

## Occupational employment: wide variations in growth

*The economy is expected to continue generating jobs for workers at all levels of education and training; service workers are projected to be the largest group, while professional specialty is expected to be the most rapidly growing group*

George T. Silvestri

Total employment is projected to increase from 121.1 million in 1992 to 147.5 million in 2005 according to the moderate alternative projection of the Bureau of Labor Statistics. The projected 22-percent rate of employment growth is slightly higher than the increase attained during the previous 13-year period, from 1979 to 1992. By contrast, employment growth was much faster during the 1966–79 period when the baby-boomers were entering the labor force.

Projected growth from 1992 to 2005 will vary widely among the individual occupations, ranging from an increase of 138 percent to a decline of 75 percent.<sup>1</sup> In general, occupations that require a bachelor's degree or other post-secondary education or training are projected to have faster-than-average rates of employment growth. Also, many occupations requiring less formal education or training also are projected to have above average growth. In addition to the growth rate, the size of the occupational stock of jobs is an important factor in determining the numerical growth in the occupation; therefore, it has a great effect on the structure of future employment. Many slower growing occupations, some requiring little education and training and others having significant educational requirements, are expected to add significant numbers of jobs primarily because of their

large employment bases. As a result, the economy is projected to continue to generate jobs for workers at all levels of education and training.

Most of the employment growth will occur in service-producing industries. As a consequence, occupations concentrated in those industries are more likely to experience rapid employment growth, compared with occupations in the goods-producing industries. Of the 26.4 million projected increase in total employment over the 1992–2005 period, more than 25 million jobs are projected in the service-producing industries and fewer than 1 million jobs are expected in the goods-producing industries.

This article discusses projected changes in the structure of occupational employment over the 1992–2005 period. It includes analyses of the impact of various factors on occupational employment, particularly industry employment trends and expected changes in the occupational structure of industries. Data are presented to show how much each factor contributes to the overall projected employment change for each major occupational group. The article also discusses the total number of job openings that are expected to occur during the 1992–2005 period because of growth in the economy and the need to replace workers who leave the labor force or transfer to other occupa-

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tions. Finally, the article discusses the effect of projected employment restructuring on average educational requirements and on average earnings, by occupation. Of the three sets of occupational projections developed by BLS, this article focuses on the moderate alternative which is tied to the moderate economic and industry employment projections alternative presented in the articles by Norman Saunders pages 11–30, and James C. Franklin pages 41–57. The major occupational differences among the three alternatives are discussed at the end of the article.

### Major occupational groups

Among the major occupational groups, employment in professional specialty occupations, technicians and related support occupations, and service occupations is projected to increase fastest. (See table 1.) Executive, administrative, and managerial occupations also are projected to have faster-than-average employment growth, and the number of jobs for marketing and salesworkers is expected to grow about as fast as total employment. Employment in all other major occupational groups is expected to increase, but at a slower rate than total employment growth.

Although total employment is expected to grow at a rate very similar to that of the previous 1979–92 period, several of the major occupational groups are expected to depart from their historical growth rates. For example, factors that caused a decline in employment for agricultural, forestry, fishing, and related workers and for operators, fabricators, and laborers over the 1979–92 period are expected to be mitigated. Consequently, employment for these occupations are expected to in-

crease slowly rather than continue to decline. The decline in manufacturing employment from its peak in 1979 is projected to be slower through 2005 and, therefore, employment for operators, fabricators, and laborers, which is concentrated in manufacturing, is not expected to decline as it did over the 1979–92 period, despite the continuing effect of technological change on these occupations. Also, the selection of 1979, a year of high manufacturing employment, and 1992, a year when the economy had not recovered from the 1990–91 recession, gives a somewhat false impression of the trend in manufacturing employment (as is discussed in detail in the article by James Franklin).

As a result of the differences in growth rates among the major occupational groups, the structure of employment will change during the 1992–2005 period. Four groups are expected to change their employment shares by more than 1 percentage point: professional specialty occupations, +1.8; service occupations, +1.5; administrative support occupations, including clerical, –1.3; and operators, fabricators, and laborers, –1.4. As a result of these changes, service workers are projected to move from second to first place as the largest employment group in 2005, followed by administrative support workers. The most rapidly growing group, professional specialty workers, is expected to remain the third largest occupational group as it was in 1992. (The effects of these changes on the overall occupational structure of employment, on average educational attainment, and on average earnings is discussed later in this article.)

The number of executive, administrative, and managerial workers is projected to increase 3.1

Table 1. **Employment by major occupational group, 1992 and projected 2005, moderate alternative projection, and percent change 1979–92 and 1992–2005**

[Number in thousands]

Occupation	1992		2005		Percent change	
	Number	Percent	Number	Percent	1979–92	1992–2005
Total, all occupations	121,099	100.0	147,482	100.0	19.0	21.8
Executives, administrative, and managerial	12,066	10.0	15,195	10.3	50.4	25.9
Professional specialty	16,592	13.7	22,801	15.5	43.0	37.4
Technicians and related support	4,282	3.5	5,664	3.8	57.6	32.2
Marketing and sales	12,993	10.7	15,664	10.6	30.7	20.6
Administrative support, including clerical	22,349	18.5	25,406	17.2	15.0	13.7
Service	19,358	16.0	25,820	17.5	24.6	33.4
Agricultural, forestry, fishing, and related occupations	3,530	2.9	3,650	2.5	–5.2	3.4
Precision production, craft, and repair	13,580	11.2	15,380	10.4	4.3	13.3
Operators, fabricators, and laborers	16,349	13.5	17,902	12.1	–10.3	9.5

NOTE: The 1992 and 2005 employment data and the projected change 1992–2005 are derived from the industry-occupation employment matrices for each year. The data on 1979–92 percent change were derived from the Current Population Survey (CPS) because a comparable industry-occupation matrix for 1979 is not available. The CPS data represent estimates of employed

persons and exclude the estimates of persons with more than one job that are included in the industry-occupation employment matrices. The CPS exclusions of dual jobholders affects the employment levels and trends of some occupational groups more than others. Therefore, the resulting comparisons of change between 1979–92 and 1992–2005 are only broadly indicative of trends.

## *Occupational Employment*

million from 1992 to 2005, or 26 percent. This rate of growth is considerably slower than it was over the 1979–92 period when the occupational group grew by about 50 percent. While managers had the second fastest growth rate in the earlier period, they are expected to have only the fourth fastest growth rate by 2005. Part of the reason for the expected slowdown is the trend toward job restructuring. One way that firms have accomplished this goal is by giving lower-level employees a say in the management process and, consequently, reducing the employment of middle managers. Although employment in many different fields may be affected by job restructuring, the use of middle managers in the future is expected to be reduced to a greater extent, compared with many other occupations. This is especially true in manufacturing where employment in some detailed managerial occupations is projected to decline by as much as 18 percent from 1992 to 2005. In industries outside of manufacturing, the overall occupational category, executive, administrative, and managerial workers is expected to grow substantially. The services industry division is expected to account for nearly half of the total growth in jobs for managers, with very large gains registered in engineering and management services and in business services.<sup>2</sup> Other industries with significant projected employment increases for managers are wholesale and retail trade and finance, insurance, and real estate. It is also significant that self-employed executive, administrative, and managerial workers are projected to increase by 37 percent and account for about a sixth (521,000) of the 3.1 million growth in the occupational group.

Employment in professional specialty occupations is projected to grow by 6.2 million—the second largest increase after service occupations. In addition, this 37-percent rate of growth is the fastest among the major occupational groups. The share of total employment represented by professional workers is projected to increase from 13.7 to 15.5 percent. The number of workers in this occupational category also grew faster than the average for all employees during the previous 1979–92 period. The employment of professional employees is expected to increase in all major industrial sectors in the economy. Even in manufacturing, which is projected to decline by 518,000 workers by 2005, employment of professional workers is expected to increase by 230,000 jobs; mainly for computer systems analysts, engineers, and scientists. Despite the widespread growth of the professional specialty occupations, most of the increase in employment for these workers is expected in the services industry division, led by educational ser-

vices (1.7 million jobs) and health services (1.3 million jobs). Other industries that are expected to contribute significantly to the growth of professional workers are social services; business services; and engineering and management services; as well as Federal, State, and local government.

Employment of technicians and related support workers is projected to grow by 1.4 million, or by 32 percent. In the previous 1979–92 period, technicians experienced the fastest rate of growth of any major occupational group. Of the total increase in jobs for technicians by 2005, nearly 8 out of 10 are expected in the services industries. Within services, about half of the jobs for technicians (615,000) are expected in the large and rapidly growing health services industry. Other industries that are also expected to have large growth in the number of technicians by 2005 are engineering and management services and business services.

Employment in marketing and sales occupations is projected to increase by 2.7 million workers from 1992 to 2005. The projected rate of growth of 21 percent is about the same as for the economy as a whole, but it is slower than the growth over the 1979–92 period, during which employment in the marketing and sales occupational category grew faster than average. Part of the reason for this change from the earlier period is a slower projected rate of growth in total employment for wholesale and retail trade which employs the majority of marketing employees and salesworkers. This slowing of employment growth in wholesale trade is based partly on the expectation that manufacturers will increasingly distribute their products directly to retailers as they take advantage of reductions in the cost of shipping goods, particularly small loads, as well as the increased use of computerized inventory and warehouse management systems. Employment growth of marketing and salesworkers also is expected in the services industry division and in finance, insurance, and real estate.

The number of workers in administrative support occupations, including clerical, is projected to grow by 14 percent, slower than the average for all occupations. However, because of the large number of such workers, this group will increase by 3.1 million, the third largest numerical increase after service workers and professionals. However, the share of total employment represented by administrative support occupations is expected to decline from 18.5 percent to 17.2 percent. A wide range of employment increases and decreases is expected among the detailed occupations in this group—from an increase of 57 percent to a decline of 60 percent. Many occupations are expected to be affected by continued technological change and further developments in office automation. Among those

Text continues on page 73.

Table 2. **Civilian employment by occupation, actual 1992 and projected to 2005, under low, medium, and high scenarios for economic growth**

[Numbers in thousands]

Occupation	Total employment				1992-2005 employment change					
	1992	Projected, 2005			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Total, all occupations	121,099	139,007	147,482	154,430	17,908	26,383	33,330	15	22	28
Executive, administrative, and managerial occupations	12,066	14,331	15,195	15,977	2,265	3,129	3,911	19	26	32
Managerial and administrative occupations	8,411	9,847	10,427	10,982	1,436	2,016	2,570	17	24	31
Administrative services managers	226	241	256	267	14	30	40	6	13	18
Communication, transportation, and utilities operations managers	144	146	158	166	2	14	22	1	10	15
Construction managers	180	254	265	309	73	85	128	41	47	71
Education administrators	351	412	432	448	62	81	97	18	23	28
Engineering, mathematical, and natural science managers	337	410	444	476	73	106	139	22	32	41
Financial managers	701	828	875	917	127	174	215	18	25	31
Food service and lodging managers	532	732	764	787	200	232	255	38	44	48
Funeral directors and morticians	27	31	32	32	4	5	5	16	18	20
General managers and top executives	2,871	3,050	3,251	3,418	179	380	547	6	13	19
Government chief executives and legislators	73	71	76	79	-2	2	6	-3	3	8
Industrial production managers	203	189	208	224	-13	5	22	-7	2	11
Marketing, advertising, and public relations managers	432	548	588	616	116	156	184	27	36	43
Personnel, training, and labor relations managers	193	226	241	251	34	48	59	17	25	31
Property and real estate managers	243	317	328	347	74	85	104	30	35	43
Purchasing managers	221	234	252	266	13	31	45	6	14	20
All other managers and administrators	1,676	2,158	2,258	2,378	482	582	701	29	35	42
Management support occupations	3,654	4,484	4,767	4,995	829	1,113	1,340	23	30	37
Accountants and auditors	939	1,167	1,243	1,301	228	304	362	24	32	39
Budget analysts	67	75	81	85	8	13	17	12	20	26
Claims examiners, property and casualty insurance	33	39	42	42	6	9	9	18	26	26
Construction and building inspectors	66	80	86	92	15	20	26	22	30	40
Cost estimators	163	200	211	242	37	49	79	23	30	48
Credit analysts	33	33	35	35	( <sup>1</sup> )	1	2	-1	4	5
Employment interviewers, private or public employment service	79	90	96	99	11	17	20	14	22	26
Inspectors and compliance officers, except construction	155	186	196	205	31	42	50	20	27	32
Loan officers and counselors	171	230	239	241	60	68	70	35	40	41
Management analysts	208	283	297	313	75	89	105	36	43	50
Personnel, training, and labor relations specialists	281	360	383	398	79	102	117	28	36	42
Purchasing agents, except wholesale, retail, and farm products	222	200	216	232	-22	-6	10	-10	-3	4
Tax examiners, collectors, and revenue agents	64	71	75	78	6	10	14	10	16	21
Underwriters	100	116	124	125	16	24	24	16	24	24
Wholesale and retail buyers, except farm products	180	190	204	216	10	24	36	6	13	20
All other management support workers	892	1,163	1,240	1,292	271	348	400	30	39	45
Professional specialty occupations	16,592	21,640	22,801	23,681	5,048	6,209	7,089	30	37	43
Engineers	1,354	1,529	1,660	1,809	175	306	455	13	23	34
Aeronautical and astronautical engineers	66	69	75	80	4	9	15	6	14	22
Chemical engineers	52	57	62	66	5	10	15	10	19	28
Civil engineers, including traffic engineers	173	200	214	236	27	41	63	16	24	37
Electrical and electronics engineers	370	422	459	501	52	90	131	14	24	35
Industrial engineers, except safety engineers	119	126	138	151	8	20	32	6	17	27
Mechanical engineers	227	250	273	300	23	46	73	10	20	32
Metallurgists and metallurgical, ceramic, and materials engineers	19	22	24	26	3	5	7	18	28	38
Mining engineers, including mine safety engineers	4	3	4	4	( <sup>1</sup> )	0	0	-5	3	11
Nuclear engineers	17	16	17	18	-1	0	1	-5	0	6
Petroleum engineers	14	12	14	17	-2	( <sup>1</sup> )	3	-14	-2	19
All other engineers	295	350	380	409	56	85	115	19	29	39

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Table 2. Continued—Civilian employment by occupation, actual 1992 and projected to 2005, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1992–2005 employment change					
	1992	Projected, 2005			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Architects and surveyors . . . . .	214	242	257	289	28	43	75	13	20	35
Architects, except landscape and marine . . . . .	96	114	121	136	18	25	41	19	26	43
Landscape architects . . . . .	19	23	24	26	4	5	7	21	26	37
Surveyors . . . . .	99	105	112	127	6	13	27	6	13	28
Life scientists . . . . .	182	210	222	231	28	40	49	16	22	27
Agricultural and food scientists . . . . .	29	31	33	35	3	4	6	9	14	20
Biological scientists . . . . .	78	92	97	100	14	19	23	18	25	29
Foresters and conservation scientists . . . . .	35	37	40	42	2	4	7	6	12	19
Medical scientists . . . . .	39	48	51	52	9	12	14	24	31	35
All other life scientists . . . . .	1	1	2	2	0	0	0	2	8	12
Computer, mathematical, and operations research occupations . . . . .	758	1,418	1,530	1,616	660	772	858	87	102	113
Actuaries . . . . .	15	18	19	19	3	4	5	21	29	32
Computer systems analysts, engineers, and scientists . . . . .	666	1,300	1,403	1,485	634	737	819	95	111	123
Computer engineers and scientists . . . . .	211	409	447	484	198	236	273	94	112	129
Systems analysts . . . . .	455	891	956	1,001	436	501	546	96	110	120
Statisticians . . . . .	16	17	18	18	0	2	2	3	9	13
Mathematicians and all other mathematical scientists . . . . .	16	17	18	18	0	1	2	1	8	12
Operations research analysts . . . . .	45	67	72	75	22	27	30	50	61	68
Physical scientists . . . . .	197	227	243	257	29	45	60	15	23	30
Chemists . . . . .	92	104	112	117	12	20	24	13	21	27
Geologists, geophysicists, and oceanographers . . . . .	48	55	59	65	6	11	17	13	22	35
Meteorologists . . . . .	6	7	8	8	1	1	2	17	24	30
Physicists and astronomers . . . . .	21	19	20	21	-2	-1	0	-9	-3	1
All other physical scientists . . . . .	30	42	45	47	11	14	16	37	46	54
Social scientists . . . . .	258	337	353	369	80	95	111	31	37	43
Economists . . . . .	51	61	64	67	10	13	15	19	25	30
Psychologists . . . . .	143	204	212	222	60	69	78	42	48	55
Urban and regional planners . . . . .	28	32	34	36	4	6	8	16	23	29
All other social scientists . . . . .	35	40	42	44	5	7	9	14	20	25
Social, recreational, and religious workers . . . . .	1,130	1,663	1,731	1,767	533	601	637	47	53	56
Clergy . . . . .	189	238	245	250	49	56	61	26	30	32
Directors, religious activities and education . . . . .	64	80	83	83	17	19	20	26	30	31
Human services workers . . . . .	189	429	445	451	241	256	263	128	136	139
Recreation workers . . . . .	204	270	282	290	66	78	86	32	38	42
Social workers . . . . .	484	645	676	693	161	191	208	33	40	43
Lawyers and judicial workers . . . . .	716	868	913	946	152	197	230	21	28	32
Judges, magistrates, and other judicial workers . . . . .	90	87	92	96	-3	2	6	-3	2	7
Lawyers . . . . .	626	781	821	850	155	195	224	25	31	36
Teachers, librarians, and counselors . . . . .	5,984	7,642	8,010	8,284	1,658	2,026	2,300	28	34	38
Teachers, elementary . . . . .	1,456	1,683	1,767	1,830	226	311	373	16	21	26
Teachers, preschool and kindergarten . . . . .	434	646	669	682	212	236	248	49	54	57
Teachers, special education . . . . .	358	594	625	648	236	267	290	66	74	81
Teachers, secondary school . . . . .	1,263	1,640	1,724	1,789	377	462	526	30	37	42
College and university faculty . . . . .	812	976	1,026	1,064	164	214	253	20	26	31
Other teachers and instructors . . . . .	817	1,039	1,082	1,118	222	265	301	27	32	37
Farm and home management advisors . . . . .	16	15	16	16	-1	( <sup>1</sup> )	0	-8	-3	1
Instructors and coaches, sports and physical training . . . . .	260	343	355	363	82	94	102	32	36	39
Adult and vocational education teachers . . . . .	540	681	712	739	141	172	199	26	32	37
Instructors, adult (nonvocational) education . . . . .	235	285	296	309	50	60	73	21	26	31
Teachers and instructors, vocational education and training . . . . .	305	396	416	430	91	111	125	30	36	41
All other teachers and instructors . . . . .	530	698	731	755	168	201	225	32	38	42
Librarians, archivists, curators, and related workers . . . . .	160	172	181	188	11	21	28	7	13	17
Curators, archivists, museum technicians, and restorers . . . . .	19	21	23	23	2	3	4	12	18	22
Librarians, professional . . . . .	141	150	158	164	9	17	23	6	12	17
Counselors . . . . .	154	195	204	211	40	50	56	26	32	37

Table 2. **Continued—Civilian employment by occupation, actual 1992 and projected to 2005, under low, medium, and high scenarios for economic growth**

[Numbers in thousands]

Occupation	Total employment				1992–2005 employment change					
	1992	Projected, 2005			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Health diagnosing occupations . . . . .	875	1,076	1,120	1,154	201	246	280	23	28	32
Chiropractors . . . . .	46	60	62	65	14	16	19	31	36	42
Dentists . . . . .	183	185	192	200	3	9	17	1	5	9
Optometrists . . . . .	31	34	36	37	3	5	6	11	16	19
Physicians . . . . .	556	720	751	769	164	195	213	29	35	38
Podiatrists . . . . .	15	19	20	21	5	5	6	32	37	43
Veterinarians and veterinary inspectors . . . . .	44	57	59	62	12	14	18	28	33	41
Health assessment and treating occupations . . . . .	2,436	3,319	3,482	3,537	883	1,046	1,101	36	43	45
Dietitians and nutritionists . . . . .	50	60	63	64	11	13	14	21	26	29
Pharmacists . . . . .	163	198	211	217	35	47	53	21	29	33
Physician assistants . . . . .	58	74	78	79	16	20	21	28	34	36
Registered nurses . . . . .	1,835	2,479	2,601	2,637	644	765	802	35	42	44
Therapists . . . . .	329	507	530	540	178	201	211	54	61	64
Occupational therapists . . . . .	40	61	64	65	21	24	25	53	60	62
Physical therapists . . . . .	90	163	170	173	72	79	82	80	88	91
Recreational therapists . . . . .	30	41	42	43	10	12	13	34	40	42
Respiratory therapists . . . . .	74	104	109	110	30	36	37	41	48	50
Speech–language pathologists and audiologists . . . . .	73	105	110	113	32	37	40	45	51	56
All other therapists . . . . .	23	34	36	37	11	13	14	49	56	59
Writers, artists, and entertainers . . . . .	1,606	1,914	2,012	2,104	308	406	498	19	25	31
Artists and commercial artists . . . . .	273	320	335	354	47	63	81	17	23	30
Athletes, coaches, umpires, and related workers . . . . .	36	39	41	42	3	5	6	9	13	18
Dancers and choreographers . . . . .	18	22	23	24	4	5	5	20	25	28
Designers . . . . .	302	337	359	381	35	57	79	12	19	26
Designers, except interior designers . . . . .	236	267	285	302	31	49	66	13	21	28
Interior designers . . . . .	66	70	74	79	4	8	13	6	12	20
Musicians . . . . .	236	285	294	304	49	59	69	21	25	29
Photographers and camera operators . . . . .	118	141	147	153	23	29	35	20	25	30
Camera operators, television, motion picture, video . . . . .	11	13	13	14	2	2	3	17	23	27
Photographers . . . . .	107	129	134	140	21	27	32	20	25	30
Producers, directors, actors, and entertainers . . . . .	129	190	198	205	61	69	76	47	54	59
Public relations specialists and publicity writers . . . . .	98	117	123	127	19	26	30	20	26	30
Radio and TV announcers and newscasters . . . . .	56	66	70	71	10	14	15	18	25	28
Reporters and correspondents . . . . .	58	68	73	75	10	15	18	18	26	31
Writers and editors, including technical writers . . . . .	283	328	348	367	45	66	84	16	23	30
All other professional workers . . . . .	883	1,196	1,269	1,318	313	386	435	35	44	49
Technicians and related support occupations . . . . .	4,282	5,324	5,664	5,895	1,042	1,383	1,613	24	32	38
Health technicians and technologists . . . . .	2,028	2,710	2,848	2,897	682	821	870	34	40	43
Cardiology technologists . . . . .	14	18	19	19	4	5	5	29	35	36
Clinical lab technologists and technicians . . . . .	268	323	339	343	56	71	75	21	26	28
Dental hygienists . . . . .	108	147	154	156	40	46	48	37	43	45
EEG technologists . . . . .	6	9	10	10	3	3	4	47	54	55
EKG technicians . . . . .	16	13	14	14	-3	-2	-2	-18	-14	-13
Emergency medical technicians . . . . .	114	142	155	158	28	41	44	24	36	39
Licensed practical nurses . . . . .	659	879	920	933	220	261	274	33	40	42
Medical records technicians . . . . .	76	118	123	125	42	47	49	54	61	64
Nuclear medicine technologists . . . . .	12	17	18	18	5	6	6	43	50	52
Opticians, dispensing and measuring . . . . .	63	81	86	88	18	22	25	28	36	39
Psychiatric technicians . . . . .	72	86	90	91	15	19	19	20	26	27
Radiologic technologists and technicians . . . . .	162	252	264	267	90	102	105	55	63	65
Surgical technologists . . . . .	44	59	62	63	16	19	19	36	42	44
All other health professionals and paraprofessionals . . . . .	413	564	595	612	151	181	199	36	44	48
Engineering and science technicians and technologists . . . . .	1,253	1,372	1,482	1,609	118	229	356	9	18	28
Engineering technicians . . . . .	695	761	827	899	66	132	204	10	19	29
Electrical and electronic technicians and technologists . . . . .	323	363	396	432	40	74	109	12	23	34
All other engineering technicians and technologists . . . . .	372	399	431	466	27	59	94	7	16	25
Drafters . . . . .	314	324	350	391	10	35	77	3	11	24
Science and mathematics technicians . . . . .	244	286	305	319	42	61	75	17	25	31

Table 2. Continued—Civilian employment by occupation, actual 1992 and projected to 2005, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1992–2005 employment change					
	1992	Projected, 2005			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Technicians, except health and engineering and science . . . . .	1,001	1,243	1,334	1,389	242	333	388	24	33	39
Aircraft pilots and flight engineers . . . . .	85	101	115	119	16	30	34	18	35	40
Air traffic controllers . . . . .	23	24	25	26	1	2	3	3	10	14
Broadcast technicians . . . . .	35	35	37	38	( <sup>1</sup> )	1	2	-1	4	6
Computer programmers . . . . .	555	673	723	759	118	169	204	21	30	37
Legal assistants and technicians, except clerical . . . . .	192	283	299	307	91	107	115	48	56	60
Paralegals . . . . .	95	166	176	180	72	81	85	76	86	90
Title examiners and searchers . . . . .	29	33	35	36	4	6	7	13	19	23
All other legal assistants, including law clerks . . . . .	68	83	88	91	15	20	23	23	30	34
Programmers, numerical, tool, and process control . . . . .	7	7	8	9	( <sup>1</sup> )	1	2	-3	8	21
Technical assistants, library . . . . .	71	84	89	92	13	18	21	19	25	30
All other technicians . . . . .	33	36	37	39	4	5	7	11	15	20
Marketing and sales occupations . . . . .	12,993	14,659	15,664	16,336	1,665	2,671	3,342	13	21	26
Cashiers . . . . .	2,747	3,201	3,417	3,520	453	670	773	17	24	28
Counter and rental clerks . . . . .	242	314	331	341	72	88	99	30	36	41
Insurance sales workers . . . . .	415	451	477	487	36	62	73	9	15	18
Marketing and sales worker supervisors . . . . .	2,036	2,303	2,443	2,565	267	407	529	13	20	26
Real estate agents, brokers, and appraisers . . . . .	397	446	461	490	48	63	93	12	16	23
Brokers, real estate . . . . .	69	80	83	88	11	14	19	17	20	28
Real estate appraisers . . . . .	45	60	63	66	15	17	20	33	38	45
Sales agents, real estate . . . . .	283	305	315	337	22	32	53	8	11	19
Salespersons, retail . . . . .	3,660	4,137	4,446	4,611	478	786	951	13	21	26
Securities and financial services salesworkers . . . . .	200	250	265	270	50	65	71	25	33	35
Travel agents . . . . .	115	167	191	196	52	76	81	45	66	70
All other sales and related workers . . . . .	3,181	3,390	3,634	3,855	209	452	674	7	14	21
Administrative support occupations, including clerical . . . . .	22,349	23,852	25,406	26,416	1,504	3,057	4,067	7	14	18
Adjusters, investigators, and collectors . . . . .	1,152	1,412	1,510	1,545	260	358	393	23	31	34
Adjustment clerks . . . . .	352	412	445	462	61	93	110	17	26	31
Bill and account collectors . . . . .	235	309	328	339	75	94	104	32	40	45
Insurance claims and policy processing occupations . . . . .	434	545	583	584	111	149	151	26	34	35
Insurance adjusters, examiners, and investigators . . . . .	147	205	220	220	58	72	73	39	49	49
Insurance claims clerks . . . . .	116	149	158	159	33	43	44	29	37	38
Insurance policy processing clerks . . . . .	171	191	205	205	20	34	34	12	20	20
Welfare eligibility workers and interviewers . . . . .	93	103	109	114	10	16	21	10	17	22
All other adjusters and investigators . . . . .	38	42	44	46	4	7	8	11	17	20
Communications equipment operators . . . . .	327	219	234	241	-108	-93	-86	-33	-28	-26
Telephone operators . . . . .	314	211	225	232	-103	-89	-82	-33	-28	-26
Central office operators . . . . .	48	22	24	24	-26	-24	-24	-55	-50	-49
Directory assistance operators . . . . .	27	12	13	14	-15	-14	-13	-55	-51	-49
Switchboard operators . . . . .	239	177	188	194	-62	-51	-45	-26	-21	-19
All other communications equipment operators . . . . .	13	8	9	9	-5	-4	-4	-38	-33	-32
Computer operators and peripheral equipment operators . . . . .	296	162	173	181	-134	-122	-115	-45	-41	-39
Computer operators, except peripheral equipment . . . . .	266	151	161	168	-115	-104	-97	-43	-39	-37
Peripheral EDP equipment operators . . . . .	30	11	12	12	-19	-18	-18	-63	-60	-59
Information clerks . . . . .	1,333	1,665	1,762	1,810	332	429	477	25	32	36
Hotel desk clerks . . . . .	122	167	172	178	45	50	56	37	41	46
Interviewing clerks, except personnel and social welfare . . . . .	71	90	95	96	20	24	26	28	34	36
New accounts clerks, banking . . . . .	105	110	114	115	5	10	10	5	9	10
Receptionists and information clerks . . . . .	904	1,149	1,210	1,245	245	305	341	27	34	38
Reservation and transportation ticket agents and travel clerks . . . . .	131	149	171	176	18	39	45	14	30	34
Mail clerks and messengers . . . . .	271	279	298	307	8	26	35	3	10	13
Mail clerks, except mail machine operators and postal service . . . . .	132	146	155	160	14	24	28	11	18	22
Messengers . . . . .	140	134	142	147	-6	2	7	-4	2	5

Table 2. **Continued—Civilian employment by occupation, actual 1992 and projected to 2005, under low, medium, and high scenarios for economic growth**

[Numbers in thousands]

Occupation	Total employment				1992–2005 employment change					
	1992	Projected, 2005			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Postal clerks and mail carriers .....	361	325	362	390	-36	2	29	-10	0	8
Postal mail carriers .....	297	269	300	322	-28	3	25	-9	1	8
Postal service clerks .....	64	56	63	68	-7	-1	4	-12	-2	6
Material recording, scheduling, dispatching, and distributing occupations .....	3,588	3,734	4,043	4,258	145	455	669	4	13	19
Dispatchers .....	222	249	268	282	28	46	60	13	21	27
Dispatchers, except police, fire, and ambulance .....	146	167	181	190	21	34	44	14	23	30
Dispatchers, police, fire, and ambulance ..	75	82	87	91	7	12	16	9	16	22
Meter readers, utilities .....	49	47	49	51	-3	0	2	-5	0	5
Order fillers, wholesale and retail sales .....	187	200	216	232	13	29	45	7	16	24
Procurement clerks .....	61	50	54	57	-11	-7	-4	-17	-11	-6
Production, planning, and expediting clerks ..	239	248	272	292	8	32	52	3	13	22
Stock clerks .....	1,782	1,801	1,940	2,024	19	158	242	1	9	14
Traffic, shipping, and receiving clerks .....	824	889	971	1,034	65	147	209	8	18	25
Weighers, measurers, checkers, and samplers, recordkeeping .....	46	50	54	57	4	8	11	9	17	24
All other material recording, scheduling, and distribution workers .....	178	200	219	229	22	41	51	12	23	28
Records processing occupations .....	3,621	3,604	3,834	4,009	-17	213	388	( <sup>1</sup> )	6	11
Advertising clerks .....	17	22	23	24	5	6	7	28	37	43
Brokerage clerks .....	57	65	69	70	7	12	12	13	21	22
Correspondence clerks .....	31	31	33	34	0	2	3	0	7	10
File clerks .....	257	288	305	313	31	48	56	12	19	22
Financial records processing occupations ..	2,686	2,609	2,770	2,905	-77	84	219	-3	3	8
Billing, cost, and rate clerks .....	315	332	355	368	17	39	52	5	12	17
Billing, posting, and calculating machine operators .....	93	62	66	68	-31	-28	-25	-34	-29	-27
Bookkeeping, accounting, and auditing clerks .....	2,112	2,060	2,186	2,296	-52	73	184	-2	3	9
Payroll and timekeeping clerks .....	165	154	164	173	-11	-1	8	-7	( <sup>1</sup> )	5
Library assistants and bookmobile drivers ..	114	127	135	140	13	20	26	12	18	23
Order clerks, materials, merchandise, and service .....	300	289	313	331	-11	13	31	-4	4	10
Personnel clerks, except payroll and timekeeping .....	128	150	160	167	22	32	39	17	25	30
Statement clerks .....	31	24	25	25	-7	-6	-6	-23	-20	-19
Secretaries, stenographers, and typists .....	4,228	4,241	4,488	4,665	12	259	437	0	6	10
Secretaries .....	3,324	3,508	3,710	3,860	183	386	535	6	12	16
Legal secretaries .....	280	415	439	447	135	160	168	48	57	60
Medical secretaries .....	235	326	341	345	92	106	110	39	45	47
Secretaries, except legal and medical .....	2,810	2,766	2,930	3,067	-43	120	258	-2	4	9
Stenographers .....	115	107	113	117	-8	-2	3	-7	-1	2
Typists and word processors .....	789	626	664	688	-163	-125	-101	-21	-16	-13
Other clerical and administrative support workers .....	7,172	8,211	8,702	9,011	1,039	1,530	1,839	14	21	26
Bank tellers .....	525	481	502	503	-44	-24	-22	-8	-4	-4
Clerical supervisors and managers .....	1,267	1,473	1,568	1,622	206	301	355	16	24	28
Court clerks .....	50	58	61	64	8	12	15	17	24	30
Credit authorizers, credit checkers, and loan and credit clerks .....	218	260	272	276	41	53	57	19	24	26
Credit authorizers .....	19	22	23	24	3	5	6	16	24	29
Credit checkers .....	41	45	48	50	4	7	9	10	17	22
Loan and credit clerks .....	142	172	179	180	31	37	38	22	26	27
Loan interviewers .....	17	21	22	22	4	4	5	22	26	27
Customer service representatives, utilities ..	127	141	151	156	13	24	29	11	19	23
Data entry keyers, except composing .....	432	482	515	534	50	83	101	12	19	23
Data entry keyers, composing .....	16	11	12	12	-5	-4	-4	-32	-26	-24
Duplicating, mail, and other office machine operators .....	162	172	183	189	10	21	27	6	13	17
General office clerks .....	2,688	3,143	3,342	3,489	455	654	801	17	24	30
Municipal clerks .....	22	25	26	27	2	4	5	10	17	22
Proofreaders and copy markers .....	27	26	28	29	( <sup>1</sup> )	2	3	-1	6	10
Real estate clerks .....	24	34	35	37	10	11	12	40	44	52
Statistical clerks .....	74	65	69	71	-8	-4	-2	-11	-6	-3



Table 2. Continued—Civilian employment by occupation, actual 1992 and projected to 2005, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1992–2005 employment change					
	1992	Projected, 2005			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Teacher aides and educational assistants ..	885	1,209	1,266	1,308	324	381	423	37	43	48
All other clerical and administrative support workers .....	655	631	671	694	-23	16	39	-4	2	6
Service occupations .....	19,358	24,609	25,820	26,438	5,251	6,461	7,080	27	33	37
Cleaning and building service occupations, except private household .....	3,284	3,726	3,913	4,039	442	629	755	13	19	23
Institutional cleaning supervisors .....	156	200	208	213	44	52	57	28	34	37
Janitors and cleaners, including maids and housekeeping cleaners .....	2,862	3,246	3,410	3,519	384	548	657	13	19	23
Pest controllers and assistants .....	49	48	51	53	-1	2	4	-2	5	8
All other cleaning and building service workers .....	217	232	244	254	15	27	37	7	12	17
Food preparation and service occupations .....	7,669	9,566	10,060	10,189	1,897	2,391	2,520	25	31	33
Chefs, cooks, and other kitchen workers .....	3,092	4,070	4,282	4,343	978	1,190	1,251	32	38	40
Cooks, except short order .....	1,155	1,488	1,564	1,590	333	409	435	29	35	38
Bakers, bread and pastry .....	146	202	216	222	55	69	75	38	47	51
Cooks, institution or cafeteria .....	406	449	470	479	43	64	73	11	16	18
Cooks, restaurant .....	602	837	879	889	235	276	286	39	46	48
Cooks, short order and fast food .....	714	921	971	978	207	257	264	29	36	37
Food preparation workers .....	1,223	1,661	1,748	1,775	438	524	552	36	43	45
Food and beverage service occupations .....	4,365	5,223	5,489	5,548	858	1,124	1,183	20	26	27
Bartenders .....	382	335	350	354	-47	-32	-28	-12	-8	-7
Dining room and cafeteria attendants and bar helpers .....	441	546	572	580	105	131	139	24	30	31
Food counter, fountain, and related workers .....	1,564	1,776	1,872	1,895	212	308	331	14	20	21
Hosts and hostesses, restaurant, lounge, or coffee shop .....	222	286	301	304	64	79	83	29	36	37
Waiters and waitresses .....	1,756	2,280	2,394	2,415	523	637	659	30	36	37
All other food preparation and service workers .....	212	273	289	298	61	77	86	29	36	40
Health service occupations .....	2,041	2,942	3,073	3,124	901	1,032	1,082	44	51	53
Ambulance drivers and attendants, except EMTs .....	15	16	18	18	1	3	3	6	17	19
Dental assistants .....	183	244	254	258	61	72	75	34	39	41
Medical assistants .....	181	296	308	313	115	128	132	63	71	73
Nursing aides and psychiatric aides .....	1,389	1,922	2,006	2,041	533	616	652	38	44	47
Nursing aides, orderlies, and attendants .....	1,308	1,824	1,903	1,937	515	594	628	39	45	48
Psychiatric aides .....	81	98	103	105	17	22	24	21	28	30
Occupational therapy assistants and aides .....	12	20	21	21	8	9	9	71	78	80
Pharmacy assistants .....	54	72	76	77	19	22	24	35	42	44
Physical and corrective therapy assistants and aides .....	61	113	118	119	52	57	58	85	93	95
All other health service workers .....	147	260	273	276	113	125	129	77	85	88
Personal service occupations .....	2,295	3,668	3,804	3,913	1,373	1,509	1,618	60	66	70
Amusement and recreation attendants .....	207	294	303	309	87	96	102	42	46	49
Baggage porters and bellhops .....	34	47	50	52	13	16	17	38	46	51
Barbers .....	71	67	69	73	-3	-1	3	-4	-2	4
Child care workers .....	684	1,100	1,135	1,183	415	450	499	61	66	73
Cosmetologists and related workers .....	676	893	915	947	217	240	271	32	35	40
Hairdressers, hairstylists, and cosmetologists .....	628	824	846	876	196	218	248	31	35	39
Manicurists .....	35	54	55	56	18	19	21	51	54	58
Shampooers .....	12	15	15	15	3	3	3	23	24	25
Flight attendants .....	93	121	140	144	28	47	51	30	51	55
Homemaker—home health aides .....	475	1,077	1,120	1,131	602	645	656	127	136	138
Home health aides .....	347	794	827	835	447	479	488	129	138	141
Personal and home care aides .....	127	283	293	296	156	166	168	122	130	132
Ushers, lobby attendants, and ticket takers .....	56	69	72	74	13	16	18	24	29	33
Private household workers .....	869	565	583	620	-304	-286	-249	-35	-33	-29
Child care workers, private household .....	350	220	227	242	-130	-123	-108	-37	-35	-31
Cleaners and servants, private household .....	483	316	326	347	-167	-157	-136	-35	-32	-28
Cooks, private household .....	9	7	7	8	-2	-2	-1	-21	-18	-13
Housekeepers and butlers .....	27	22	22	24	-5	-5	-3	-20	-18	-12

Table 2. Continued—Civilian employment by occupation, actual 1992 and projected to 2005, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1992–2005 employment change					
	1992	Projected, 2005			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Protective service occupations .....	2,320	2,970	3,154	3,290	649	834	970	28	36	42
Firefighting occupations .....	305	334	354	372	29	50	67	10	16	22
Fire fighters .....	229	252	267	280	23	38	51	10	17	22
Fire fighting and prevention supervisors ..	62	68	72	75	6	10	13	9	16	22
Fire inspection occupations .....	14	15	15	16	1	2	3	7	13	20
Law enforcement occupations .....	982	1,198	1,271	1,333	216	289	351	22	29	36
Correction officers .....	282	452	479	503	169	197	221	60	70	78
Police and detectives .....	700	746	792	830	46	92	130	7	13	19
Police and detective supervisors .....	97	103	109	114	6	12	17	6	13	18
Police detectives and investigators .....	70	72	76	80	1	6	9	2	8	13
Police patrol officers .....	411	441	468	491	30	57	80	7	14	19
Sheriffs and deputy sheriffs .....	84	90	95	100	6	12	16	7	14	19
Other law enforcement occupations .....	38	41	43	46	3	5	8	8	14	20
Other protective service workers .....	1,034	1,438	1,529	1,586	405	495	552	39	48	53
Detectives, except public .....	59	94	100	104	35	41	45	60	70	77
Guards .....	803	1,138	1,211	1,255	335	408	452	42	51	56
Crossing guards .....	57	65	69	72	8	12	15	14	20	27
All other protective service workers .....	115	141	149	155	26	34	40	23	30	35
All other service workers .....	879	1,172	1,232	1,263	292	353	384	33	40	44
Agriculture, forestry, fishing, and related occupations .....	3,530	3,523	3,650	3,871	-7	120	341	( <sup>1</sup> )	3	10
Animal caretakers, except farm .....	103	138	143	151	36	41	48	35	40	47
Farm occupations .....	921	806	832	881	-115	-88	-40	-12	-10	-4
Farmworkers .....	849	696	716	758	-153	-133	-91	-18	-16	-11
Nursery workers .....	72	110	116	123	38	44	51	53	62	71
Farm operators and managers .....	1,218	984	1,014	1,081	-234	-204	-137	-19	-17	-11
Farmers .....	1,088	831	857	914	-257	-231	-174	-24	-21	-16
Farm managers .....	130	153	157	167	23	27	37	18	21	28
Fishers, hunters, and trappers .....	60	62	64	67	1	3	6	2	5	10
Captains and other officers, fishing vessels ..	8	8	9	9	0	1	1	4	7	12
Fishers, hunters, and trappers .....	52	53	55	58	1	2	5	2	5	10
Forestry and logging occupations .....	131	128	134	148	-3	3	17	-2	2	13
Forest and conservation workers .....	35	41	43	47	6	8	12	16	22	33
Timber cutting and logging occupations .....	96	87	91	101	-9	-5	5	-9	-5	6
Fallers and buckers .....	33	28	29	32	-5	-4	-1	-15	-11	-3
Logging tractor operators .....	26	26	27	30	( <sup>1</sup> )	1	4	-1	4	16
Log handling equipment operators .....	15	14	15	17	-1	-1	1	-9	-4	9
All other timber cutting and related logging workers .....	22	20	20	23	-2	-1	1	-10	-7	4
Gardeners and groundskeepers, except farm ..	884	1,152	1,195	1,261	268	311	377	30	35	43
Supervisors, farming, forestry, and agricultural related occupations .....	71	80	83	89	9	12	17	13	17	24
All other agricultural, forestry, fishing, and related workers .....	142	173	184	194	31	42	62	22	29	36
Precision production, craft, and repair occupations .....	13,580	14,465	15,380	16,713	885	1,800	3,133	7	13	23
Blue-collar worker supervisors .....	1,757	1,844	1,974	2,131	87	217	374	5	12	21
Construction trades .....	3,510	4,116	4,295	4,826	606	786	1,317	17	22	38
Bricklayers and stone masons .....	139	167	174	200	29	36	62	21	26	44
Carpenters .....	978	1,131	1,176	1,317	153	198	338	16	20	35
Carpet installers .....	62	72	75	81	10	13	19	17	22	31
Ceiling tile installers and acoustical carpenters .....	12	11	12	14	-1	( <sup>1</sup> )	2	-5	-1	16
Concrete and terrazzo finishers .....	100	109	113	133	9	13	33	9	13	33
Drywall installers and finishers .....	121	159	165	190	38	44	70	32	37	58
Electricians .....	518	588	618	698	70	100	180	14	19	35
Glaziers .....	39	49	51	59	10	12	19	24	30	48
Hard tile setters .....	30	36	37	42	6	7	12	21	25	40
Highway maintenance workers .....	168	204	217	230	36	49	62	22	29	37
Insulation workers .....	57	76	79	92	19	22	36	34	40	63
Painters and paperhangers, construction and maintenance .....	440	547	569	624	107	128	184	24	29	42
Paving, surfacing, and tamping equipment operators .....	72	102	107	123	30	35	50	41	48	69

Table 2. Continued—Civilian employment by occupation, actual 1992 and projected to 2005, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1992–2005 employment change					
	1992	Projected, 2005			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Pipelayers and pipelaying fitters .....	48	58	61	70	10	13	22	21	26	45
Plasterers .....	32	36	37	43	4	5	11	12	16	34
Plumbers, pipefitters, and steamfitters .....	351	362	378	428	11	27	76	3	8	22
Roofers .....	127	149	155	176	22	28	49	17	22	38
Structural and reinforcing metal workers .....	66	78	81	95	12	15	29	18	22	44
All other construction trades workers .....	150	181	190	214	31	40	64	20	26	43
<b>Extractive and related workers, including</b>										
blasters .....	231	211	226	263	-20	-6	32	-9	-2	14
Oil and gas extraction occupations .....	69	44	48	70	-25	-21	1	-36	-31	2
Roustabouts .....	33	20	22	32	-13	-11	-1	-38	-33	-2
All other oil and gas extraction occupations .....	36	24	26	38	-12	-10	2	-33	-29	5
Mining, quarrying, and tunneling occupations .....	21	17	19	20	-4	-3	-1	-18	-12	-6
All other extraction and related workers .....	141	149	159	173	9	18	32	6	13	23
<b>Mechanics, installers, and repairers</b> .....	4,819	5,240	5,581	5,929	421	762	1,110	9	16	23
Communications equipment mechanics, installers, and repairers .....	108	62	68	69	-46	-41	-39	-43	-38	-36
Central office and PBX installers and repairers .....	70	41	45	46	-29	-25	-24	-41	-36	-34
Frame wirers, central office .....	11	2	3	3	-8	-8	-8	-77	-75	-75
Radio mechanics .....	9	8	8	9	-2	-1	-1	-17	-11	-9
Signal or track switch maintainers .....	3	1	1	1	-2	-2	-2	-77	-75	-73
All other communications equipment mechanics, installers, and repairers .....	15	10	11	11	-5	-4	-4	-34	-30	-27
Electrical and electronic equipment mechanics, installers, and repairers .....	545	500	535	570	-45	-9	25	-8	-2	5
Data processing equipment repairers .....	83	112	120	128	29	38	45	35	45	55
Electrical powerline installers and repairers .....	108	110	117	126	3	9	18	2	9	17
Electronic home entertainment equipment repairers .....	39	35	37	38	-4	-2	( <sup>1</sup> )	-11	-5	-1
Electronics repairers, commercial and industrial equipment .....	68	68	73	78	0	5	9	0	7	14
Station installers and repairers, telephone .....	40	18	20	20	-22	-20	-19	-55	-50	-49
Telephone and cable TV line installers and repairers .....	165	117	125	134	-49	-40	-31	-29	-24	-19
All other electrical and electronic equipment mechanics, installers, and repairers .....	42	40	43	46	-2	1	3	-5	3	8
Machinery and related mechanics, installers, and repairers .....	1,696	1,889	2,005	2,122	193	310	426	11	18	25
Industrial machinery mechanics .....	477	427	462	492	-50	-15	14	-11	-3	3
Maintenance repairers, general utility .....	1,145	1,388	1,464	1,542	243	319	397	21	28	35
Millwrights .....	73	74	79	88	1	6	15	1	9	20
Vehicle and mobile equipment mechanics and repairers .....	1,524	1,735	1,850	1,964	211	326	440	14	21	29
Aircraft mechanics and engine specialists .....	131	131	148	154	( <sup>1</sup> )	17	22	( <sup>1</sup> )	13	17
Aircraft engine specialists .....	26	26	28	30	-1	2	3	-2	8	13
Aircraft mechanics .....	105	106	120	124	0	15	19	0	14	18
Automotive body and related repairers .....	202	250	263	281	48	61	80	24	30	39
Automotive mechanics .....	739	857	907	960	117	168	220	16	23	30
Bus and truck mechanics and diesel engine specialists .....	263	305	327	348	42	64	85	16	24	32
Farm equipment mechanics .....	47	49	53	56	3	6	10	6	13	21
Mobile heavy equipment mechanics .....	96	94	100	109	-2	4	13	-3	4	13
Motorcycle, boat, and small engine mechanics .....	46	50	53	56	4	7	9	8	15	21
Motorcycle repairers .....	11	10	10	11	-1	( <sup>1</sup> )	0	-10	-4	1
Small engine specialists .....	35	40	43	45	5	7	9	14	21	27
Other mechanics, installers, and repairers .....	946	1,054	1,123	1,204	108	176	258	11	19	27
Bicycle repairers .....	14	18	20	20	5	6	7	36	45	51
Camera and photographic equipment repairers .....	8	8	9	9	1	1	2	10	16	23

Table 2. Continued—Civilian employment by occupation, actual 1992 and projected to 2005, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1992–2005 employment change					
	1992	Projected, 2005			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Coin and vending machine servicers and repairers . . . . .	20	19	20	20	-1	( <sup>1</sup> )	1	-6	( <sup>1</sup> )	3
Electric meter installers and repairers . . . . .	13	12	13	13	-1	-1	( <sup>1</sup> )	-11	-6	-1
Electromedical and biomedical equipment repairers . . . . .	10	12	13	13	3	3	4	30	37	39
Elevator installers and repairers . . . . .	22	24	25	29	3	4	8	12	18	35
Heat, air conditioning, and refrigeration mechanics and installers . . . . .	212	261	274	305	49	62	94	23	29	44
Home appliance and power tool repairers . . . . .	74	69	74	77	-5	( <sup>1</sup> )	3	-6	( <sup>1</sup> )	4
Locksmiths and safe repairers . . . . .	18	21	22	23	2	3	5	12	19	25
Musical instrument repairers and tuners . . . . .	12	13	13	14	0	1	2	4	9	15
Office machine and cash register servicers . . . . .	60	60	65	70	0	5	10	0	8	16
Precision instrument repairers . . . . .	45	44	48	51	-1	3	6	-1	7	13
Riggers . . . . .	12	11	12	13	-1	0	1	-6	1	10
Tire repairers and changers . . . . .	80	89	95	99	8	15	19	10	18	24
Watchmakers . . . . .	9	7	7	8	-2	-2	-2	-26	-23	-18
All other mechanics, installers, and repairers . . . . .	338	386	413	439	48	75	100	14	22	30
Production occupations, precision . . . . .	2,956	2,737	2,965	3,205	-219	9	249	-7	0	8
Assemblers, precision . . . . .	334	281	316	356	-54	-18	22	-16	-6	7
Aircraft assemblers, precision . . . . .	26	25	27	29	-1	1	3	-4	4	12
Electrical and electronic equipment assemblers, precision . . . . .	150	113	129	147	-37	-21	-2	-24	-14	-1
Electromechanical equipment assemblers, precision . . . . .	48	37	42	47	-11	-6	-1	-24	-13	-2
Fitters, structural metal, precision . . . . .	15	14	14	17	-1	( <sup>1</sup> )	2	-7	-1	14
Machine builders and other precision machine assemblers . . . . .	57	52	59	66	-4	2	9	-8	4	17
All other precision assemblers . . . . .	40	41	45	50	1	6	10	2	14	26
Food workers, precision . . . . .	305	264	279	286	-41	-26	-19	-13	-8	-6
Bakers, manufacturing . . . . .	43	44	45	46	1	2	3	2	6	7
Butchers and meatcutters . . . . .	222	179	191	197	-42	-31	-25	-19	-14	-11
All other precision food and tobacco workers . . . . .	40	41	43	43	1	2	3	2	6	7
Inspectors, testers, and graders, precision . . . . .	625	511	559	598	-113	-65	-27	-18	-10	-4
Metal workers, precision . . . . .	854	807	880	975	-46	26	121	-5	3	14
Boilermakers . . . . .	26	24	25	28	-2	-1	2	-9	-4	6
Jewelers and silversmiths . . . . .	30	33	35	37	3	6	7	11	19	25
Machinists . . . . .	352	315	348	382	-37	-4	30	-10	-1	8
Sheet metal workers and duct installers . . . . .	208	229	244	279	21	36	71	10	17	34
Shipfitters . . . . .	13	10	11	11	-3	-2	-2	-23	-18	-16
Tool and die makers . . . . .	138	115	128	141	-22	-9	3	-16	-7	3
All other precision metal workers . . . . .	88	81	89	97	-7	1	10	-8	1	11
Printing workers, precision . . . . .	151	163	176	182	13	25	31	8	17	21
Bookbinders . . . . .	8	8	9	9	0	1	1	6	14	18
Prepress printing workers, precision . . . . .	130	133	143	147	3	13	18	2	10	13
Compositors and typesetters, precision . . . . .	11	7	8	8	-3	-3	-3	-31	-27	-23
Job printers . . . . .	15	9	10	10	-6	-5	-5	-39	-35	-33
Paste-up workers . . . . .	22	17	18	19	-5	-4	-3	-25	-19	-16
Electronic pagination systems workers . . . . .	18	29	32	33	12	14	15	65	78	84
Photoengravers . . . . .	7	7	8	8	1	1	2	12	21	25
Camera operators . . . . .	14	14	15	16	( <sup>1</sup> )	1	2	( <sup>1</sup> )	7	11
Strippers, printing . . . . .	30	35	38	39	5	8	9	16	25	29
Platemakers . . . . .	13	13	14	15	( <sup>1</sup> )	1	1	-1	7	10
All other printing workers, precision . . . . .	13	23	24	25	9	11	12	72	85	91
Textile, apparel, and furnishings workers, precision . . . . .	266	245	260	271	-21	-6	5	-8	-2	2
Custom tailors and sewers . . . . .	113	103	109	114	-9	-4	1	-8	-4	1
Patternmakers and layout workers, fabric and apparel . . . . .	18	13	15	15	-5	-3	-3	-29	-18	-17
Shoe and leather workers and repairers, precision . . . . .	22	16	17	18	-6	-4	-4	-26	-20	-17
Upholsterers . . . . .	60	63	67	71	3	7	10	5	11	17
All other precision textile, apparel, and furnishings workers . . . . .	54	50	52	53	-4	-1	( <sup>1</sup> )	-7	-2	-1

Table 2. Continued—Civilian employment by occupation, actual 1992 and projected to 2005, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1992–2005 employment change					
	1992	Projected, 2005			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Woodworkers, precision .....	220	258	272	305	37	52	85	17	24	38
Cabinetmakers and bench carpenters .....	114	135	141	160	21	28	47	19	24	41
Furniture finishers .....	37	40	43	46	4	7	9	11	18	25
Wood machinists .....	46	56	60	67	10	13	21	22	29	45
All other precision woodworkers .....	24	26	28	32	2	4	8	10	18	33
Other precision workers .....	201	207	222	233	6	21	32	3	10	16
Dental lab technicians, precision .....	48	48	50	51	( <sup>1</sup> )	2	2	-1	3	5
Optical goods workers, precision .....	19	20	23	24	2	4	5	9	22	25
Photographic process workers, precision .....	14	17	18	18	3	4	4	21	26	31
All other precision workers .....	120	122	132	140	2	12	20	2	10	17
Plant and system occupations .....	308	317	340	359	9	32	51	3	10	17
Chemical plant and system operators .....	39	36	40	41	-3	0	2	-7	1	5
Electric power generating plant operators, distributors, and dispatchers .....	43	44	47	49	2	4	6	4	10	15
Power distributors and dispatchers .....	17	16	17	17	-1	0	1	-6	0	5
Power generating and reactor plant operators .....	26	29	30	32	3	4	5	10	16	21
Gas and petroleum plant and system occupations .....	31	27	30	33	-5	-2	2	-15	-5	7
Stationary engineers .....	31	31	33	34	( <sup>1</sup> )	2	3	-1	5	9
Water and liquid waste treatment plant and system operators .....	86	96	102	107	10	16	21	11	18	24
All other plant and system operators .....	78	83	89	95	6	12	17	7	15	22
Operators, fabricators, and laborers .....	16,349	16,603	17,902	19,103	254	1,553	2,754	2	10	17
Machine setters, set-up operators, operators, and tenders .....	4,676	3,958	4,326	4,579	-719	-350	-97	-15	-7	-2
Numerical control machine tool operators and tenders, metal and plastic .....	73	78	87	97	5	14	24	7	20	33
Combination machine tool setters, set-up operators, operators, and tenders .....	102	114	126	138	12	24	37	12	24	36
Machine tool cut and form setters, operators, and tenders, metal and plastic .....	674	530	586	643	-144	-89	-31	-21	-13	-5
Drilling and boring machine tool setters and set-up operators, metal and plastic .....	44	34	38	43	-9	-5	-1	-21	-12	-2
Grinding machine setters and set-up operators, metal and plastic .....	65	53	58	64	-13	-7	-1	-20	-11	-2
Lathe and turning machine tool setters and set-up operators, metal and plastic .....	69	52	58	64	-17	-11	-4	-24	-16	-6
Machine forming operators and tenders, metal and plastic .....	155	112	123	133	-43	-32	-22	-28	-21	-14
Machine tool cutting operators and tenders, metal and plastic .....	114	85	95	104	-29	-19	-9	-25	-17	-8
Punching machine setters and set-up operators, metal and plastic .....	45	34	38	41	-11	-7	-4	-25	-17	-8
All other machine tool cutting and forming, etc. ....	182	160	176	193	-23	-7	11	-12	-4	6
Metal fabricating machine setters, operators, and related workers .....	151	123	134	150	-29	-17	-1	-19	-11	-1
Metal fabricators, structural metal products .....	45	42	45	52	-3	0	7	-6	0	15
Soldering and brazing machine operators and tenders .....	9	7	8	9	-2	-1	0	-21	-10	2
Welding machine setters, operators, and tenders .....	97	73	80	89	-24	-17	-8	-25	-17	-8
Metal and plastic processing machine setters, operators, and related workers .....	399	365	401	435	-34	3	36	-8	1	9
Electrolytic plating machine operators and tenders, setters and set-up operators, metal and plastic .....	42	37	41	46	-5	-1	4	-12	-2	10
Foundry mold assembly and shakeout workers .....	9	8	9	10	-1	0	1	-6	3	14
Furnace operators and tenders .....	20	17	19	20	-3	-1	1	-16	-6	3
Heaters, metal and plastic .....	3	3	3	4	( <sup>1</sup> )	( <sup>1</sup> )	0	-13	-4	4
Heating equipment setters and set-up operators, metal and plastic .....	6	5	5	6	-1	-1	( <sup>1</sup> )	-22	-13	-5

Table 2. Continued—Civilian employment by occupation, actual 1992 and projected to 2005, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1992–2005 employment change					
	1992	Projected, 2005			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Heat treating machine operators and tenders, metal and plastic .....	19	15	16	18	-4	-3	-1	-22	-14	-5
Metal molding machine operators and tenders, setters and set-up operators .....	38	31	34	37	-8	-4	-1	-20	-11	-2
Nonelectrolytic plating machine operators and tenders, setters and set-up operators, metal and plastic .....	7	6	7	7	-1	-1	0	-18	-9	1
Plastic molding machine operators and tenders, setters and set-up operators .....	150	148	161	171	-3	11	21	-2	7	14
All other metal and plastic machine setters, operators, and related workers .....	104	96	106	115	-7	2	11	-7	2	11
Printing, binding, and related workers .....	375	411	444	459	36	69	85	10	18	23
Bindery machine operators and set-up operators .....	68	73	79	81	5	11	13	8	16	20
Prepress printing workers, production .....	24	21	22	23	-4	-2	-1	-15	-9	-5
Photoengraving and lithographic machine operators and tenders .....	5	5	5	5	0	0	1	3	11	14
Typesetting and composing machine operators and tenders .....	20	16	17	18	-4	-3	-2	-19	-13	-10
Printing press operators .....	217	237	255	264	20	38	47	9	18	22
Letterpress operators .....	13	10	11	12	-3	-2	-2	-21	-15	-12
Offset lithographic press operators .....	79	101	108	112	22	29	33	28	37	42
Printing press machine setters, operators and tenders .....	110	109	118	122	-1	8	12	( <sup>1</sup> )	7	11
All other printing press setters and set-up operators .....	14	16	17	18	2	3	4	12	19	24
Screen printing machine setters and set-up operators .....	25	31	34	35	6	9	10	23	37	42
All other printing, binding, and related workers .....	41	49	54	56	8	12	15	20	30	36
Textile and related setters, operators, and related workers .....	1,041	733	829	843	-308	-212	-198	-30	-20	-19
Extruding and forming machine operators and tenders, synthetic or glass fibers .....	23	19	21	22	-4	-2	-1	-17	-10	-5
Pressing machine operators and tenders, textile, garment, and related materials .....	78	80	86	86	2	8	8	3	10	11
Sewing machine operators, garment .....	556	338	393	396	-217	-162	-159	-39	-29	-29
Sewing machine operators, non-garment .....	124	103	114	118	-21	-10	-6	-17	-8	-5
Textile bleaching and dyeing machine operators and tenders .....	29	23	26	27	-6	-3	-3	-21	-11	-9
Textile draw-out and winding machine operators and tenders .....	192	140	157	161	-52	-35	-32	-27	-18	-16
Textile machine setters and set-up operators .....	39	29	32	33	-10	-7	-6	-26	-17	-15
Woodworking machine setters, operators, and other related workers .....	121	92	96	110	-28	-24	-10	-24	-20	-9
Head sawyers and sawing machine operators and tenders, setters and set-up operators .....	59	44	46	53	-15	-13	-6	-26	-22	-10
Woodworking machine operators and tenders, setters and set-up operators .....	62	48	51	57	-13	-11	-4	-22	-18	-7
Other machine setters, set-up operators, operators, and tenders .....	1,741	1,512	1,622	1,702	-229	-119	-39	-13	-7	-2
Boiler operators and tenders, low pressure .....	18	15	16	17	-2	-1	-1	-14	-8	-3
Cement and gluing machine operators and tenders .....	35	26	28	30	-9	-7	-4	-26	-20	-13
Chemical equipment controllers, operators and tenders .....	77	70	76	80	-7	-1	2	-10	-2	3
Cooking and roasting machine operators and tenders, food and tobacco .....	28	31	32	33	3	4	4	10	13	15
Crushing and mixing machine operators and tenders .....	133	109	117	124	-24	-16	-9	-18	-12	-7
Cutting and slicing machine setters, operators and tenders .....	94	68	73	76	-26	-21	-18	-28	-23	-19

## Occupational Employment

Table 2. Continued—Civilian employment by occupation, actual 1992 and projected to 2005, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment			1992–2005 employment change						
	1992	Projected, 2005			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Dairy processing equipment operators, including setters	15	16	17	17	1	1	2	4	9	10
Electronic semiconductor processors	32	28	33	39	-4	1	7	-12	4	22
Extruding and forming machine setters, operators and tenders	99	93	101	106	-6	2	7	-6	2	7
Furnace, kiln, or kettle operators and tenders	27	24	25	28	-3	-2	1	-13	-6	3
Laundry and drycleaning machine operators and tenders, except pressing	162	228	237	241	66	75	79	41	46	49
Motion picture projectionists	9	7	7	7	-3	-2	-2	-29	-26	-24
Packaging and filling machine operators and tenders	319	232	248	257	-86	-71	-62	-27	-22	-19
Painting and coating machine operators	151	140	152	166	-10	2	15	-7	1	10
Coating, painting, and spraying machine operators, tenders, setters, and set-up operators	107	98	107	117	-9	0	11	-8	0	10
Painters, transportation equipment	44	43	45	48	-1	1	4	-3	3	10
Paper goods machine setters and set-up operators	50	59	64	66	8	13	16	17	26	31
Photographic processing machine operators and tenders	49	55	59	60	6	9	11	12	19	23
Separating and still machine operators and tenders	21	13	14	15	-8	-7	-6	-37	-33	-30
Shoe sewing machine operators and tenders	16	9	10	10	-7	-6	-6	-46	-38	-36
Tire building machine operators	14	10	11	12	-4	-3	-3	-29	-22	-19
All other machine operators, tenders, setters, and set-up operators	390	279	302	319	-111	-88	-71	-28	-23	-18
Hand workers, including assemblers and fabricators	2,528	2,422	2,630	2,833	-106	102	305	-4	4	12
Cannery workers	73	80	82	83	7	10	10	10	13	14
Coil winders, tapers, and finishers	20	12	14	16	-8	-7	-4	-41	-32	-22
Cutters and trimmers, hand	49	40	44	46	-10	-5	-3	-19	-10	-7
Electrical and electronic assemblers	210	164	187	213	-47	-23	3	-22	-11	1
Grinders and polishers, hand	71	66	72	80	-5	1	8	-8	2	12
Machine assemblers	49	44	49	54	-5	( <sup>1</sup> )	5	-11	-1	10
Meat, poultry, and fish cutters and trimmers, hand	127	163	169	171	35	42	43	28	33	34
Metal pourers and casters, basic shapes	10	8	9	10	-2	-1	0	-16	-7	2
Painting, coating, and decorating workers, hand	29	35	37	40	6	8	11	19	28	37
Portable machine cutters	11	5	6	6	-5	-4	-4	-48	-40	-39
Pressers, hand	16	13	15	15	-3	-1	-1	-17	-7	-6
Sewers, hand	23	20	22	22	-3	-1	( <sup>1</sup> )	-14	-5	-1
Solderers and brazers	21	20	23	25	-1	2	4	-3	8	18
Welders and cutters	306	326	352	388	21	46	82	7	15	27
All other assemblers and fabricators	1,113	921	1,007	1,096	-192	-107	-18	-17	-10	-2
All other hand workers	400	505	542	568	105	142	169	26	36	42
Transportation and material moving machine and vehicle operators	4,694	5,336	5,719	6,087	642	1,025	1,393	14	22	30
Motor vehicle operators	3,429	4,001	4,285	4,524	572	856	1,095	17	25	32
Bus drivers	562	633	681	701	71	119	139	13	21	25
Bus drivers	167	163	177	182	-5	10	15	-3	6	9
Bus drivers, school	395	471	504	519	76	109	124	19	28	31
Taxi drivers and chauffeurs	120	133	142	148	13	22	28	11	18	23
Truck drivers	2,720	3,202	3,428	3,639	482	708	919	18	26	34
Driver/salesworkers	329	366	389	404	37	60	74	11	18	22
Truck drivers light and heavy	2,391	2,836	3,039	3,235	446	648	845	19	27	35
All other motor vehicle operators	27	33	34	36	5	7	9	20	27	33
Rail transportation workers	116	131	141	150	14	25	34	12	21	29
Locomotive engineers	19	19	21	22	( <sup>1</sup> )	2	3	( <sup>1</sup> )	8	16
Railroad brake, signal, and switch operators	35	35	38	40	( <sup>1</sup> )	3	5	-1	8	15
Railroad conductors and yardmasters	29	34	37	40	5	8	11	18	28	37

Table 2. Continued—Civilian employment by occupation, actual 1992 and projected to 2005, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment			1992-2005 employment change						
	1992	Projected, 2005			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Rail yard engineers, dinkey operators, and hostlers . . . . .	9	9	9	10	( <sup>1</sup> )	1	1	-2	6	14
Subway and streetcar operators . . . . .	22	33	35	37	11	13	15	48	57	65
All other rail vehicle operators . . . . .	2	1	1	1	-1	-1	-1	-55	-52	-48
Water transportation and related workers . . . . .	134	130	144	155	-4	10	21	-3	8	16
Able seamen, ordinary seamen, and marine oilers . . . . .	22	18	21	23	-4	-1	1	-18	-5	5
Captains and pilots, ship . . . . .	16	14	16	18	-2	( <sup>1</sup> )	2	-13	( <sup>1</sup> )	10
Mates, ship, boat, and barge . . . . .	7	6	7	7	-1	( <sup>1</sup> )	0	-20	-7	3
Ship engineers . . . . .	9	7	8	9	-2	-1	( <sup>1</sup> )	-20	-9	( <sup>1</sup> )
All other transportation and related workers . . . . .	79	85	92	98	5	13	18	7	16	23
Material moving equipment operators . . . . .	983	1,039	1,111	1,218	56	129	235	6	13	24
Crane and tower operators . . . . .	46	49	53	59	3	7	13	7	16	29
Excavation and loading machine operators . . . . .	72	83	86	100	11	14	28	15	20	38
Grader, dozer, and scraper operators . . . . .	102	118	123	142	15	21	39	15	20	38
Hoist and winch operators . . . . .	12	12	13	14	( <sup>1</sup> )	1	2	-1	6	20
Industrial truck and tractor operators . . . . .	413	410	442	471	-3	29	58	-1	7	14
Operating engineers . . . . .	136	152	159	179	16	23	43	12	17	32
All other material moving equipment operators . . . . .	201	216	234	254	14	33	52	7	16	26
All other transportation and material moving equipment operators . . . . .	32	35	38	41	3	5	8	9	16	25
Helpers, laborers, and material movers, hand . . . . .	4,451	4,887	5,227	5,604	436	776	1,153	10	17	26
Freight, stock, and material movers, hand . . . . .	845	885	955	1,011	41	111	166	5	13	20
Hand packers and packagers . . . . .	685	715	770	804	30	85	119	4	12	17
Helpers, construction trades . . . . .	452	509	530	624	57	79	172	13	17	38
Machine feeders and offbearers . . . . .	255	239	256	274	-16	2	19	-6	1	7
Parking lot attendants . . . . .	63	81	85	90	19	22	27	30	35	44
Refuse collectors . . . . .	121	126	134	141	4	13	19	4	11	16
Service station attendants . . . . .	190	168	180	189	-22	-10	-1	-12	-5	-1
Vehicle washers and equipment cleaners . . . . .	219	255	271	288	36	52	69	16	24	31
All other helpers, laborers, and material movers, hand . . . . .	1,621	1,908	2,044	2,183	287	423	562	18	26	35

<sup>1</sup> A decline of fewer than 1,000 workers.

that are projected to decline are telephone operators; typists and word processors; and postal service clerks. Occupations that involve a great deal of contact with people, and therefore are not affected significantly by expected changes in technology, are projected to have average or higher-than-average rates of growth. Among these occupations are hotel desk clerks; receptionists and information clerks; and teacher aides and educational assistants. About 80 percent of the job growth for administrative support occupations is expected in the service industry division, led by business services (643,000 jobs); health services (550,000 jobs); and educational services (519,000 jobs). Significant growth of about 401,000 jobs also is expected in wholesale and retail trade and 390,000 jobs are expected in finance, insurance, and real estate. A combined decrease of more than 248,000 jobs is

estimated for manufacturing, communications and utilities, and for government.

Employment in service occupations is projected to increase by 6.5 million jobs—the largest gain for a major occupational group. While this group grew faster than the average for all occupations in the 1979-92 period, the 33-percent projected growth rate through 2005 is significantly higher than the earlier rate of growth. Overall, service occupations are expected to increase as a share of total employment from 16.0 percent to 17.5 percent. More than half of the jobs projected for this group are in the very rapidly growing services industry division, led by health services (1.4 million jobs); social services (682,000 jobs); and business services (658,000 jobs). In addition, retail trade, with large numbers of food preparation and service workers, is projected to add another 2 million jobs for service occupations, and State and



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local governments, with substantial numbers of law enforcement occupations, are projected to contribute a combined total of 404,000 more service worker jobs.

Agriculture, forestry, fishing, and related occupations are projected to increase by just 120,000, the smallest increase for any major occupational group. The 3 percent projected rate of growth, however, reverses the decline in employment of about 5 percent that occurred between 1979 and 1992. Nevertheless, the proportion of workers in this group are expected to fall from a 2.9-percent share of total employment in 1992 to 2.5 percent by 2005. Within this major group, jobs for farmers are expected to decline by 231,000. Offsetting this loss is the projected increase of 311,000 jobs for gardeners and groundskeepers, except farm, who are largely employed in the rapidly growing segment of agricultural services that provides gardening and lawn services.

Employment in precision production, craft, and repair occupations is projected to increase by 1.8 million jobs and grow at a rate of 13 percent from 1992 to 2005. The group's share of total employment, however, is still projected to decline from 11.2 percent to 10.4 percent. During the previous 1979-92 period, employment for this group of workers grew by just 4 percent. Most of the job

growth within the major occupational group is expected among construction trades workers and mechanics, installers, and repairers. From an industry perspective, the services division is expected to provide 666,000 of the total increase in projected jobs; construction—686,000 jobs; and wholesale trade—131,000 jobs. Clearly, some of the increases in construction represent jobs lost in the recent recession. Significant job declines are expected in manufacturing (-156,000); communications and utilities (-84,000); and mining (-33,000).

The number of operators, fabricators, and laborers is expected to increase by 1.6 million workers, or by 10 percent, from 1992 to 2005. In the previous 13-year period, this group of workers declined by 10 percent. Part of the reason for the expected reversal in trend is that 1979 was a peak year for total manufacturing employment, and from that year to 1992, when the 1990-91 recession effect was still present, nearly 3 million manufacturing jobs were lost. In contrast, total manufacturing employment is projected to decline by 518,000 through 2005. The projected decline of 454,000 jobs for operators, fabricators, and laborers in manufacturing is expected to be more than offset by the gains in services (889,000 jobs); transportation (389,000 jobs); wholesale and retail

Table 3. **Fastest growing occupations, 1992-2005, moderate alternative projection**

[Numbers in thousands]

Occupation	Employment		Numerical change	Percent change
	1992	2005		
Home health aides .....	347	827	479	138
Human services workers .....	189	445	256	136
Personal and home care aides .....	127	293	166	130
Computer engineers and scientists .....	211	447	236	112
Systems analysts .....	455	956	501	110
Physical and corrective therapy assistants and aides .....	61	118	57	93
Physical therapists .....	90	170	79	88
Paralegals .....	95	176	81	86
Teachers, special education .....	358	625	267	74
Medical assistants .....	181	308	128	71
Detectives, except public .....	59	100	41	70
Correction officers .....	282	479	197	70
Child care workers .....	684	1,135	450	66
Travel agents .....	115	191	76	66
Radiologic technologists and technicians .....	162	264	102	63
Nursery workers .....	72	116	44	62
Medical records technicians .....	76	123	47	61
Operations research analysts .....	45	72	27	61
Occupational therapists .....	40	64	24	60
Legal secretaries .....	280	439	160	57
Teachers, preschool and kindergarten .....	434	669	236	54
Manicurists .....	35	55	19	54
Producers, directors, actors, and entertainers .....	129	198	69	54
Speech-language pathologists and audiologists .....	73	110	37	51
Flight attendants .....	93	140	47	51
Guards .....	803	1,211	408	51
Insurance adjusters, examiners, and investigators .....	147	220	72	49
Respiratory therapists .....	74	109	36	48
Psychologists .....	143	212	69	48
Paving, surfacing, and tamping equipment operators .....	72	107	35	48

Table 4. Occupations with the largest job growth, 1992–2005, moderate alternative projection

[Numbers in thousands]

Occupation	Employment		Numerical change	Percent change
	1992	2005		
Salespersons, retail	3,660	4,446	786	21
Registered nurses	1,835	2,601	765	42
Cashiers	2,747	3,417	670	24
General office clerks	2,688	3,342	654	24
Truck drivers light and heavy	2,391	3,039	648	27
Waiters and waitresses	1,756	2,394	637	36
Nursing aides, orderlies, and attendants	1,308	1,903	594	45
Janitors and cleaners, including maids and housekeeping cleaners	2,862	3,410	548	19
Food preparation workers	1,223	1,748	524	43
Systems analysts	455	956	501	110
Home health aides	347	827	479	138
Teachers, secondary school	1,263	1,724	462	37
Child care workers	684	1,135	450	66
Guards	803	1,211	408	51
Marketing and sales worker supervisors	2,036	2,443	407	20
Teacher aides and educational assistants	885	1,266	381	43
General managers and top executives	2,871	3,251	380	13
Maintenance repairers, general utility	1,145	1,464	319	28
Gardeners and groundskeepers, except farm	884	1,195	311	35
Teachers, elementary	1,456	1,767	311	21
Food counter, fountain, and related workers	1,564	1,872	308	20
Receptionists and information clerks	904	1,210	305	34
Accountants and auditors	939	1,243	304	32
Clerical supervisors and managers	1,267	1,568	301	24
Cooks, restaurant	602	879	276	46
Teachers, special education	358	625	267	74
Licensed practical nurses	659	920	261	40
Cooks, short order and fast food	714	971	257	36
Human services workers	189	445	256	136
Computer engineers and scientists	211	447	236	112

trade (403,000 jobs); and construction (252,000 jobs). Nevertheless, operators fabricators, and laborers are projected to decline significantly as a share of total employment from 13.5 percent in 1992 to 12.1 percent in 2005.

### Detailed occupations

The Bureau has developed projections for more than 500 detailed occupations. The growth rates range from an increase of 138 percent for home health aides to a decline of 75 percent for frame wireers, central office, a much wider range, compared with that among the major occupational groups discussed in the previous section. (See table 2.) In the following discussion, employment change is analyzed from two perspectives, the projected rate of change and the size of the numerical change in employment among the occupations. In addition to numerical change, employment size of an occupation is a major factor in the number of future job openings because of the need to replace workers who leave the labor force or transfer to other occupations.

*Fastest growing occupations.* Most of the occupations with the fastest projected employment

growth are concentrated in one or more of the rapidly growing industries. A large number of the 30 occupations with the fastest projected growth rates are concentrated in the health services sector which is expected to increase about twice as fast as the economy as a whole.<sup>3</sup> (See table 3.) Many human services workers, who are classified in the detailed occupation with the second fastest projected growth rate, are employed in health services, social services, and State and local governments. These employees hold professional and paraprofessional jobs in facilities and programs that serve the elderly, the mentally impaired, and the developmentally disabled. Employment in two other rapidly growing occupations—home health aides and personal and home care aides—is concentrated in the home health care services and individual and miscellaneous social services industries. Home health aides are expected to be in great demand to provide personal and physical care for an increasing number of elderly people and for patients who are recovering from surgery and other serious health conditions. Personal and home care aides perform a variety of light housekeeping tasks for those in need of home care. Other occupations in the health field that are projected to grow rapidly include physical and corrective therapy assistants

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and aides; medical assistants; physical therapists; medical records technicians; occupational therapists; radiologic technologists and technicians; respiratory therapists; and speech-language pathologists and audiologists.

Robust growth is projected in some computer-related occupations attributable to the continuing spread of computer technology. Employment in the computer engineers and scientists and systems analysts occupations is expected to grow rapidly to satisfy expanding needs for scientific research and applications of computer technology in business and industry. Increasing use of operations research to improve productivity and reduce costs is expected to increase the demand for operations research analysts.

Other occupations that are expected to grow rapidly are travel agents and flight attendants. These occupations are expected to benefit from continued projected increases in personal and business travel. Paralegals are expected to be in great demand in legal and related fields attributable to efforts to provide more cost effective legal services to the public. Jobs for correction officers are projected to increase quickly in response to the

need to supervise and counsel a rapidly expanding inmate population. More child care workers are expected by 2005 as a result of anticipated growth in the number of young children and a change in the type of child care arrangements parents choose, that is, from an informal arrangement with family or friends to formal institutional child care. Finally, projected increases in student enrollments at the preschool and elementary school levels are expected to result in high rates of growth for preschool and kindergarten teachers and special education teachers.

*Occupations with the largest job growth.* Several of the detailed occupations with the largest numerical job growth (see table 4) are concentrated in three industries that are expected to provide nearly half of the total growth in wage and salary jobs from 1992 to 2005—retail trade, health services, and educational services. The occupation that is expected to have the second largest increase overall is registered nurses (765,000 jobs). Other health-related occupations with large projected numerical increases are nursing aides, orderlies, and attendants (594,000 jobs); licensed practical

Table 5. **Occupations with the largest job decline, 1992–2005, moderate alternative projection**

[Numbers in thousands]

Occupation	Employment		Numerical change	Percent change
	1992	2005		
Farmers . . . . .	1,088	857	-231	-21
Sewing machine operators, garment . . . . .	556	393	-162	-29
Cleaners and servants, private household . . . . .	483	326	-157	-32
Farmworkers . . . . .	849	716	-133	-16
Typists and word processors . . . . .	789	664	-125	-16
Child care workers, private household . . . . .	350	227	-123	-35
Computer operators, except peripheral equipment . . . . .	266	161	-104	-39
Packaging and filling machine operators and tenders . . . . .	319	248	-71	-22
Inspectors, testers, and graders, precision . . . . .	625	559	-65	-10
Switchboard operators . . . . .	239	188	-51	-21
Telephone and cable TV line installers and repairers . . . . .	165	125	-40	-24
Textile draw-out and winding machine operators and tenders . . . . .	192	157	-35	-18
Machine forming operators and tenders, metal and plastic . . . . .	155	123	-32	-21
Bartenders . . . . .	382	350	-32	-8
Butchers and meatcutters . . . . .	222	191	-31	-14
Billing, posting, and calculating machine operators . . . . .	93	66	-28	-29
Central office and fax installers and repairers . . . . .	70	45	-25	-36
Central office operators . . . . .	48	24	-24	-50
Bank tellers . . . . .	525	502	-24	-4
Electrical and electronic assemblers . . . . .	210	187	-23	-11
Cutting and slicing machine setters, operators and tenders . . . . .	94	73	-21	-23
Electrical and electronic equipment assemblers, precision . . . . .	150	129	-21	-14
Station installers and repairers, telephone . . . . .	40	20	-20	-50
Machine tool cutting operators and tenders, metal and plastic . . . . .	114	95	-19	-17
Peripheral EDP equipment operators . . . . .	30	12	-18	-60
Welding machine setters, operators, and tenders . . . . .	97	80	-17	-17
Crushing and mixing machine operators and tenders . . . . .	133	117	-16	-12
Industrial machinery mechanics . . . . .	477	462	-15	-3
Directory assistance operators . . . . .	27	13	-14	-51
Head sawyers and sawing machine operators and tenders, setters and set-up operators . . . . .	59	46	-13	-22

Table 6. Occupations with 50,000 or more self-employed workers, actual 1992 and projected to 2005

[Numbers in thousands]

Occupation	1992			2005			Change in self-employed, 1992-2005	
	Total employment	Self-employed	Percent of total employment	Total employment	Self-employed	Percent of total employment	Number	Percent
Total, all occupations . . . . .	121,099	10,009	8	147,482	11,501	8	1,492	15
Executive, administrative, and managerial occupations . . . . .	12,066	1,395	12	15,195	1,916	13	521	37
Managerial and administrative occupations . . . . .	8,411	1,110	13	10,427	1,562	15	452	41
Food service and lodging managers . . . . .	532	193	36	764	270	35	77	40
Property and real estate managers . . . . .	243	90	37	328	100	30	10	11
Management support occupations . . . . .	3,654	285	8	4,767	354	7	69	24
Accountants and auditors . . . . .	939	101	11	1,243	110	9	9	9
Management analysts . . . . .	208	85	41	297	125	42	40	47
Professional specialty occupations . . . . .	16,592	1,522	9	22,801	1,793	8	271	18
Social scientists . . . . .	258	84	33	353	120	34	36	43
Psychologists . . . . .	143	67	47	212	100	47	33	49
Lawyers and judicial workers . . . . .	716	217	30	913	234	26	17	8
Lawyers . . . . .	626	217	35	821	234	29	17	8
Teachers, librarians, and counselors . . . . .	5,984	149	2	8,010	178	2	29	19
Other teachers and instructors . . . . .	817	119	15	1,082	136	13	17	14
Adult and vocational education teachers . . . . .	540	119	22	712	136	19	17	14
Instructors, adult (nonvocational) education . . . . .	235	119	51	296	136	46	17	14
Health diagnosing occupations . . . . .	875	280	32	1,120	305	27	25	9
Dentists . . . . .	183	93	51	192	98	51	5	5
Physicians . . . . .	556	126	23	751	135	18	9	7
Health assessment and treating occupations . . . . .	2,436	60	2	3,482	78	2	18	30
Writers, artists, and entertainers . . . . .	1,806	553	34	2,012	637	32	84	15
Artists and commercial artists . . . . .	273	166	61	335	196	58	30	18
Designers . . . . .	302	108	36	359	114	32	6	6
Designers, except interior designers . . . . .	236	78	33	285	81	28	3	4
Musicians . . . . .	236	85	36	294	95	32	10	12
Writers and editors, including technical writers . . . . .	283	93	33	348	105	30	12	13
Technicians and related support occupations . . . . .	4,282	98	2	5,664	131	2	33	34
Marketing and sales occupations . . . . .	12,993	1,791	14	15,664	1,890	12	100	6
Insurance sales workers . . . . .	415	137	33	477	147	31	10	7
Marketing and sales worker supervisors . . . . .	2,036	750	37	2,443	782	32	32	4
Real estate agents, brokers, and appraisers . . . . .	397	252	63	461	272	59	20	8
Sales agents, real estate . . . . .	283	197	70	315	210	67	13	7
Salespersons, retail . . . . .	3,660	193	5	4,446	201	5	8	4
Administrative support occupations, including clerical . . . . .	22,349	313	1	25,406	318	1	5	2
Records processing occupations . . . . .	3,621	153	4	3,834	153	4	0	0
Financial records processing occupations . . . . .	2,686	150	6	2,770	150	5	0	0
Bookkeeping, accounting, and auditing clerks . . . . .	2,112	144	7	2,186	144	7	0	0
Secretaries, stenographers, and typists . . . . .	4,228	74	2	4,488	80	2	6	8
Service occupations . . . . .	19,358	1,076	6	25,820	1,542	6	466	43
Cleaning and building service occupations, except private household . . . . .	3,284	142	4	3,913	227	6	85	60
Janitors and cleaners, including maids and housekeeping cleaners . . . . .	2,862	127	4	3,410	210	6	83	65

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nurses (261,000 jobs); and home health aides (479,000 jobs). The latter occupation is also among the fastest growing occupations.

Within retail trade, the eating and drinking places industry, a very large and continually growing category, is expected to provide numerous additional jobs in many occupations, including waiters and waitresses (637,000 jobs); food preparation workers (524,000 jobs); food counter, foun-

tain, and related workers (308,000 jobs); cooks, restaurant (276,000 jobs); and cooks, short order and fast food (257,000 jobs). Other occupations in retail trade with large increases are cashiers; salespersons, retail; and marketing and sales-worker supervisors.

A projected increase in student enrollments of 14 percent from 1992 to 2005 is expected to spur the employment of teachers in elementary schools

Table 6. Continued—Occupations with 50,000 or more self-employed workers, actual 1992 and projected to 2005

[Numbers in thousands]

Occupation	1992			2005			Change in self-employed, 1992-2005	
	Total employment	Self-employed	Percent of total employment	Total employment	Self-employed	Percent of total employment	Number	Percent
Food preparation and service occupations	7,669	71	1	10,060	80	1	9	13
Personal service occupations	2,295	766	33	3,804	1,099	29	333	43
Barbers	71	56	79	69	56	81	0	0
Child care workers	684	392	57	1,135	630	56	238	61
Cosmetologists and related workers	676	315	47	915	410	45	95	30
Hairdressers, hairstylists, and cosmetologists	628	300	48	846	390	46	90	30
Protective service occupations	2,320	11	0	3,154	16	1	5	45
Agriculture, forestry, fishing, and related occupations	3,530	1,390	39	3,650	1,238	34	-152	-11
Farm operators and managers	1,218	1,081	89	1,014	850	84	-231	-21
Farmers	1,088	1,081	99	857	850	99	-231	-21
Gardeners and groundskeepers, except farm	884	179	20	1,195	255	21	76	42
Precision production, craft, and repair occupations	13,580	1,809	13	15,380	2,042	13	233	13
Blue-collar worker supervisors	1,757	168	10	1,974	190	10	22	13
Construction trades	3,510	972	28	4,295	1,175	27	203	21
Carpenters	978	400	41	1,176	475	40	75	19
Electricians	518	59	11	618	72	12	13	22
Painters and paperhangers, construction and maintenance	440	221	50	569	295	52	74	33
Plumbers, pipefitters, and steamfitters	351	60	17	378	64	17	4	7
Roofers	127	50	39	155	61	39	11	22
Mechanics, installers, and repairers	4,819	454	9	5,581	470	8	16	4
Machinery and related mechanics, installers, and repairers	1,696	63	4	2,005	70	3	7	11
Vehicle and mobile equipment mechanics and repairers	1,524	279	18	1,850	286	15	7	3
Automotive mechanics	739	186	25	907	200	22	14	8
Other mechanics, installers, and repairers	946	77	8	1,123	77	7	0	0
Production occupations, precision	2,956	209	7	2,965	201	7	-8	-4
Textile, apparel, and furnishings workers, precision	266	97	36	260	88	34	-9	-9
Custom tailors and sewers	113	69	61	109	63	58	-6	-9
Operators, fabricators, and laborers	16,349	615	4	17,902	630	4	16	3
Machine setters, set-up operators, operators, and tenders	4,676	91	2	4,326	86	2	-6	-6
Hand workers, including assemblers and fabricators	2,528	105	4	2,630	115	4	10	10
Transportation and material moving machine and vehicle operators	4,694	341	7	5,719	349	6	8	2
Motor vehicle operators	3,429	300	9	4,285	310	7	10	3
Truck drivers	2,720	245	9	3,428	248	7	3	1
Truck drivers light and heavy	2,391	225	9	3,039	225	7	0	0
Helpers, laborers, and material movers, hand	4,451	78	2	5,227	81	2	3	4

by 311,000 and in secondary schools by 462,000. The trend toward greater use of teacher aides and educational assistants is expected to continue through 2005 and result in an increase of 381,000 additional jobs for these workers in elementary and secondary schools.

The remaining occupations listed in table 4 are found in a wide variety of industries throughout the economy and their growth, as a consequence, is dependent upon many factors. As mentioned in the previous section, employment for systems analysts is expected to grow with the continued spread of computer technology. Jobs for receptionists and information clerks are projected to increase significantly because such workers interact a great deal with people and their duties are difficult to automate. General office clerks are expected to continue to replace other administrative support workers, including clerical workers who have a limited number of functions. Other very large and slower growing occupations that are expected to provide numerous additional jobs are general managers and top executives; truckdrivers, light and heavy; janitors and cleaners; marketing and salesworkers supervisors; and guards.

An interesting comparison exists between the total increase in employment from those occupations that are projected as the fastest growing (table 3) and the increase from those projected to account for the largest numerical increase (table 4). The first group accounts for 17 percent of the projected overall growth in employment, while the second group accounts for almost 50 percent (several occupations are included in both of the groups). These statistics illustrate why both the numerical change and the rate of change should be considered when analyzing occupational employment projections.

**Declining occupations.** Projected declines in industry employment and changes in occupational staffing patterns are expected to reduce the demand for workers in some occupations over the 1992–2005 period. (See table 5.) This section focuses on those occupations with the largest job declines rather than on those with the fastest rates of decline. Many detailed occupations in the latter category are very small and, consequently, the resulting employment declines are not very significant.

Industry employment change is the major cause of projected employment declines for farmers; textile draw-out and winding machine operators and tenders; electrical and electronic equipment assemblers, precision; electrical and electronic assemblers; and two occupations in the private household industry—cleaners and servants and child care workers. Declining occupations that are expected to be affected almost

Table 7. **Employment change classified by occupational employment factors and major occupational group, 1992–2005**

[Employment in millions]

Occupation	Total change	Change due to industry change	Change due to occupational structure change
Total, all occupations <sup>1</sup> . . . . .	26.4	26.4	0.0
Executive, administrative, and managerial . . . . .	3.1	3.0	.1
Professional specialty . . . . .	6.2	4.7	1.5
Technicians and related support . . . . .	1.4	1.3	.1
Marketing and sales . . . . .	2.7	2.4	.3
Administrative support, including clerical . . . . .	3.1	5.2	-2.1
Service . . . . .	6.5	6.2	.3
Agriculture, forestry, and fishing . . . . .	.1	( <sup>2</sup> )	( <sup>2</sup> )
Precision production, craft, and repair . . . . .	1.8	1.8	( <sup>2</sup> )
Operators, fabricators, and laborers . . . . .	1.6	1.7	-.1

<sup>1</sup> At the total, all occupations level, the net change due to occupational structure is zero because changes to any detailed occupation must be counterbalanced by a change in the opposite direction to one or more different occupations.

<sup>2</sup> Fewer than 100,000 workers.

equally by industry employment changes and by occupational structure changes include farmworkers; central office and PBX installers and repairers; central office operators; station installers and repairers; and directory assistance operators.

Most of the other declining occupations are affected more by occupational structure changes than by industry employment changes. The large decline in employment for bartenders in the eating and drinking places industry is attributable to the projected decline in the consumption of alcoholic beverages outside of the home. Overall, the employment of bartenders is projected to decline by 32,000 jobs. The use of typists and word processors is expected to decrease significantly in most industries because of productivity improvements resulting from office automation and the increased use of word processing equipment by professional and managerial employees. Job losses for these workers are expected to be very substantial—125,000 jobs. The demand for computer operators, except peripheral equipment is expected to fall due to an expected decrease in the use of mainframe computers relative to personal computers. Employment for bank tellers is expected to decline because of increased use of automated teller machines, terminals, and other electronic equipment for customer fund transactions.

Several occupations in manufacturing are expected to decline because of technological advances, organizational changes, and other factors that affect the use of workers. For example, the installation of computer-controlled technology, including advanced systems that combine production tasks and link machines, will reduce

Table 8. **Total job openings due to replacements and due to projected employment change in occupations with employment of 250,000 or more, 1992–2005**

[Employment in thousands]

Occupation title	1992 total employment	Job openings, 1992–2005		
		Total	Due to growth <sup>1</sup>	Due to net replacements
Total, all occupations . . . . .	121,099	60,286	28,564	31,722
Executive, administrative, and managerial occupations . . . . .	12,066	5,677	3,135	2,542
Managerial and administrative occupations . . . . .	8,411	3,851	2,016	1,835
Education administrators . . . . .	351	189	81	108
Engineering, mathematical, and natural science managers . . . . .	337	177	106	71
Financial managers . . . . .	701	318	174	144
Food service and lodging managers . . . . .	532	343	232	111
General managers and top executives . . . . .	2,871	980	380	600
Marketing, advertising, and public relations managers . . . . .	432	261	156	105
Management support occupations . . . . .	3,654	1,827	1,119	708
Accountants and auditors . . . . .	939	477	304	173
Personnel, training, and labor relations specialists . . . . .	281	160	102	58
Professional specialty occupations . . . . .	16,592	9,781	6,210	3,571
Engineers . . . . .	1,354	670	307	363
Electrical and electronics engineers . . . . .	370	192	90	102
Computer, mathematical, and operations research occupations . . . . .	758	846	772	75
Computer systems analysts, engineers, and scientists . . . . .	666	794	737	57
Systems analysts . . . . .	455	540	501	39
Social scientists . . . . .	258	142	95	46
Social, recreational, and religious workers . . . . .	1,130	767	601	167
Social workers . . . . .	484	256	191	65
Lawyers and judicial workers . . . . .	716	329	197	132
Lawyers . . . . .	626	309	195	114
Teachers, librarians, and counselors . . . . .	5,984	3,381	2,026	1,355
Teachers, elementary . . . . .	1,456	671	311	361
Teachers, preschool and kindergarten . . . . .	434	287	236	51
Teachers, special education . . . . .	358	324	267	57
Teachers, secondary school . . . . .	1,263	853	462	392
College and university faculty . . . . .	812	505	214	291
Other teachers and instructors . . . . .	817	315	266	49
Instructors and coaches, sports and physical training . . . . .	260	110	94	16
Adult and vocational education teachers . . . . .	540	204	172	33
Teachers and instructors, vocational education and training . . . . .	305	130	111	18
Health diagnosing occupations . . . . .	875	459	246	213
Physicians . . . . .	556	322	195	127
Health assessment and treating occupations . . . . .	2,436	1,528	1,046	482
Registered nurses . . . . .	1,835	1,123	765	358
Therapists . . . . .	329	267	201	66
Writers, artists, and entertainers . . . . .	1,606	757	406	352
Artists and commercial artists . . . . .	273	124	63	62
Designers . . . . .	302	115	57	58
Writers and editors, including technical writers . . . . .	283	114	66	48

See footnotes at end of table.

the demand for machine forming operators and tenders, metal and plastic and for machine tool cutting operators and tenders, metal and plastic. Similarly, welding machine setters, operators, and tenders are expected to be affected by the further diffusion of robotics technology.

### Self-employed workers

The number of self-employed workers is projected to increase from 10.0 million in 1992 to 11.5 million in 2005, or by 15 percent. (See table 6.) This rate of growth is somewhat slower than the projected increase of 23 percent for wage and salary workers. Among the detailed occupations with 50,000 employees or more, however, there is a great deal of variation in the projected rates of growth for self-employed workers, and in some occupations, the growth rate greatly exceeds the rate of increase projected for wage and salary workers.

From 1992 to 2005, executive, administrative, and managerial occupations are expected to account for more than one-third of the increase in self-employed workers—521,000 jobs of 1.5 million. As in the recent past, employment growth of self-employed managers is expected to be faster than that for their wage and salary counterparts. Many individuals will continue to start up and manage their own businesses, whereas employment growth of wage and salary managers will be negatively affected by job restructuring as described earlier.

The next largest increase in self-employment (466,000 jobs) is expected in service occupations. Numerous additional opportunities (238,000) are expected for self-employed child care workers as more and more families turn away from at-home child care to institutional care. Other occupations with projected increases in self-employed workers include janitors and cleaners, including maids and housekeeping cleaners (83,000) and hairdressers, hairstylists, and cosmetologists (90,000).

Other groups that will provide opportunities for self-employment are professional specialty occupations (271,000) and precision production, craft, and repair occupations (233,000). Both of these groups have a large number of detailed occupations in which the proportion of self-employed workers to all workers is significantly high.

Occupations in the marketing and sales fields had the most self-employed workers in 1992, 1.8 million, but are projected to increase by only 100,000 workers, or 6 percent, from 1992 to 2005. Self-employed workers in this occupational group are expected to grow more slowly than their wage and salary counterparts in medium-sized and large establishments in industries that employ these workers. However, in many sales occupations, in-

cluding real estate agents and insurance agents, the self-employed will still account for a sizable portion of total employment in 2005.

While the number of self-employed technicians and related support workers is projected to grow rapidly (34 percent), the low employment base of 98,000 jobs in 1992 is expected to yield growth of only 33,000 jobs from 1992 to 2005. Two other major occupational groups are also expected to have little increase in self-employment through 2005—administrative support occupations, including clerical and operators, fabricators, and laborers.

Within the major group, agriculture, forestry, fishing, and related occupations, the number of self-employed farmers is projected to continue the descending trend, falling by about 231,000, attributable to a reduction in the number of smaller farms. The one occupation in this major group which is expected to experience significant growth in the number of self-employed workers is gardeners and groundskeepers (76,000).

### Factors underlying changes

The projected changes in occupational employment can be attributed statistically to projected shifts in industry employment and to projected changes in the occupational structure of industries. Industry employment shifts result from changes in interindustry purchases and in the structure of final demand, such as reductions in defense expenditures and increases in exports. These, in turn, are influenced by technological change, product development, and relative prices. Occupational structure changes reflect such things as organizational changes and job restructuring. These changes in the use of workers by occupation within an industry result primarily from technological change.

The method of determining how much of the projected employment change is attributable to industry change and how much to changes in the occupational structure of industries incorporates a three-step procedure using the industry-occupational employment matrix. In the first step, the actual projected change in employment by occupation was computed by subtracting the 1992 employment for an individual occupation from the 2005 projected employment for the same occupation. This calculation represents the total employment change for the occupation caused by both the industry employment changes and by the projected occupational staffing pattern changes.

In the second step, the occupational staffing pattern distribution of industries shown in the 1992 matrix was multiplied by the 2005 projected industry employment totals. The resulting employment totals indicate the employment that

Table 8. **Continued—Total job openings due to replacements and due to projected employment change in occupations with employment of 250,000 or more, 1992–2005**

[Employment in thousands]

Occupation title	1992 total employment	Job openings, 1992–2005		
		Total	Due to growth <sup>1</sup>	Due to net replacements
Technicians and related support occupations . . . . .	4,282	2,361	1,385	976
Health technicians and technologists . . . . .	2,028	1,211	823	388
Clinical lab technologists and technicians . . . . .	268	125	71	54
Licensed practical nurses . . . . .	659	396	261	135
Engineering and science technicians and technologists . . . . .	1,253	557	229	328
Engineering technicians . . . . .	695	280	132	148
Electrical and electronic technicians/technologists . . . . .	323	127	74	53
Drafters . . . . .	314	148	35	113
Technicians, except health and engineering and science . . . . .	1,001	593	333	260
Computer programmers . . . . .	555	340	169	172
Marketing and sales occupations . . . . .	12,993	6,973	2,671	4,302
Cashiers . . . . .	2,747	1,858	670	1,188
Insurance salesworkers . . . . .	415	176	62	114
Marketing and salesworker supervisors . . . . .	2,036	850	407	443
Real estate agents, brokers, and appraisers . . . . .	397	148	63	85
Sales agents, real estate . . . . .	283	92	32	60
Salespersons, retail . . . . .	3,660	2,167	786	1,381
Administrative support occupations, including clerical . . . . .	22,349	9,021	3,473	5,548
Adjusters, investigators, and collectors . . . . .	1,152	521	358	163
Adjustment clerks . . . . .	352	129	93	36
Insurance claims and policy processing occupations . . . . .	434	226	149	76
Communications equipment operators . . . . .	327	108	0	108
Telephone operators . . . . .	314	104	0	104
Computer operators and peripheral equipment operators . . . . .	296	96	0	96
Computer operators, except peripheral equipment . . . . .	266	86	0	86
Information clerks . . . . .	1,333	744	429	314
Receptionists and information clerks . . . . .	904	479	305	173
Mail clerks and messengers . . . . .	271	106	26	80
Postal clerks and mail carriers . . . . .	361	103	3	101
Postal mail carriers . . . . .	297	84	3	81
Material recording, scheduling, dispatching, and distributing occupations . . . . .	3,588	1,347	462	886
Stock clerks . . . . .	1,782	659	158	502
Traffic, shipping, and receiving clerks . . . . .	824	283	147	136
Records processing occupations . . . . .	3,621	1,261	247	1,014
File clerks . . . . .	257	160	48	112
Financial records processing occupations . . . . .	2,686	820	113	707
Billing, cost, and rate clerks . . . . .	315	144	39	105
Bookkeeping, accounting, and auditing clerks . . . . .	2,112	583	73	510
Order clerks, materials, merchandise, and service . . . . .	300	94	13	80

See footnote at end of table.



Table 8. **Continued—Total job openings due to replacements and due to projected employment change in occupations with employment of 250,000 or more, 1992–2005**

[Employment in thousands]

Occupation title	1992 total employment	Job openings, 1992–2005		
		Total	Due to growth <sup>1</sup>	Due to net replacements
Secretaries, stenographers, and typists .....	4,228	1,531	386	1,145
Secretaries .....	3,324	1,326	386	940
Legal secretaries .....	280	239	160	79
Secretaries, except legal and medical .....	2,810	915	120	794
Typists and word processors ..	789	173	0	173
Other clerical and administrative support workers .....	7,172	3,203	1,562	1,640
Bank tellers .....	525	268	0	268
Clerical supervisors and managers .....	1,267	687	301	386
Data entry keyers, except composing .....	432	126	83	43
General office clerks .....	2,688	1,238	654	584
Teacher aides and educational assistants .....	885	502	381	121
Service occupations .....	19,358	12,655	6,780	5,875
Cleaning and building service occupations, except private household .....	3,284	1,389	629	760
Janitors and cleaners, including maids and housekeeping cleaners .....	2,862	1,197	548	649
Food preparation and service occupations .....	7,669	5,556	2,423	3,133
Chefs, cooks, and other kitchen workers .....	3,092	2,135	1,190	945
Cooks, except short order ..	1,155	740	409	331
Cooks, institution or cafeteria .....	406	180	64	116
Cooks, restaurant .....	602	449	276	173
Cooks, short order and fast food .....	714	461	257	205
Food preparation workers ..	1,223	934	524	409
Food and beverage service occupations .....	4,365	3,260	1,156	2,105
Bartenders .....	382	161	0	161
Dining room and cafeteria attendants and bar helpers ..	441	364	131	232
Food counter, fountain, and related workers .....	1,564	1,028	308	720
Waiters and waitresses .....	1,756	1,586	637	948
Health service occupations .....	2,041	1,382	1,032	350
Nursing aides and psychiatric aides .....	1,389	838	616	221
Nursing aides, orderlies, and attendants .....	1,308	803	594	208
Personal service occupations .....	2,295	1,923	1,510	413
Child care workers .....	684	512	450	62
Cosmetologists and related workers .....	676	366	240	127
Hairdressers, hairstylists, and cosmetologists .....	628	335	218	118
Homemaker-home health aides .....	475	720	645	75
Home health aides .....	347	535	479	55
Private household workers .....	869	263	0	263
Child care workers, private household .....	350	174	0	174

See footnote at end of table.

would occur if the projected changes in industry employment were the only factor affecting projected occupational employment. The 1992 occupational employment was then subtracted from the 2005 occupational employment level resulting from this step. This subtraction yielded the amount of occupational employment changes attributable to industry change.

In the final step, the employment change for an occupation calculated in step two was subtracted from the total employment change for each occupation obtained in step one. The resulting total represents the occupational employment change attributable to occupational structure change and the interaction of occupational structure change and industry employment change.

Table 7 shows the amount of projected employment change over the 1992–2005 period, aggregated to the major occupational group level, that is attributable to projected changes in industry employment and to projected changes in the occupational structure of industries. Most of the change shown for the occupational groups is attributable to projected changes in industry employment. It is especially noteworthy that almost all of the estimated employment change for service occupations is attributable to industry change and relatively little is due to occupational structure change. Two occupational groups, however, administrative support workers, including clerical and professional specialty occupations have significant employment change attributable to expected changes in occupational structure. Furthermore, as discussed earlier, changes in occupational structure can have significant effects on employment in detailed occupations. The proportion of the total change attributable to structure changes for a detailed occupation can vary considerably from the average structure change at the major occupational group level. For example, occupational structure changes account for less than 10 percent of the total change in employment for technicians and related support occupations. However, for paralegals, one of the detailed occupations in this group, more than half of the employment growth is attributable to structure changes which reflect increasing employment of these workers as a useful cost-effective part of the legal services team.

### Replacements and job openings

In addition to occupational employment growth, another aspect of the demand for workers is the need to replace workers who leave their jobs to enter other occupations, retire, or leave the labor force for other reasons. Job openings resulting from replacement needs are very important because in most occupations, they exceed those resulting from employment growth. Even occupa-

tions that are projected to decline provide some job openings. (See table 8.)

The measurement of replacement needs is very complex because there is a continuous movement of workers into and out of occupations. The measure used in this article is based on the net change in employment (entrants minus separations) in each age cohort over the projection period.<sup>4</sup> Consequently, net replacements do not measure all workers who leave an occupation or represent the total number of jobs that will be filled due to the need to replace workers. These net replacements understate the total number of job openings in an occupation because they relate only to the *net* movement of experienced workers who enter or leave that occupation. However, net replacements are used in this article because the measure best represents the job openings for new labor force entrants over the projection period.<sup>5</sup>

By 2005, more job openings are expected to result from replacement needs (31.7 million) than from employment growth in the economy (28.6 million). However, this pattern varies considerably among the major occupational groups and detailed occupations. For example, executive, administrative, and managerial occupations; professional specialty occupations; and technicians and related support occupations, all of which are projected to grow faster than average, provide many more openings attributable to growth than to net replacements. In contrast, for the major occupational groups that are projected to grow more slowly than average—administrative support occupations, including clerical; precision production, craft, and repair occupations; operators, fabricators, and laborers; and farming, forestry, and fishing occupations—the numbers of job openings attributable to net replacements are expected to exceed greatly those due to growth.

The number of job openings for service occupations through 2005 is projected to be 12.7 million and to exceed the number for professional occupations, the next largest group, by 2.9 million. Accounting for 21 percent of the total, numerous openings for service workers are expected to result from both net replacements and employment growth. The majority of replacements are expected to result from the movement of young workers in food preparation and service occupations to other occupations.

### Educational requirements and earnings

This section focuses on implications of the continuing occupational restructuring of the U.S. economy on future educational requirements and earnings of workers. The Bureau does not project educational attainment and average earnings by occupation because both are affected by so many

Table 8. **Continued—Total job openings due to replacements and due to projected employment change in occupations with employment of 250,000 or more, 1992–2005**

[Employment in thousands]

Occupation title	1992 total employment	Job openings, 1992–2005		
		Total	Due to growth <sup>1</sup>	Due to net replacements
Cleaners and servants, private household .....	483	82	0	82
Protective service occupations .....	2,320	1,615	834	781
Firefighting occupations .....	305	185	50	135
Law enforcement occupations .....	982	626	289	337
Correction officers .....	282	239	197	41
Police and detectives .....	700	388	92	296
Police patrol officers .....	411	246	57	189
Other protective service workers .....	1,034	804	495	309
Guards .....	803	598	408	190
Agriculture, forestry, fishing, and related occupations .....	3,530	1,228	489	739
Farm occupations .....	921	368	44	324
Farmworkers .....	849	299	0	299
Farm operators and managers .....	1,218	184	27	156
Farmers .....	1,088	133	0	133
Gardeners and groundskeepers, except farm .....	884	428	311	117
Precision production, craft, and repair occupations .....	13,580	6,100	2,113	3,987
Blue-collar worker supervisors .....	1,757	823	217	606
Construction trades .....	3,510	1,760	786	974
Carpenters .....	978	467	198	269
Electricians .....	518	232	100	132
Painters and paperhangers, construction and maintenance .....	440	254	128	126
Plumbers, pipefitters, and steamfitters .....	351	131	27	104
Mechanics, installers, and repairers .....	4,819	2,275	884	1,391
Electrical and electronic equipment mechanics, installers, and repairers .....	545	208	53	155
Machinery and related mechanics, installers, and repairers .....	1,696	739	325	414
Industrial machinery mechanics .....	477	147	0	147
Maintenance repairers, general utility .....	1,145	554	319	235
Vehicle and mobile equipment mechanics and repairers .....	1,524	856	327	529
Automotive mechanics .....	739	440	168	272
Bus and truck mechanics and diesel engine specialists .....	263	152	64	88
Other mechanics, installers, and repairers .....	946	444	179	265
Production occupations, precision .....	2,956	1,051	174	877
Assemblers, precision .....	334	100	9	91
Food workers, precision .....	305	107	5	102
Inspectors, testers, and graders, precision .....	625	173	0	173
Metal workers, precision .....	854	302	43	259
Machinists .....	352	99	0	99
Textile, apparel, and furnishings workers, precision .....	266	73	7	66
Plant and system occupations .....	308	137	34	103

See footnote at end of table.

Table 8. **Continued—Total job openings due to replacements and due to projected employment change in occupations with employment of 250,000 or more, 1992–2005**

[Employment in thousands]

Occupation title	1992 total employment	Job openings, 1992–2005		
		Total	Due to growth <sup>1</sup>	Due to net replacements
Operators, fabricators, and laborers .....	16,349	6,489	2,307	4,183
Machine setters, set-up operators, operators, and tenders .....	4,676	1,595	241	1,354
Machine tool cut and form setters, operators, and tenders, metal and plastic .....	674	182	0	182
Metal and plastic processing machine setters, operators, and related workers .....	399	151	13	137
Printing, binding, and related workers .....	375	177	73	104
Textile and related setters, operators, and related workers .....	1,041	301	8	293
Sewing machine operators, garment .....	556	152	0	152
Other machine setters, set-up operators, operators, and tenders .....	1,741	617	107	509
Packaging and filling machine operators and tenders .....	319	80	0	80
Hand workers, including assemblers and fabricators .....	2,528	879	251	628
Welders and cutters .....	306	150	46	103
Transportation and material moving machine and vehicle operators .....	4,694	2,064	1,028	1,035
Motor vehicle operators .....	3,429	1,610	856	754
Bus drivers .....	562	217	119	98
Bus drivers, school .....	395	178	109	69
Truck drivers .....	2,720	1,345	708	637
Driver/sales workers .....	329	169	60	110
Truck drivers light and heavy .....	2,391	1,176	648	527
Material moving equipment operators .....	983	367	129	238
Industrial truck and tractor operators .....	413	141	29	112
Helpers, laborers, and material movers, hand .....	4,451	1,952	786	1,166
Freight, stock, and material movers, hand .....	845	309	111	198
Hand packers and packagers .....	685	270	85	185
Helpers, construction trades .....	452	279	79	200
Machine feeders and offbearers .....	255	102	2	100

<sup>1</sup> Job openings due to growth are a result of summing the employment increases for detailed occupations within each of the occupational groups shown in this table.

factors related to the demand and supply of workers in an occupation. Nevertheless, it is possible to examine what would happen to educational attainment and earnings over the 1992–2005 period if occupational employment were to change as projected, but educational attainment and earnings of detailed occupations remained unchanged at 1992 levels. While this scenario is unlikely to hap-

pen, the simulation provides insight into whether the Bureau's latest projections of employment for detailed occupations imply higher or lower levels of educational requirements and earnings in 2005 than in 1992 for the economy as a whole and for each of the major occupational groups.

The simulation was prepared because the implications of numerous projected changes to the occupational structure on future educational attainment and earnings are not clear. Employment is projected to increase faster than average in the three major occupational groups in which workers generally require education or training beyond high school—executive, administrative, and managerial occupations; professional specialty occupations; and technicians and related support occupations. These occupational groups had the largest proportions of workers completing at least 4 years of college in 1992 and the smallest proportions with less than a high school education. In 1992, workers in these occupational groups also had the highest median earnings among the major occupational groups. One other group, service occupations, is also projected to grow faster than average, but relatively few service workers had a college degree in 1992 and a high proportion had less than a high school education. Also, median earnings of service workers was the lowest among the major occupational groups. In addition, within each of the major occupational groups, there is significant variation in educational attainment and earnings among the detailed occupations. What, then, do the projected changes in occupational structure from 1992 to 2005 imply for future levels of educational attainment and earnings?

Of course, many factors will affect educational requirements and earnings of occupations over the 1992–2005 period. Changes in technology and in the organization of work will have a significant impact, as well as a wide variety of factors, according to economic theory. Yet, over time, the rankings of occupations by earnings has remained relatively stable as have the educational attainment levels of workers among occupations.<sup>6</sup> Thus, using the educational attainment and earnings of workers in specific occupations in 1992 as a proxy for relative earnings in 2005 provides some insight into the implications of the projected changes in the occupational employment structure on the levels of earnings and educational attainment in 2005.

Specifically, the 1992 educational attainment distributions and median weekly earnings of detailed occupations were weighted by projected employment estimates for 2005 and the results aggregated to the major occupational groups.<sup>7</sup> The projected 2005 estimates of educational attainment and median weekly earnings were then compared with the 1992 estimates for the same categories. (See table 9.) Using this method, we were

Table 9. **Distribution of employment in major occupational groups by educational attainment and median weekly earnings, 1992 and projected 2005, based on 1992–2005 employment shifts in detailed occupations**

[Employment in thousands]

Occupation	Total employment		Educational attainment										Median weekly earnings	
	1992	2005	Total, all workers		College graduate		Some college		High school graduate		Less than 12 years		1992	2005
			1992	2005	1992	2005	1992	2005	1992	2005	1992	2005		
Total, all occupations . . . . .	121,099	147,482	100.0	100.0	22.6	24.0	27.2	27.4	35.8	34.9	14.3	13.8	406	409
Executive, administrative, and managerial occupations . . . . .	12,066	15,195	100.0	100.0	47.2	47.7	27.2	27.2	21.7	21.7	3.2	3.2	652	649
Professional specialty occupations . . . . .	16,592	22,801	100.0	100.0	71.5	71.2	19.6	19.8	7.7	7.7	1.3	1.3	596	597
Technicians and related support occupations . . . . .	4,282	5,664	100.0	100.0	28.9	29.3	45.3	45.9	23.2	23.4	2.5	2.5	488	483
Marketing and sales occupations . . . . .	12,993	15,664	100.0	100.0	22.0	22.4	32.0	32.4	33.1	33.5	12.3	12.5	346	343
Administrative support occupations, including clerical . . . . .	22,349	25,406	100.0	100.0	13.1	13.4	37.5	37.7	43.6	43.8	6.0	6.1	341	339
Service occupations . . . . .	19,358	25,820	100.0	100.0	6.4	6.5	25.4	25.8	40.8	40.8	27.0	25.9	232	234
Agriculture, forestry, fishing, and related occupations . . . . .	3,530	3,650	100.0	100.0	7.7	7.3	17.2	17.8	38.2	37.6	36.7	37.5	258	255
Precision production, craft, and repair occupations . . . . .	13,580	15,380	100.0	100.0	6.3	6.3	26.2	26.1	49.1	48.7	18.7	18.7	470	468
Operators, fabricators, and laborers . . . . .	16,349	17,902	100.0	100.0	3.4	3.5	17.7	18.1	52.1	52.0	28.1	27.8	331	333

NOTE: Projected 2005 is the change due only to detailed projected occupational employment shifts, 1992–2005.

able to isolate the effect of projected changes in employment by detailed occupation on educational attainment and on earnings levels at the major occupational group and in the aggregate across all occupations.

In general, an analysis of the results indicates relatively modest changes. At the aggregate level, the proportion of workers who are college graduates increases by 1.4 percentage points while those with some college (1 to 3 years) increase very slightly. The proportion of high school graduates decreases by almost 1 percentage point while those with less than a high school education decrease slightly. Therefore, the occupational distribution of projected employment contributes in an important way toward increasing jobs for workers with a college degree, while decreasing it for workers with a high school education or less. Median weekly earnings for both groups, however, would remain virtually unchanged from 1992 to 2005 at both the aggregate level and the major group level because of projected occupational employment shifts. The reason the analysis indicates relatively small changes in the levels of earnings is that the shares of employment accounted for by professional employees and service workers are expected to increase by about the same amount—1.8 percentage points and 1.5 percentage points respectively. These two major groups, which together are projected to provide almost half of the future job growth, are on opposite ends of the

earnings spectrum. Therefore, the positive effect of an increase in jobs for professional workers (6.2 million) on median earnings levels for the total work force is expected to be offset by the slightly larger increase in jobs for service workers (6.5 million) who have much lower levels of earnings. In fact, earnings for service workers were about 40 percent below the average for all occupational groups in 1992. Part of the reason is that almost a third of these employees had less than a high school education and twice as many worked part-time than the average for all workers. Therefore, it is evident that the proportion of professional workers—and probably managers and technicians as well—would have to increase even faster than already projected in order for occupational restructuring to raise significantly the levels of average earnings for the work force as a whole by 2005.

#### Alternative projections

The discussion of projections of occupational employment through the year 2005 thus far has focused on the moderate alternative of the three sets of projections developed by BLS. This section presents a brief analysis of the differences in employment at the major occupational group level between the moderate-trend projections and the low-trend and high-trend projections. Compared with a projected rate of growth of 22 percent for total employment in the moderate projection,

Table 10. Percent distribution of employment by occupation, 1992 and projected 2005 alternatives

Occupation	1992	2005		
		Low	Moderate	High
Total, all occupations	100.0	100.0	100.0	100.0
Executive, administrative, and managerial occupations	10.0	10.3	10.3	10.4
Professional specialty occupations	13.7	15.6	15.5	15.3
Technicians and related support occupations	3.5	3.8	3.8	3.8
Marketing and sales occupations	10.7	10.5	10.6	10.6
Administrative support occupations, including clerical	18.5	17.2	17.2	17.1
Service occupations	16.0	17.7	17.5	17.1
Agriculture, forestry, fishing, and related occupations	2.9	2.5	2.5	2.5
Precision production, craft, and repair occupations	11.2	10.4	10.4	10.8
Operators, fabricators, and laborers	13.5	11.9	12.1	12.4

Table 11. Employment in detailed occupations for 1992 and projected to 2005 in the moderate trend alternative and difference between employment in the low- to high-trend alternative

Occupation	Employment, moderate trend (in thousands)		Employment difference, low to high trend
	1992	2005	
Salespersons, retail	3,660	4,446	472
Truck drivers, light and heavy	2,391	3,039	397
General managers and top executives	2,871	3,251	358
General office clerks	2,688	3,342	333
Cashiers	2,747	3,417	313
Secretaries, except legal and medical	2,810	2,930	290
Blue-collar worker supervisors	1,757	1,974	285
Marketing and salesworker supervisors	2,036	2,443	257
Janitors and cleaners	2,862	3,410	255
Bookkeeping, accounting, and auditing clerks	2,112	2,186	229

growth rates are expected to be 15 percent in the low-trend and 27 percent in the high-trend alternative. (See table 2.)

The distribution of total employment by major occupational group varies little among the three sets of projections alternatives for 2005 because of offsetting changes among the detailed occupations within each of the major groups. (See table 10.) Among the detailed occupations, however, significant numerical differences exist between each of the alternatives. In fact, even the direction of projected employment for an occupation from 1992 to 2005 can be different among the alternatives. For example, the furnace operators and tenders occupation is projected to decline in employment in both the low and moderate alternatives, and is projected to increase in employment in the high alternative. The differences in projected occupational employment among the alternatives are caused only by differences in the

projected levels of industry employment, because the same set of occupational staffing patterns by industry were used in all three projections alternatives.

In the high-trend alternative, total employment in 2005 is 14.9 million higher than in the low-trend alternative. Therefore, the range in projected employment for detailed occupations can be very wide, particularly for occupations of large size as shown in table 11. □

## Footnotes

Note: The occupational projections presented in this article provide information to those interested in labor market issues. They also provide the background for analyses of future employment opportunities described in the BLS publication, *Occupational Outlook Handbook*. Job outlook information in the 1994-95 edition of the *Handbook*, scheduled for release in the spring of 1994, will use the projections presented in each of the articles that make up The American work force: 1992-2005.

<sup>1</sup> The 1992 employment estimates described in this article are derived from the Bureau's industry-occupation employment matrix which includes data for more than 500 detailed occupations and 250 detailed industries. The main sources of data used in the matrix are Current Employment Statistics (CES) estimates for total wage and salary jobs by industry and Occupational Employment Statistics (OES) data for employment by occupation within detailed industries. Total employment and occupational staffing patterns of wage and salary workers in agriculture, forestry, fishing, hunting, and trapping and in private households are derived from the Current Population Survey (CPS). Economy-wide data on self-employed and unpaid family workers by occupation are also derived from the CPS. The estimates derived from the CES and OES differ from those obtained from the CPS in a number of important ways. For example, employed persons who hold more than one job are included twice in the CES and OES estimates, but only once in the CPS data, which excludes the secondary jobs of workers.

<sup>2</sup> The services industry division in the industry-occupation matrix includes State and local government hospitals and education. In the article on industry employment (pages 41-57) workers in State and local government hospitals and education are included in the estimates of government employment.

<sup>3</sup> This analysis excludes miscellaneous residual occupational groups and occupations with fewer than 25,000 workers in 1992.

<sup>4</sup> See the discussion on the uses of replacement needs information developed in *Occupational Projections and Training Data* (Bureau of Labor Statistics, 1992), p. 90.

<sup>5</sup> See *Occupational Projections and Training Data*.

<sup>6</sup> See Steven Hitchcock, "Ranking Occupational Earnings," *Occupational Outlook Quarterly* (Bureau of Labor Statistics, Fall 1990).

<sup>7</sup> The 1992 data on educational attainment and median weekly earnings by detailed occupation were obtained from the CPS. The earnings data by occupation relate to full-time and part-time wage and salary workers and do not include data on self-employed and unpaid family workers. The educational attainment data, however, include all classes of full-time and part-time employees.