substantial earnings differential (29.0%) between Construction and the balance of the market, make the Construction industry vulnerable to a slowing supply of labor and an increased competition for those who remain. As discussed in "Tools for Identifying Critical Occupations" on page 37, the 25- to 34-year-old men who currently work in Construction may potentially be recruited by faster growing, higher paying industries such as oil & gas extraction because of the skills overlap. With a declining number of replacement workers, Construction may be forced to either increase wages, hire more nonresident labor, or ultimately fail to meet the growing demands for construction work in the state.

Another issue is the decline in 35- to 44-year-olds between 2000 and 2005 and the subsequent decrease in 45- to 54-year-olds from 2005 to 2012. This is a reflection of the beginning of the youth exodus in the mid-1990s and continues to carry over into the future.

Finally, the majority of growth projected to occur in Wyoming between 2000 and 2020 is found in the 55-64 and the Over 65 age groups. Wyoming's high percentage of residents in this age group can be largely attributed to the in-migration of younger workers during the energy boom of the 1970s (Liu, 2003). As that cohort ages, they increase the median age of Wyoming's population and bring the economic and social issues faced by an older population.

References

Harris, M. A. (2004, October). Work activity of community college graduates one year after graduation. *Wyoming Labor Force Trends*. Retrieved May 16, 2005, from http://doe.state.wy.us/LMI/1004/1004.pdf

Jones, S. D. (2004a, August). Age as a predictor of workforce retention. *Wyoming Labor Force Trends*. Retrieved May 16, 2005, from http://doe.state.wy.us/LMI/0804/a1.htm

Jones, S. D. (2004b). *Earnings by age, gender & industry: 1994 - 2003*. Retrieved May 16, 2005, from http://doe.state.wy.us/LMI/wfdemog/toc3.htm

Liu, W. (2003). Wyoming's resident population: Historical and projected data. In S. Murray & K. R. Shinkle (Eds.). *Employment Outlook: 2010*. Casper, WY: Wyoming Department of Employment, Research & Planning.

U.S. Census Bureau (2002). *Detailed state projections by single year of age, sex, race, and Hispanic origin: 1995 to 2025*. Retrieved May 16, 2005, from http://www.census.gov/population/www/projections/stproj.html

Reallocation of the Workforce Through In-Migration

Tony Glover, Senior Research Analyst

Nonresident labor has traditionally been a component of Wyoming's employment. This article explores the orgin and destination of persons employed in Wyoming.

Table 1 was produced by combining Wyoming's Wage Records data with recently developed resident/nonresident classifications. From 1992 to 1998 and 1999 to 2003, 15.2% and 18.8%, respectively, of Wyoming's employment were nonresidents. Rapid employment growth from 1999 to 2003 resulted in a 3.6 percentage point increase in the proportion of nonresidents employed in Wyoming. While the difference of 3.6% seems small, it amounts to approximately 11,000 nonresident workers (roughly the population size of Evanston) in Wyoming's labor market at some point during the year.

Table 2 and Figure 1 (see pages 68 and 69, respectively) display the same information. The highest year of nonresident employment from Table 1 was 2001. In 2001 there were 64,046 nonresidents employed in Wyoming. In this section, we discuss where these workers came from and where they went.

During 2001 there were 323,901 persons employed in Wyoming, 64,046 nonresidents and 259,855 residents. Figure 1 presents a timeline with the left hand side representing the origin (in 2000) of those employed in Wyoming in 2001 and the right side representing their destination in 2002.

Of the 64,046 nonresidents employed in Wyoming in 2001, 17,296 were employed in Wyoming in 2000, 12,477 worked in

Table 1: Number of Individuals Employed in Wyoming by Residency Status, 1992 - 2003

	Nonresidents				Residents				Total			
	Employment		Change from Previous Year		Employment		Change from Previous Year		Employment		Change from Previous Year	
Year	N	%	N	%	N	%	N	%	N	%	N	%
1992	41,477	15.5%	--	--	226,002	84.5%	--	--	267,479	100.0%	--	--
1993	39,542	14.6%	-1,935	-4.7%	232,143	85.4%	6,141	2.7%	271,685	100.0%	4,206	1.6%
1994	40,702	14.5%	1,160	2.9%	239,923	85.5%	7,780	3.4%	280,625	100.0%	8,940	3.3%
1995	41,366	14.7%	664	1.6%	240,124	85.3%	201	0.1%	281,490	100.0%	865	0.3%
1996	43,102	15.2%	1,736	4.2%	240,754	84.8%	630	0.3%	283,856	100.0%	2,366	0.8%
1997	43,908	15.3%	806	1.9%	243,392	84.7%	2,638	1.1%	287,300	100.0%	3,444	1.2%
1998	49,393	16.7%	5,485	12.5%	246,412	83.3%	3,020	1.2%	295,805	100.0%	8,505	3.0%
1999	58,680	19.2%	9,287	18.8%	247,310	80.8%	898	0.4%	305,990	100.0%	10,185	3.4%
2000	57,198	18.6%	-1,482	-2.5%	251,099	81.4%	3,789	1.5%	308,297	100.0%	2,307	0.8%
2001	64,046	19.8%	6,848	12.0%	259,855	80.2%	8,756	3.5%	323,901	100.0%	15,604	5.1%
2002	57,745	18.2%	-6,301	-9.8%	260,273	81.8%	418	0.2%	318,018	100.0%	-5,883	-1.8%
2003	60,647	18.7%	2,902	5.0%	263,025	81.3%	2,752	1.1%	323,672	100.0%	5,654	1.8%

Table 2: Number of Individuals Employed in Wyoming in 2001 by State of Origin in 2000 and Destination in 2002

State of Origin - 2000[b]	Worked in Wyoming in 2001[a] Resident[c] N	%	Nonresident[c] N	%	Total N	%	Worked in Wyoming in 2001[a] Resident[c] N	%	Nonresident[c] N	%	Total N	%	Destination State - 2002[b]
Employment Status and Whereabouts Unknown in 2000[d]	31,985	9.9%	34,273	10.6%	66,258	20.5%	26,583	8.2%	29,020	9.0%	55,603	17.2%	Employment Status and Whereabouts Unknown in 2002[d]
Partner Research State in 2000[c]	11,930	3.7%	12,477	3.9%	24,407	7.5%	12,786	3.9%	15,918	4.9%	28,704	8.9%	Partner Research State in 2002[c]
Wyoming in 2000	215,940	66.7%	17,296	5.3%	233,236	72.0%	220,486	68.1%	19,108	5.9%	239,594	74.0%	Wyoming in 2002
Total	**259,855**	**80.2%**	**64,046**	**19.8%**	**323,901**	**100.0%**	**259,855**	**80.2%**	**64,046**	**19.8%**	**323,901**	**100.0%**	**Total**

[a]Includes all SSNs that appeared in Wyoming's Wage Records in the year 2001.
[b]State of Origin and Destination State represent the states paying the individual (unique SSN) the most wages in 2000 (Origin) and 2002 (Destination).
[c]Resident and Nonresident status is determined using a methodology developed by Wyoming and our partner research states (AK, NE, NM, OH, SD) in the LAUS-AAMC project. As the methodology is refined, the numbers of SSNs determined Residents and Nonresidents may change slightly.
[d]Individuals (unique SSNs) who worked in Wyoming in 2001 for whom we had no wage data in 2000 (Origin) or 2002 (Destination). For example, the individual (SSN) could have worked in California (a state from which we do not currently collect wage data) or the individual (SSN) could have resided in Wyoming but had no wages here.
[e]A Partner Research State is a state from which R&P collects wage records data. Included in this analysis are data from Colorado, Idaho, Montana, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Utah.

one of our partner research states in 2000, and 34,273 were classified with a State of Origin as Employment Status and Whereabouts Unknown in 2000. Independent of residency status, 24,407 persons employed in Wyoming in 2001 originated in one of our partner research states and 66,258 had an origin of Employment Status and Whereabouts Unknown. This means that of the total 323,901 persons working in Wyoming in 2001, 90,665 or 28.0% did not work in Wyoming in 2000.

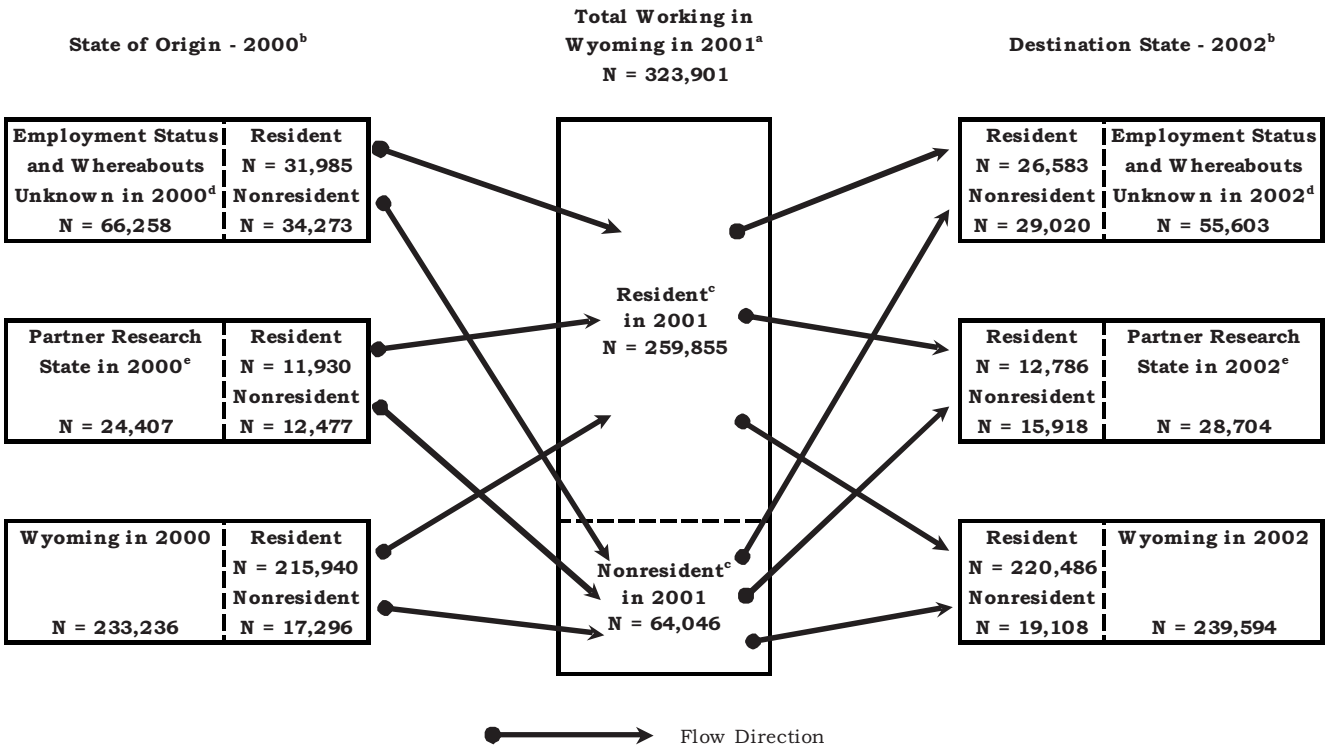
A large portion of those employed in Wyoming in 2001 did not continue working in Wyoming in 2002. There were 55,603 persons classified as Employment Status and Whereabouts Unknown in 2002 and 28,704 persons who were working in research partner states for a total of 84,307 persons. In other words, 26.0% of those employed in Wyoming in 2001 were not employed in Wyoming in 2002.

Even though we have a large portion of transient employment in Wyoming, we retained a share of these workers. We added 90,665 to our labor market from 2000 to 2001 and lost 84,307 from 2001 to 2002, which gave us a net gain of 6,358.

Reallocation of the Workforce Through Expanded Commuting and Geographic Relocation

Faced with rapid employment growth and a need to build an infrastructure to maintain, attract, and retain businesses and support economic development, localities need information for prospective employers considering relocation. Often, their needs revolve around available labor and how much will it cost. In order to answer this question, R&P uses information from two Unemployment Insurance (UI) tax sources (Wage Records and the Quarterly Census of Employment and Wages [QCEW]) and the Wyoming

Figure 1: Number of Individuals Employed in Wyoming in 2001 by State of Origin in 2000 and Destination in 2002



[a]Includes all SSNs that appeared in Wyoming's Wage Records in the year 2001.
[b]State of Origin and Destination State represent the states paying the individual the most wages in 2000 (Origin) and 2002 (Destination).
[c]Resident and Nonresident status is determined using a methodology developed by Wyoming and our partner research states (OH, AK, NE, NM, SD) in the LAUS-AAMC project. As the methodology is refined, the numbers of SSNs determined Residents and Nonresidents may change slightly.
[d]Individuals who worked in Wyoming in 2001 for whom we had no wage data in 2000 (Origin) or 2002 (Destination). For example, the individual could have worked in California (a state from which we do not currently collect wage data) or the individual could have resided in Wyoming but had no wages here.
[e]A Partner Research State is a state from which R&P collects wage records data. Included in this analysis are data from Colorado, Nebraska, South Dakota, Montana, Idaho, Utah, New Mexico, Texas, and Oklahoma.

Driver's License database. The Driver's License database was used to determine each worker's place of residence and to identify worker commuting patterns.

R&P was recently asked for data to support infrastructure development in Wyoming's Northeast Region. More specifically the North East Wyoming Economic Development Coalition (NEWEDC) asked for a time series demonstrating the growth in the number of persons commuting from Crook County to Campbell County. While Campbell County is experiencing rapid employment growth due to expansion in the oil and gas

(Text continued on page 71)

Table 3: Persons Employed in Campbell County by Origin of Residence, 1992Q1 - 2004Q3

		Employment in Campbell County (Inflow)					
			Campbell County Residents		Nonresident Commuters[a]		Commuters From Crook to
Year	Quarter	Total	N	%	N	%	Campbell County[b]
1992	1	15,646	12,680	81.0%	2,966	19.0%	251
	2	16,575	13,240	79.9%	3,335	20.1%	274
	3	16,811	13,335	79.3%	3,476	20.7%	285
	4	16,579	13,054	78.7%	3,525	21.3%	265
1993	1	15,804	12,680	80.2%	3,124	19.8%	260
	2	16,699	13,341	79.9%	3,358	20.1%	290
	3	17,803	13,684	76.9%	4,119	23.1%	302
	4	17,087	13,261	77.6%	3,826	22.4%	279
1994	1	16,427	13,085	79.7%	3,342	20.3%	277
	2	17,330	13,690	79.0%	3,640	21.0%	313
	3	17,967	13,922	77.5%	4,045	22.5%	329
	4	17,109	13,382	78.2%	3,727	21.8%	298
1995	1	16,633	13,301	80.0%	3,332	20.0%	277
	2	17,502	13,861	79.2%	3,641	20.8%	302
	3	17,968	13,972	77.8%	3,996	22.2%	304
	4	17,405	13,543	77.8%	3,862	22.2%	309
1996	1	16,808	13,231	78.7%	3,577	21.3%	315
	2	17,874	14,073	78.7%	3,801	21.3%	376
	3	18,779	14,378	76.6%	4,401	23.4%	384
	4	18,096	13,899	76.8%	4,197	23.2%	368
1997	1	17,103	13,569	79.3%	3,534	20.7%	329
	2	18,078	14,256	78.9%	3,822	21.1%	364
	3	19,174	14,645	76.4%	4,529	23.6%	367
	4	18,243	14,200	77.8%	4,043	22.2%	327
1998	1	17,714	14,024	79.2%	3,690	20.8%	324
	2	18,755	14,723	78.5%	4,032	21.5%	365
	3	19,314	14,956	77.4%	4,358	22.6%	370
	4	18,376	14,430	78.5%	3,946	21.5%	374
1999	1	17,784	14,225	80.0%	3,559	20.0%	362
	2	19,342	15,072	77.9%	4,270	22.1%	409
	3	20,430	15,506	75.9%	4,924	24.1%	444
	4	19,779	15,307	77.4%	4,472	22.6%	439
2000	1	19,868	15,359	77.3%	4,509	22.7%	457
	2	20,710	16,081	77.6%	4,629	22.4%	504
	3	21,496	16,421	76.4%	5,075	23.6%	519
	4	20,723	15,929	76.9%	4,794	23.1%	504
2001	1	20,665	16,062	77.7%	4,603	22.3%	536
	2	22,665	16,790	74.1%	5,875	25.9%	618
	3	24,186	17,162	71.0%	7,024	29.0%	658
	4	22,863	16,790	73.4%	6,073	26.6%	654
2002	1	22,504	17,016	75.6%	5,488	24.4%	659
	2	23,426	17,574	75.0%	5,852	25.0%	659
	3	23,635	17,644	74.7%	5,991	25.3%	641
	4	22,111	16,790	75.9%	5,321	24.1%	612
2003	1	21,538	16,667	77.4%	4,871	22.6%	603
	2	22,869	17,472	76.4%	5,397	23.6%	638
	3	23,815	17,689	74.3%	6,126	25.7%	671
	4	23,154	17,318	74.8%	5,836	25.2%	648
2004	1	22,753	17,158	75.4%	5,595	24.6%	652
	2	23,762	17,668	74.4%	6,094	25.6%	690
	3	24,450	17,579	71.9%	6,871	28.1%	682

[a]Total number of individuals working in Campbell County who either reside in another county in Wyoming (including Crook County) or whose residence is not available.

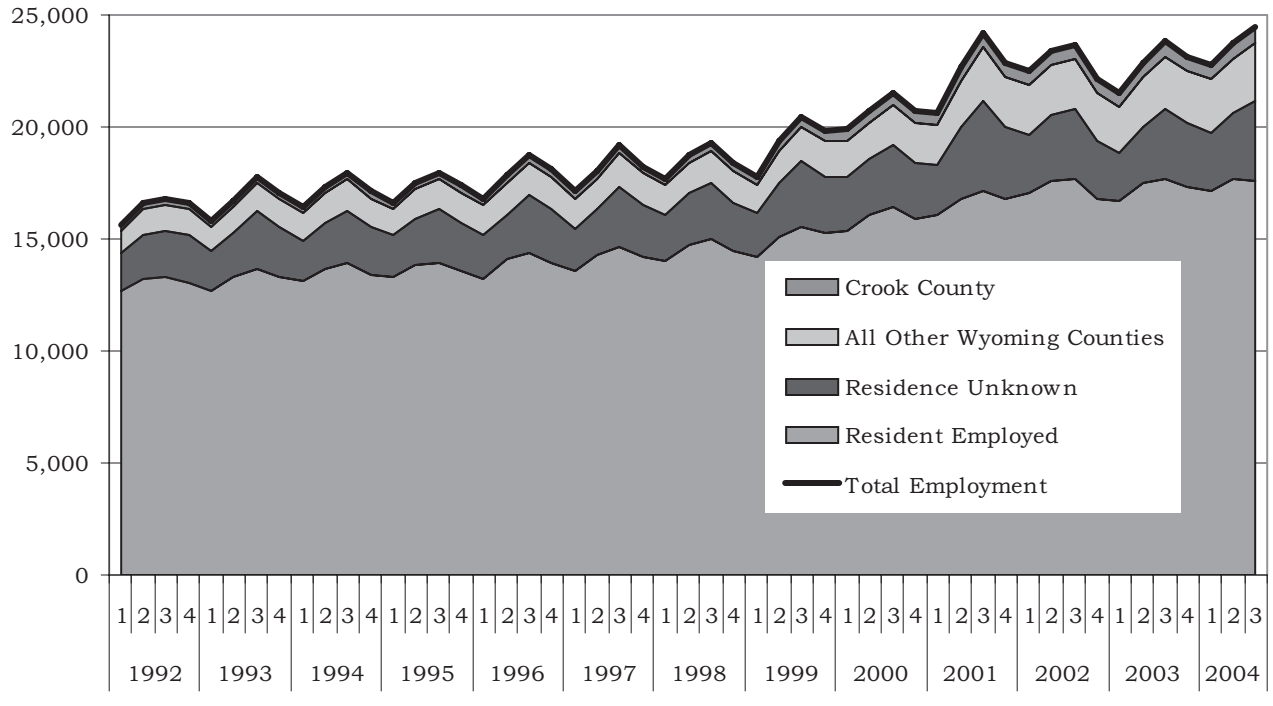
[b]Total number of individuals working in Campbell County who reside in Crook County.

industry (coal-bed methane development), a large percentage of the labor fueling this growth resides elsewhere. The populations of communities in Crook County, like Moorcroft and Pine Haven, are growing to support their neighboring county's economic expansion. This growth is occurring with an absence of funding to develop the necessary infrastructure (e.g., roads and sanitation).

Table 3 (see page 70) shows persons employed in Campbell County by their origin of residence from 1992Q1 to 2004Q3. After reviewing the far right column of those residing in Crook County and working in Campbell County, it is clear that the number has more than doubled over the decade (1995 to 2004). In 2001, the percentage of persons working in Campbell County who resided elsewhere hit an all time high of 7,024 persons or 29.0%. The 7,024 commuters include the 658 commuting between Crook and Campbell counties and a large percentage of persons who work in Campbell County, but whose residence is unknown. It is possible that with a housing shortage in the Gillette area (Payne, 2001) some of the persons with unknown residences (in addition to the 658 identified) may reside in the Moorcroft and Pine Haven communities in Crook County.

Figure 2 shows the data from Table 3 with expanded residence categories. A review of Figure 2 reveals that Campbell County has experienced relatively steady Resident Employed employment growth over the past 13 years. It also shows the corresponding steady growth in the use of labor from

Figure 2: Persons Employed in Campbell County by Origin of Residence, 1992Q1 to 2004Q3



surrounding counties. There was dramatic growth in the number of those employed in Campbell County with unknown residences (mostly nonresidents recently relocating to Campbell and surrounding counties) during the years 2001 to 2004.

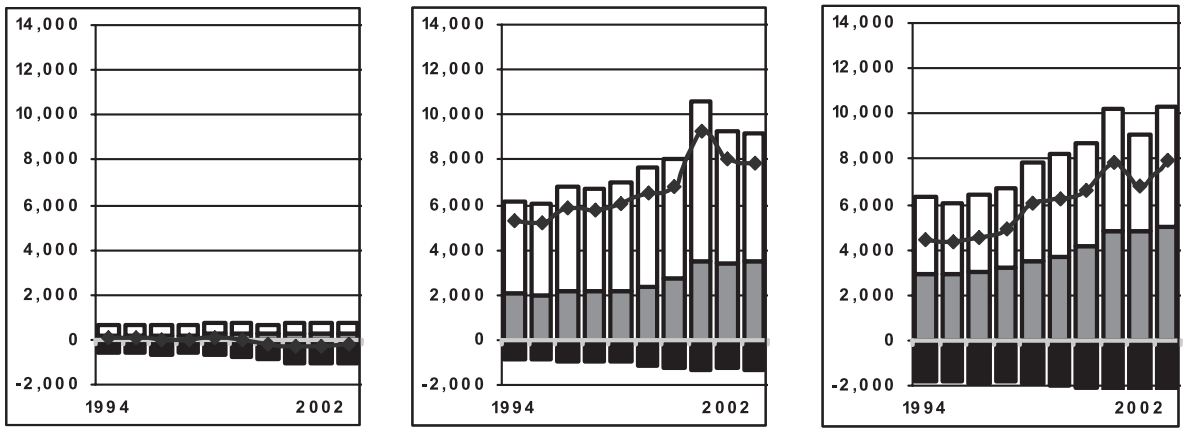
As Figure 2 shows, a common place of work and place of residence represents the single largest share of workers in Campbell County. However, not only do workers commute to Campbell County but a share of Campbell County residents commute to locations outside the county.

Inflow and outflow commuting features are identified in Figure 3 (see page 73), which provides three examples of commuting patterns (Natrona, Campbell, and Crook). Commuting pattern data are currently available for all counties in Wyoming. Referring to the graph of Natrona County, a bar is given for each year from 1994 to 2003. The bars above the zero line represent the total inflow. The gray bar represents Wyoming residents from other counties who commute to Natrona County to work, while the white bar represents nonresident commuters to Natrona County. Outflow from Natrona County appears as bars below the zero line and represent persons residing in Natrona County but who are employed in another county in Wyoming. The line graph portion connecting the diamonds near the top of the inflow bars represents Natrona County's Net Flow or the Inflow minus the Outflow. In contrast to Natrona County, Crook County has a negative Net Flow with a large portion of its population commuting to Campbell County. It should be noted that the factors influencing employment growth in Natrona County are also influencing Campbell County.

References

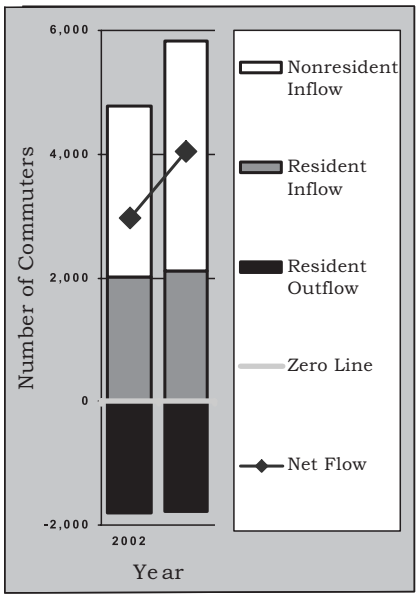
Payne, B. (2001, June). An analysis of growth in housing stock and population: 1990-2000. *Wyoming Labor Force Trends*. Retrieved May 17, 2005, from http://doe.state.wy.us/LMI/0601/a2.htm

Figure 3: Wyoming Resident/Nonresident Inflow, Outflow, and Net Flow by County, 1994 - 2003



Crook Campbell Natrona

Legend



Notes

Nonresident Inflow: Persons employed in the county who have not acquired a Wyoming driver's license. For example, a short-term employee who works in Campbell County but never gets a Wyoming driver's license.

Resident Inflow: Persons employed in the county who have a Wyoming driver's license from another county. For example, a person who works in Campbell County but lives in Crook County.

Resident Outflow: Persons employed in another county who have a Wyoming driver's license in this county. For example, a person who lives in Campbell County but works in Natrona County.

Net Flow: (Nonresident Inflow + Resident Inflow) - Resident Outflow

Labor Retention: Out-Migration of Youth

Sylvia D. Jones, Senior Research Analyst

Following a cohort of Wyoming workers through the labor market over a period of time is a different method of examining the issues of how labor is allocated and retained in the state. As seen in Table 1 from "Baseline Population Projections" on page 65, the number of individuals age 18 to 24 has stayed, and is expected to stay, relatively constant. Large growth is not expected as the cohort moves into the next age bracket either. This means that either the same group of people are staying and working in Wyoming or they are being replaced as quickly as they leave. Census Bureau estimates cannot provide the answer to the question about migration and replacement. Matching Wyoming Wage Records to demographic information provides a richer description of the underlying labor market dynamics.

Cohort Analysis

Cohort analysis tracks the same population over time. In this section, we tracked all individuals with UI earnings in 1993 through 2003. Persons may not have earnings because they were unemployed (but still in the market), withdrew from the market (e.g., for family responsibilities), became employed in a non-UI covered industry (e.g., production agriculture), or left the state.

Tables 1, 2, and 3 (see pages 76, 77, and 78, respectively) illustrate the work experiences of a cohort of individuals who were age 18 to 24 and worked in Wyoming at some point during 1993. There were a total of 44,873 people who met this criteria and were included in the analysis. Of the total, 21,920 were women and 22,953 were men.

Table 1 focuses on women only. In 1993, the largest proportions worked in Accommodation & Food Services (32.6%), Retail Trade (22.9%), and Health Care & Social Assistance (10.6%). In 1995 members of the group were age 20-26 and 34.3% of the original cohort of women were no longer working in the Wyoming workforce (see Figure 1, page 77.) Accommodation & Food Services, Retail Trade, and Health Care & Social Assistance still employed the largest percentage of remaining female workers, however, those percentages dropped to 16.1, 14.2, and 9.7%, respectively, compared to 1993. By 2003, when the cohort reached the ages of 28-34, almost 60% of the women who were working in 1993 were no longer employed in Wyoming's covered industries. Health Care & Social Assistance and Educational Services employed the largest number of the remaining workers (8.2% and 5.6%, respectively). In other words, nearly 60% of women who were 18-24 in 1993 no longer worked in Wyoming 11 years later. The industries which lost the most workers were also the ones which paid the least and offered the fewest benefits (see Cowan, Hauf, & Leonard, 2005).

Similar trends can be seen in the data for men (see Table 2, page 75). By the end of the tracking period, 53.5% of the original cohort of men were not working in the Wyoming labor market (see Figure 1). The biggest difference in the work behavior displayed in these tables is in the distribution of industries. As previously stated, women in the younger age groups were concentrated in Accommodation & Food Services, Retail Trade, and Health Care & Social Assistance. Concentrations of young men, however, were found in Accommodation & Food Services

Table 1: Women Age 18-24 in 1993 Tracked in Wyoming's Labor Market Until 2003 by Industry

Industry	1993 (18-24) n	%	1995 (20-26) n	%	1997 (22-28) n	%	1999 (24-30) n	%	2001 (26-32) n	%	2003 (28-34) n	%
No Wages	0	0.0	7,524	34.3	10,201	46.5	11,656	53.2	12,553	57.3	13,112	59.8
Agriculture	93	0.4	57	0.3	57	0.3	36	0.2	40	0.2	32	0.1
Mining	214	1.0	184	0.8	171	0.8	128	0.6	167	0.8	176	0.8
Utilities	21	0.1	17	0.1	11	0.1	9	0.0	16	0.1	19	0.1
Construction	270	1.2	235	1.1	218	1.0	242	1.1	233	1.1	200	0.9
Manufacturing	494	2.3	382	1.7	291	1.3	249	1.1	208	0.9	179	0.8
Wholesale Trade	218	1.0	181	0.8	181	0.8	171	0.8	159	0.7	139	0.6
Retail Trade	5,009	22.9	3,110	14.2	2,189	10.0	1,711	7.8	1,431	6.5	1,214	5.5
Transportation & Warehousing	126	0.6	116	0.5	110	0.5	130	0.6	131	0.6	126	0.6
Information	379	1.7	236	1.1	224	1.0	241	1.1	218	1.0	197	0.9
Finance & Insurance	584	2.7	498	2.3	502	2.3	510	2.3	475	2.2	467	2.1
Real Estate & Rental & Leasing	385	1.8	225	1.0	194	0.9	157	0.7	152	0.7	149	0.7
Professional & Technical Services	491	2.2	405	1.8	383	1.7	359	1.6	377	1.7	350	1.6
Mgmt. of Companies & Enterprises	3	0.0	3	0.0	3	0.0	5	0.0	12	0.1	4	0.0
Administrative & Support Services	934	4.3	627	2.9	569	2.6	515	2.3	435	2.0	374	1.7
Educational Services	1,101	5.0	898	4.1	1,087	5.0	1,168	5.3	1,219	5.6	1,219	5.6
Heath Care and Social Assistance	2,318	10.6	2,137	9.7	1,896	8.6	1,867	8.5	1,762	8.0	1,799	8.2
Arts, Entertainment, & Recreation	348	1.6	212	1.0	125	0.6	99	0.5	84	0.4	82	0.4
Accommodation & Food Services	7,141	32.6	3,528	16.1	2,348	10.7	1,587	7.2	1,188	5.4	1,011	4.6
Other Services	664	3.0	513	2.3	435	2.0	367	1.7	318	1.5	304	1.4
Public Administration	1,038	4.7	803	3.7	688	3.1	699	3.2	720	3.3	741	3.4
Unclassified	89	0.4	29	0.1	37	0.2	14	0.1	22	0.1	26	0.1
Total	**21,920**	**100.0**	**21,920**	**100.0**	**21,920**	**100.0**	**21,920**	**100.0**	**21,920**	**100.0**	**21,920**	**100.0**

(19.3%), Retail Trade (16.9%), and Construction (16.0%) in 1993. At the end of the tracking period, men were concentrated in Construction (8.5%) and Mining (7.0%), suggesting that individuals gain experience in a lower paying industry (Accommodation & Food Services) and then use those skills to move into a higher paying industry (Mining) or leave the market.

Table 3 (see page 78) tracked all workers by industry over the same period. The most important observation is that by the end of the 11-year tracking period, 56.6% of the youth who worked in 1993 were no longer employed in Wyoming. This finding supports those from other research on youth out-migration.

Even though most of the young of 1993 have left Wyoming's labor market, new workers born in the state and in-migrants have filled the 18- to 24-year-old gap. Table 4 (see page 79) shows the industry distribution of those in the age group (18-24) in 2003. The total for this cohort is remarkably similar to the 1993 cohort (44,540 compared to 44,873, respectively). Apparently, the available labor pool has thus far remained stable. This observation is consistent with the Census Bureau's estimates and population projections.

The industry distribution of employment remained fairly stable as well between the two time periods. Women were working primarily in Accommodation & Food Services and the men were working in Construction, Retail Trade, and Accommodation & Food Services. With some notable exceptions, job opportunities for youth seem to be similar in both 1993 and 2003.

Table 5 (see page 79) compares the total

(Text continued on page 78)

Table 2: Men Age 18-24 in 1993 Tracked in Wyoming's Labor Market Until 2003 by Industry

Industry	1993 (18-24) n	%	1995 (20-26) n	%	1997 (22-28) n	%	1999 (24-30) n	%	2001 (26-32) n	%	2003 (28-34) n	%
No Wages	0	0.0	7,040	30.7	9,292	40.5	10,870	47.4	11,641	50.7	12,279	53.5
Agriculture	501	2.2	244	1.1	193	0.8	156	0.7	134	0.6	114	0.5
Mining	1,580	6.9	1,290	5.6	1,365	5.9	1,281	5.6	1,694	7.4	1,606	7.0
Utilities	56	0.2	50	0.2	49	0.2	48	0.2	64	0.3	97	0.4
Construction	3,662	16.0	2,908	12.7	2,619	11.4	2,410	10.5	2,190	9.5	1,943	8.5
Manufacturing	1,244	5.4	1,064	4.6	962	4.2	852	3.7	711	3.1	644	2.8
Wholesale Trade	624	2.7	599	2.6	573	2.5	534	2.3	575	2.5	583	2.5
Retail Trade	3,881	16.9	2,495	10.9	1,839	8.0	1,467	6.4	1,220	5.3	1,080	4.7
Transportation & Warehousing	553	2.4	465	2.0	465	2.0	473	2.1	419	1.8	430	1.9
Information	276	1.2	236	1.0	195	0.8	241	1.0	208	0.9	186	0.8
Finance & Insurance	108	0.5	94	0.4	134	0.6	114	0.5	132	0.6	129	0.6
Real Estate & Rental & Leasing	311	1.4	217	0.9	204	0.9	158	0.7	164	0.7	155	0.7
Professional & Technical Services	365	1.6	310	1.4	292	1.3	327	1.4	335	1.5	344	1.5
Mgmt. of Companies & Enterprises		0.0		0.0	1	0.0	4	0.0	9	0.0	7	0.0
Administrative & Support Services	1,190	5.2	712	3.1	616	2.7	512	2.2	389	1.7	374	1.6
Educational Services	744	3.2	476	2.1	611	2.7	571	2.5	543	2.4	538	2.3
Heath Care and Social Assistance	605	2.6	569	2.5	467	2.0	414	1.8	413	1.8	379	1.7
Arts, Entertainment, & Recreation	394	1.7	266	1.2	193	0.8	138	0.6	112	0.5	112	0.5
Accommodation & Food Services	4,431	19.3	2,268	9.9	1,477	6.4	1,063	4.6	754	3.3	645	2.8
Other Services	802	3.5	618	2.7	478	2.1	406	1.8	368	1.6	342	1.5
Public Administration	1,290	5.6	967	4.2	834	3.6	870	3.8	840	3.7	918	4.0
Unclassified	336	1.5	65	0.3	94	0.4	44	0.2	38	0.2	48	0.2
Total	**22,953**	**100.0**	**22,953**	**100.0**	**22,953**	**100.0**	**22,953**	**100.0**	**22,953**	**100.0**	**22,953**	**100.0**

Figure 1: Percent of Wyoming Resident Workers (18-24 Years of Age in 1993) Who Had No Wage Record by Gender, 1993 - 2003

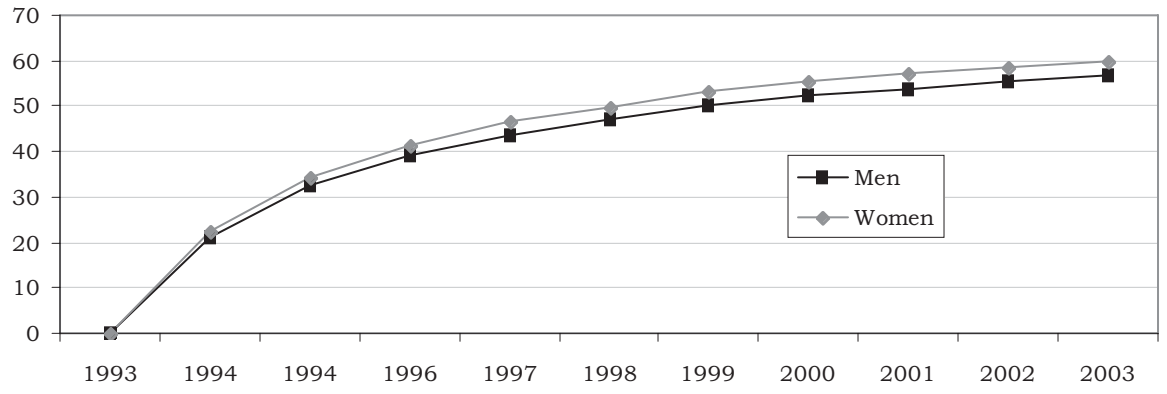


Table 3: All Workers Age 18-24 in 1993 Tracked in Wyoming's Labor Market Until 2003 by Industry

Industry	1993 (18-24) n	%	1995 (20-26) n	%	1997 (22-28) n	%	1999 (24-30) n	%	2001 (26-32) n	%	2003 (28-34) n	%
No Wages	0	0.0	14,564	32.5	19,493	43.4	22,526	50.2	24,194	53.9	25,391	56.6
Agriculture	594	1.3	301	0.7	250	0.6	192	0.4	174	0.4	146	0.3
Mining	1,794	4.0	1,474	3.3	1,536	3.4	1,409	3.1	1,861	4.1	1,782	4.0
Utilities	77	0.2	67	0.1	60	0.1	57	0.1	80	0.2	116	0.3
Construction	3,932	8.8	3,143	7.0	2,837	6.3	2,652	5.9	2,423	5.4	2,143	4.8
Manufacturing	1,738	3.9	1,446	3.2	1,253	2.8	1,101	2.5	919	2.0	823	1.8
Wholesale Trade	842	1.9	780	1.7	754	1.7	705	1.6	734	1.6	722	1.6
Retail Trade	8,890	19.8	5,605	12.5	4,028	9.0	3,178	7.1	2,651	5.9	2,294	5.1
Transportation & Warehousing	679	1.5	581	1.3	575	1.3	603	1.3	550	1.2	556	1.2
Information	655	1.5	472	1.1	419	0.9	482	1.1	426	0.9	383	0.9
Finance & Insurance	692	1.5	592	1.3	636	1.4	624	1.4	607	1.4	596	1.3
Real Estate & Rental & Leasing	696	1.6	442	1.0	398	0.9	315	0.7	316	0.7	304	0.7
Professional & Technical Services	856	1.9	715	1.6	675	1.5	686	1.5	712	1.6	694	1.5
Mgmt. of Companies & Enterprises	3	0.0	3	0.0	4	0.0	9	0.0	21	0.0	11	0.0
Administrative & Support Services	2,124	4.7	1,339	3.0	1,185	2.6	1,027	2.3	824	1.8	748	1.7
Educational Services	1,845	4.1	1,374	3.1	1,698	3.8	1,739	3.9	1,762	3.9	1,757	3.9
Heath Care and Social Assistance	2,923	6.5	2,706	6.0	2,363	5.3	2,281	5.1	2,175	4.8	2,178	4.9
Arts, Entertainment, & Recreation	742	1.7	478	1.1	318	0.7	237	0.5	196	0.4	194	0.4
Accommodation & Food Services	11,572	25.8	5,796	12.9	3,825	8.5	2,650	5.9	1,942	4.3	1,656	3.7
Other Services	1,466	3.3	1,131	2.5	913	2.0	773	1.7	686	1.5	646	1.4
Public Administration	2,328	5.2	1,770	3.9	1,522	3.4	1,569	3.5	1,560	3.5	1,659	3.7
Unclassified	425	0.9	94	0.2	131	0.3	58	0.1	60	0.1	74	0.2
Total	**44,873**	**100.0**	**44,873**	**100.0**	**44,873**	**100.0**	**44,873**	**100.0**	**44,873**	**100.0**	**44,873**	**100.0**

1993 cohort to the 2003 cohort to better evaluate any change in the industry distribution of the young workforce. Some industries employed more younger workers in 2003 than in 1993. Accommodation & Food Services and Agriculture lost the greatest percentages of workers. Accommodation & Food Services lost approximately 2,500 workers (a 21.8% decline) to other industries. (Industries with earnings higher than Accommodation & Food Services showing large numeric gains in 2003 were Mining [545 workers), Construction [673], Health Care & Social Assistance [865], and Educational Services [815].) This decline is noteworthy in light of the fact that Accommodation & Food Services is projected to be a high growth industry (see Table 5, page 79). Previous research indicates that in 2002 nonresident workers comprised over one-third of the employment in the Leisure & Hospitality industry, of which Accommodation & Food Services is a component (Wyoming Department of Employment, 2005). Consequently, meeting the employment demand in Accommodation & Food Services associated with Wyoming's youth taking advantage of work opportunities in other industries will require even greater reliance on nonresident workers.

References

Cowan, C., Hauf, D., & Leonard, D. (2005). *Wages and Benefits in Wyoming: Combining the Wyoming wage survey and the employer benefits survey for an exploration of total compensation.* Retrieved April 11, 2005, from http://doe.state.wy.us/LMI/OESBenPub.pdf

Wyoming Department of Employment, Research & Planning. (2005). *Private sector employee access to health insurance and the potential Wyo-Care market*. Casper, WY: Author.

Table 4: Workers of Age 18-24 in Wyoming's Labor Market in 2003 by Industry and Gender

	Women		Men		Total	
Industry	**N**	**%**	**N**	**%**	**N**	**%**
Agriculture	107	0.5	359	1.6	466	1.0
Mining	259	1.2	2,080	9.1	2,339	5.3
Utilities	27	0.1	88	0.4	115	0.3
Construction	480	2.2	4,125	18.0	4,605	10.3
Manufacturing	439	2.0	1,098	4.8	1,537	3.5
Wholesale Trade	237	1.1	745	3.3	982	2.2
Retail Trade	4,357	20.1	3,564	15.6	7,921	17.8
Transportation & Warehousing	214	1.0	548	2.4	762	1.7
Information	381	1.8	390	1.7	771	1.7
Finance & Insurance	688	3.2	135	0.6	823	1.8
Real Estate & Rental & Leasing	346	1.6	344	1.5	690	1.5
Professional & Technical Services	646	3.0	443	1.9	1,089	2.4
Management of Companies & Enterprises	3	0.0	3	0.0	6	0.0
Administrative & Support Services	1,067	4.9	1,268	5.5	2,335	5.2
Educational Services	1,591	7.3	1,069	4.7	2,660	6.0
Heath Care and Social Assistance	3,143	14.5	645	2.8	3,788	8.5
Arts, Entertainment, & Recreation	273	1.3	325	1.4	598	1.3
Accommodation & Food Services	5,506	25.4	3,539	15.5	9,045	20.3
Other Services	658	3.0	771	3.4	1,429	3.2
Public Administration	1,190	5.5	1,203	5.3	2,393	5.4
Unclassified	56	0.3	130	0.6	186	0.4
Total	**21,668**	**100.0**	**22,872**	**100.0**	**44,540**	**100.0**

Table 5: Workers of Age 18-24 in Wyoming's Labor Market in 1993 and 2003 by Industry

	1993		2003		Change	
Industry	**N**	**%**	**N**	**%**	**N**	**%**
Agriculture	594	1.3	466	1.0	-128	-21.5
Mining	1,794	4.0	2,339	5.3	545	30.4
Utilities	77	0.2	115	0.3	38	49.4
Construction	3,932	8.8	4,605	10.3	673	17.1
Manufacturing	1,738	3.9	1,537	3.5	-201	-11.6
Wholesale Trade	842	1.9	982	2.2	140	16.6
Retail Trade	8,890	19.8	7,921	17.8	-969	-10.9
Transportation & Warehousing	679	1.5	762	1.7	83	12.2
Information	655	1.5	771	1.7	116	17.7
Finance & Insurance	692	1.5	823	1.8	131	18.9
Real Estate & Rental & Leasing	696	1.6	690	1.5	-6	-0.9
Professional & Technical Services	856	1.9	1,089	2.4	233	27.2
Management of Companies & Enterprises	3	0.0	6	0.0	3	100.0
Administrative & Support Services	2,124	4.7	2,335	5.2	211	9.9
Educational Services	1,845	4.1	2,660	6.0	815	44.2
Heath Care & Social Assistance	2,923	6.5	3,788	8.5	865	29.6
Arts, Entertainment, & Recreation	742	1.7	598	1.3	-144	-19.4
Accommodation & Food Services	11,572	25.8	9,045	20.3	-2,527	-21.8
Other Services	1,466	3.3	1,429	3.2	-37	-2.5
Public Administration	2,328	5.2	2,393	5.4	65	2.8
Unclassified	425	0.9	186	0.4	-239	-56.2
Total	**44,873**	**100.0**	**44,540**	**100.0**	**-333**	**-0.7**