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Programs Funded by the H-1B Visa Education and Training Fee, and Labor Market Conditions for Information Technology (IT) Workers

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Summary

Congress has repeatedly turned to immigration as a means of immediately alleviating a perceived shortage of U.S. workers with information technology (IT) skills. It temporarily raised the ceiling on newly approved H-1B professional specialty visas in 1998 and in 2000, from the level of 65,000 set by the Immigration and Nationality Act of 1990. After the elevated cap reverted to 65,000 in October 2003, the H-1B visa ceiling has been reached earlier in each year.

When the 105th Congress raised the H-1B visa ceiling, it also initiated what was intended as a longer term strategy to remedy the seeming mismatch between the qualifications of U.S. workers and the skill requirements of U.S. employers: the imposition of a user fee on employers that seek to utilize nonimmigrant professionals to fund programs that prepare U.S. students and workers for computer-related and other high-skilled fields (e.g., biotechnology). The fee, like the higher visa cap, expired in October 2003. But, in P.L. 108-447, Congress permanently reauthorized a larger education and training user fee, effective December 2004. It also modified the allocation of the fee to, principally, the National Science Foundation (NSF) and the U.S. Department of Labor (DOL). Most of the fees had gone to the NSF's Computer Science, Engineering, and Mathematics Scholarship program and to the DOL's Technical Skills Training Grant program. The NSF renamed the program for low-income students the Scholarships in Science, Technology, Engineering, and Mathematics to reflect P.L. 108-447's expansion of eligible disciplines. DOL is now utilizing its H-1B training revenue to fund the President's High Growth Job Training Initiative (HGJTI) and Workforce Innovations in Regional Economic Development (WIRED) initiative. HGJTI makes awards to public and private organizations that provide training and related services in 14 DOL-selected sectors which meet at least one of the high-growth criteria specified in P.L. 108-447. The sectors include advanced manufacturing, automotive services, biotechnology, construction, energy, health care, hospitality, information technology, financial services, and geospatial technology. WIRED makes awards to governors on behalf of regions harmed by trade or natural disasters and those dependent on a single industry to help them enhance the competitiveness of their economies in the global marketplace.

Because the H-1B visa cap was reached before the start of FY2006 and FY2007, employers have been urging the Congress to give them greater access to foreign professionals through further changes to the H-1B program. At the same time, supporters of IT workers have asserted that their labor market opportunities and those of IT-enabled workers are now not only being threatened by importing foreign-born professional specialty workers but also by offshore outsourcing.

This report will be updated to reflect program activities funded by the H-1B education and training fee, and examine the labor market situation of IT workers. (For information on immigration's impact on U.S. workers, see CRS Report 95-408, *Immigration: the Effects on Low-Skilled and High-Skilled Native-Born Workers*, by Linda Levine.)

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The economic boom that characterized much of the 1990s was particularly true among companies in information technology (IT) industries (e.g., electronics manufacturing, telecommunications, and software services). The demand for workers with IT skills (e.g., computer systems analysts, computer engineers, computer programmers, and computer support specialists) also was expanding rapidly outside these industries as firms increasingly utilized computer-based technologies.

In response to a perceived shortage of persons with IT skills,[1] the 105th and 106th Congresses were motivated to raise for five years the limit on H-1B visas. (The visa category allows employers to temporarily import alien workers to fill professional specialty occupations.[2]) Congress also initiated a user fee that funded education and training activities of the National Science Foundation (NSF) and the Department of Labor (DOL) to further augment the supply of highly skilled workers and thereby reduce the future reliance of U.S. firms on high-skilled temporary foreign workers.

The 108th Congress came to the intertwined H-1B visa cap and user fee issues in a much-changed economic environment. The economy experienced a recession in 2001, with the labor market subsequently staging a slow recovery. IT workers were especially hard hit both by cyclical and other factors.[3] This was reflected in the number of approved H-1B visas for new admissions falling below the elevated cap from FY2001 through FY2003.

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[1] For information on the debate about the presence of an IT worker shortage, see CRS Report RL30140, *An Information Technology Labor Shortage? Legislation in the 106th Congress*, by Linda Levine.

[2] In the Immigration and Nationality Act of 1990, a professional specialty occupation is defined as one that requires the application of a body of highly specialized knowledge, the attainment of at least a bachelor's degree (or its equivalent), and the possession of a license or other credential to practice the occupation if required.

[3] See, for example, Snigdha Srivastava and Nik Theodore, *America's High Tech Bust*, A Report to the Washington Alliance of Technology Workers, Communications Workers of America, conducted by the Center for Urban Economic Development, University of Illinois at Chicago, Sept. 2004; and Richard Ellis and Lindsay Lowell, *The Outlook in 2003 for Information Technology Workers in the USA*, sponsored by the Alfred P. Sloan Foundation, Commission on Professionals in Science and Technology, and the United Engineering Foundation, Aug. 28, 2003.

On October 1, 2003, however, the reversion of the H-1B visa ceiling from 195,000 to 65,000 meant that employers of workers in professional specialty occupations faced heightened competition for visas. The coincident expiration of the user fee also meant that certain NSF scholarship and DOL training programs ceased operation. Some asserted that the programs were no longer needed because they thought an adequate supply of already qualified workers existed to fill employers' demand for IT and other professional specialty workers. Others countered that this was only a temporary situation reflecting the "jobless recovery," which would end at some point and cause employers to renew their pressure on Congress to raise H-1B visa levels. And, indeed, the delayed rebound in the labor market from the recession that ended in November 2001 occurred at about this time.[4]

With the H-1B visa ceiling being reached even earlier in FY2005 than in FY2004, the 108th Congress responded in late 2004 by keeping the cap at 65,000 but exempting from it up to 20,000 aliens with at least a master's degree from U.S. institutions of higher education. P.L. 108-447 also reimposed and authorized permanently the H-1B user fee for education and training activities.

Despite the latest loosening of the H-1B ceiling, U.S. Citizenship and Immigration Services (USCIS) announced in August 2005 that it had received more than 65,000 H-1B visa petitions. This was the first time the cap was met before a fiscal year (FY2006) began. USCIS subsequently announced that the H-1B visa limit for FY2007 was reached in May 2006. As a consequence, the business community has been urging the Congress to reexamine the H-1B program. IT workers and their supporters contend, however, that IT and IT-enabled jobs are now not only being threatened by the importation of foreign workers with H-1B visas but also by U.S.-based companies outsourcing work offshore. They also assert that the labor market opportunities of native-born professional and technical workers are being harmed by the increased supply of high-skilled foreign-born workers.[5]

This report begins by reviewing the user-fee-funded education and training provisions of the relevant immigration legislation passed in 1998, 2000, and 2004. It then examines the NSF and DOL programs funded through the H-1B education and training user fee. The report closes with an analysis of changes in the labor market conditions faced by IT workers during the 1990s and thereafter.

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[4] CRS Report RL32047, *The "Jobless Recovery" From the 2001 Recession: A Comparison to Earlier Recoveries and Possible Explanations*, by Marc Labonte and Linda Levine.

[5] For information on empirical estimates of immigration's impact on U.S. workers see CRS Report 95-408, *Immigration: the Effects on Low-Skilled and High-Skilled Native-Born Workers*, by Linda Levine.

Legislative Activity

The 105th Congress

Concern about an IT labor shortage culminated during the 1998 congressional debate over raising the ceiling on H-1B visas for skilled temporary alien workers. The 105th Congress chose, in Title IV (the American Competitiveness and Workforce Improvement Act of 1998, ACWIA) of P.L. 105-277 (the FY1999 Omnibus Consolidated and Emergency Supplemental Appropriations Act), to raise the cap from 65,000 on new admissions of nonimmigrant professionals who work in specialty occupations to 115,000 annually in FY1999 and FY2000, and to 107,500 in FY2001.[6]

The legislation also imposed a user fee on employers that filed petitions to bring into the country, to extend the stay of, or to hire from other U.S. employers nonimmigrant professionals from December 1, 1998 through September 30, 2000. The cap, then, relates to visas approved for initial employment of temporary aliens, while the user fee relates to visa petitions for initial and continuing employment of temporary aliens.

The fee of $500 per H-1B visa petition was to be used largely to fund mathematics, engineering, or science education and to fund technical skills training in order to better match the supply of qualified U.S. workers with the nature of employer demand. Most fees deposited into the H-1B Nonimmigrant Petitioner Account were allocated to activities carried out by the NSF and the DOL as follows:

- ACWIA authorized and funded, through 28.2% of the user fees, the Computer Science, Engineering, and Mathematics Scholarships (CSEMS) program to provide awards to low-income, academically talented students enrolled in undergraduate and graduate degree programs.
- The NSF received an additional 8% of all fees, with half going to award merit-reviewed grants under the National Science Foundation Act of 1950 (Section 3(a)(1)) for programs that provide year-round K-12 academic enrichment courses in mathematics, engineering, or science and half going to carry out systemic reform activities in K-12 education under Section 3(a)(1) of the 1950 Act.
- Congress directed that the majority of the user fees (56.3%) go to the DOL to fund a demonstration program under Section 452(c) of the Job Training Partnership Act (JTPA) or under Section 171(b) of the Workforce Investment Act (WIA), which replaced JTPA. The grant program was to provide training in technical skills to both employed and unemployed workers.

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[6] In addition to computer-related jobs, employers in recent years have obtained relatively large numbers of H-1B visas for such occupations as electrical and electronic engineers; accountants and auditors; and college and university faculty.

- DOL was awarded an additional 6% of the user fees to reduce the processing time of visa applications and for enforcement activities.[7]

The 106th Congress

The then-Immigration and Nationalization Service (INS) announced that the increased cap of 115,000 H-1B visas for FY1999 was reached in June 1999. The 115,000 limit for FY2000 was reached even earlier in the year (March 2000).

The 106th Congress responded with passage of the American Competitiveness in the Twenty-First Century Act of 2000 (P.L. 106-313). The act raised the cap on newly approved H-1B visas to 195,000 annually between FY2001 and FY2003 while making additional visas available for FY1999 and FY2000. P.L. 106-313 also exempted from the higher limit on admissions for initial employment aliens temporarily employed by institutions of higher education, nonprofit research organizations, or governmental research organizations. Professional specialty workers seeking extensions or modifications to their initial H-1B employment also no longer count against the cap (i.e., the cap does not apply to continuing employment).

In addition, P.L. 106-313 amended ACWIA's allocation of H-1B fees for education and training programs as follows:

- The share going to NSF's CSEMS program was lowered to 22.0% from 28.2%. The amount of the scholarships was raised from $2,500 to $3,125. In addition, scholarships could be renewed for up to four years.
- The share provided to the NSF for K-12 activities almost doubled (to 15%). The funds were to be expended to carry out a direct or matching grant program to support private-public partnerships in K-12 education and to continue to carry out systemic K-12 reform activities.
- The share going to DOL's Technical Skills Training Grants was lowered slightly to 55.0% from 56.3%. The act stated that although the training did not have to develop skill levels commensurate with a four-year college degree, it did have to prepare workers for a wide range of positions along a career ladder. It mandated that at least 80% of the grants be awarded for training employed and unemployed workers in skills required in high technology, information technology, and biotechnology.[8] No more than 20% of the grants could be awarded to train persons for a single specialty occupation. P.L. 106-313 further directed the Secretary of Labor, in

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[7] The remaining 1.5% went to the Attorney General to reduce the processing time of H-1B petitions and to improve the enumeration of nonimmigrant workers.

[8] As stated in the legislation, these fields included software and communications services, telecommunications, systems installation and integration, computers and communications hardware, advanced manufacturing, health care technology, biotechnology and biomedical research and manufacturing, and innovation services.

consultation with the Secretary of Commerce, to award 75% of the grants (which had a 50% matching requirement) to WIA's local workforce investment boards or consortia of such boards in a region.[9] The remaining 25% of grants (with a 100% matching requirement) were to go to partnerships consisting of at least two businesses or a business-related nonprofit organization that represents more than one business (e.g., trade association).

- The 6% that went to DOL under ACWIA for reducing the processing time of H-1B applications fell to 4%.[10]

Separate legislation (P.L. 106-311) raised the user fee to $1,000 effective December 18, 2000. It extended the life of the fee through September 30, 2003, as well.

The 108th Congress

The subsequent reduced demand for IT workers — a product of the 2001 recession and burst high-tech bubble, among other things — was evident in the number of approved new H-1B visas falling short of the elevated cap in FY2001 through FY2003. Once the limit dropped by two-thirds (from 195,000 to 65,000) on October 1, 2003, however, competition among employers for professional specialty visas intensified. At about the same time, firms began to expand employment as well, marking an end to the "jobless recovery" on a national basis. The visa cap was then reached earlier in each year: February 2004 for FY2004, and October 2004 for FY2005.

The 108th Congress addressed the situation in Title IV (the H-1B Visa Reform Act of 2004) of H.R. 4818, the FY2005 appropriations act (P.L. 108-447). In addition to exempting from the 65,000 cap 20,000 aliens with at least a master's degree from a U.S. postsecondary institution and instituting a $500 fraud-prevention-and-detection fee, the act reauthorized permanently a user fee to fund education and training activities for U.S. students and workers. Specifically, effective December 2004, employers that file petitions to bring into the country, to extend the stay of, or to hire from other U.S. employers nonimmigrant professionals must pay a fee of $1,500 (up from $1,000), except for employers with 25 or fewer full-time equivalent workers employed in the United States who must pay a filing fee one-half as large ($750).

The act also changed the allocation of the user fee among the agencies (effective on the date of enactment, December 2004). It revised — in the case of DOL, substantially — the associated education and training programs of the agencies (effective 90 days after the date of enactment, March 2005). The fee allocation and program changes are as follows:

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[9] Under ACWIA, 100% of the grants went to these bodies.

[10] The Attorney General received the remaining 4% to reduce the processing time of H-1B petitions and to improve the enumeration of nonimmigrant workers.

- The share going to NSF's CSEMS program rose to 30.0% from 22.0%. The value of the scholarships increased substantially (from $3,125 to $10,000). Eligibility for low-income students expanded from those enrolled in programs leading to a degree in mathematics, engineering, or computer science to "mathematics, engineering, computer science, or other technology and science programs designated by the Director."[11] In addition, the NSF Director may now use a maximum of 50% "of such funds for undergraduate programs for curriculum development, professional and workforce development, and to advance technological education. Funds for these other programs may be used for purposes other than scholarships."
- The share provided to the NSF for K-12 activities to carry out a direct or matching grant program to support private-public partnerships in K-12 education and to continue to carry out systemic K-12 reform activities was reduced from 15% to 10%.
- The share going to DOL for training was lowered as well, from 55.0% to 50.0%. Grants are to be awarded to eligible entities to provide job training services and related activities to employed and unemployed workers so they can obtain or upgrade career ladder positions in high-growth industries.[12] Eligible entities are defined as private-public sector partnerships, including businesses or business-related nonprofit organizations (e.g., trade associations), education and training providers (e.g., community colleges and other community-based organizations), entities involved in administering Title I of WIA (e.g., workforce investment boards), and economic development agencies. To facilitate the provision of training services, DOL is allowed to use these funds to assist in developing and implementing model activities (e.g., increasing the integration of community college activities with those of businesses and the public workforce investment system). The Secretary of Labor must ensure the equitable distribution of grants across geographically diverse areas and must, among other things, take into account in awarding grants the extent to which applicants will make available funds from sources other than the user fee (referred to as leveraging). The Secretary may require a matching share of cash or noncash resources.

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[11] Eligible programs include the biological sciences (excluding medicine and other clinical fields), physical sciences, mathematical sciences, computer and information sciences, the geosciences, and engineering as well as technology areas related to these fields of study.

[12] While Congress specified the industries under prior law, P.L. 108-447 states that high-growth sectors are to be determined by the Secretary of Labor in consultation with state workforce investment boards. The act further states theat the criteria for industry selection should take into account such factors as projections of substantial job gains, technological and other innovations that will require development of new skill sets by workers, new and emerging businesses with growth potential, and economic sectors significantly affecting the overall economy or expansion of other industries.

- The 4% that went to DOL under prior law for reducing the processing time of H-1B applications increased slightly to 5%.[13]

Program Activity

NSF

The total amount of fees allocated to the NSF from the Nonimmigrant Petitioner Account under P.L. 105-277 and P.L. 106-313 is shown in **Table 1**. As previously noted, most of the NSF's share of fees has gone to the CSEMS program.

Table 1. H-1B User Fees Allocated to the CSEMS Program and K-12 Activities Pursuant to P.L. 105-277 and P.L. 106-313

Fiscal year	Funding level (in millions of dollars)
2000[a]	$25.06
2001[b]	78.51
2002[c]	57.31
2003	46.57

Source: National Science Foundation.

a. Reflects the CSEMS program and K-12 activities under P.L. 105-277.
b. Reflects the CSEMS program and the changeover to K-12 activities under P.L. 106-313.
c. The NSF anticipated that the funds flowing from P.L. 105-277 would have been fully obligated by the end of FY2002.

In spring 2000, 114 CSEMS awards totaling $22.5 million were announced. In spring 2001, 110 awards totaling $24.3 million were announced, as were 72 supplements (in the amount of $24.0 million) to 2000 awards to extend them from two years to four years. In summer 2001, 77 awards totaling $26.5 million were announced, and in summer 2002, 93 awards totaling $32.0 million were announced.[14] The program made 67 awards in 2003 totaling $25.3 million.[15] An additional 92 awards in the amount of $32.6 million were announced from June through September

[13] The Secretary of Homeland Security, rather than the Attorney General, receives the remaining 5% to reduce the processing time of H-1B petitions and to improve the enumeration of nonimmigrant workers.

[14] Information provided to CRS by NSF, May 18, 2003.

[15] According to the information provided Jan. 29, 2004 to CRS, the 2003 figure includes 10 supplements totaling $225,192 under the Department of Energy (DOE) agreement for students and a few faculty to work in DOE labs.

2004. (These were unobligated funds allocated to NSF from the Nonimmigrant Petitioner Account in late 2003.)[16]

Between FY2000 and FY2004, then, the NSF provided $187.2 million in H-1B user fees to colleges and universities through 553 new awards and 72 supplements in an effort to increase the supply of individuals with skills in computer science, engineering, and math. Some 40,000 students were awarded scholarships over the period. A total of 329 projects remained active in 2005 (i.e., they still had students holding scholarships).[17]

As the NSF receives its share of user fees from the Nonimmigrant Petitioner Account about six to eight weeks after the end of the quarter in which they are collected, it received a small sum in March 2005 and larger amounts later in the year. While waiting for funds from the reauthorized user fee to accumulate, the agency revised its user-fee-funded scholarship program based on P.L. 108-447's modifications, which went into effect in March 2005. Because the legislation expanded the definition of eligible disciplines, the name of the program was changed to NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM). A solicitation for proposals was issued on January 3, 2006, and 113 awards, averaging $490,000 and ranging from 4-5 years, were granted during August and September to institutions of higher education. The total amount dispensed was $55.6 million. Individual scholarships cannot exceed $10,000 annually.

Another program solicitation has been issued more recently. It covers three rounds of competition (February and November 2007, and August 2008) which are expected to produce 90-130 new S-STEM awards. Each award is not expected to exceed $600,000, for a total of $50-$70 million.

DOL

Technical Skills Training Grants. As shown in **Table 2**, the DOL provided 43 grants totaling $95.5 million under ACWIA in 2000. The department awarded another 86 grants totaling about $232.8 million through January 1, 2004 under P.L. 106-313.[18]

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[16] Information provided to CRS by NSF, Oct. 21, 2005.

[17] Ibid.

[18] Beginning with its January 2003 grant solicitation, DOL attempted to take into account modifications to the program contained in P.L. 106-313 and comments made by evaluators, among others. For example, the solicitation emphasized that a goal of the grants was provision of higher than preparatory or entry-level training so that participants would attain skill levels at or approaching those of H-1B workers. (Under prior awards, some sites had provided remedial courses to persons who lacked the background to participate.) The solicitation identified as priorities the provision of higher levels of training in H-1B occupations and in fields referenced in P.L. 106-313. It accorded less of a priority to training in lower-level health care fields and other non-professional specialty occupations. The grant period was lengthened to 36 months, with an additional one-year no-cost extension possible, to allow ample time for participants to complete the higher-level training

(continued...)

Table 2. Awards of Technical Skills Training Grants, 2000-2004

Effective date of grants[a]	Amount of grant (in millions of dollars)	Number of grants
March 31, 2000	$12.3	9
August 1, 2000	29.2	12
November 15, 2000	54.0	22
December 14, 2001	24.4	9
March 15, 2002	23.2	8
May 1, 2002[b]	34.5	14
June 15, 2002	19.1	7
October 1, 2002	17.3	7
December 16, 2002	6.0	2
April 1, 2003	10.3	4
July 1, 2003	14.8	5
October 1, 2003	14.8	5
January 1, 2004	19.4	7
January 1, 2004[b]	49.1	18

Source: U.S. Department of Labor.

a. The 2000 grants were issued while P.L. 105-277 was in effect. Subsequent awards were issued under P.L. 106-313.

b. These grants went to businesses or business partnerships. They were awarded under P.L. 106-313's requirement that these organizations should receive 25% of DOL's share of H-1B user fees devoted to training. All other grants shown in the table were awarded to local workforce investment boards or regional consortia of local boards.

Fifty-four of these grants, in the amount of $149.2 million, went to WIA's local workforce investment boards or consortia of such boards in a region. The other 32 grants, in the amount of $83.6 million, went to partnerships consisting of multiple businesses or business-related nonprofit organizations that represent multiple businesses.[19]

Between March 31, 2000, and January 1, 2004, a total of $328.3 million in Technical Skills Training Grants was awarded. The grants accounted for 75% of the $436.32 million in H-1B funds expected to be allocated to DOL through FY2003 pursuant to P.L. 105-277 and P.L. 106-313.[20]

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[18] (...continued)
being offered.

[19] The business-led partnerships could also include educational, labor, faith-based or community organization, or workforce investment board.

[20] According to DOL, the following sums were allocated to the Technical Skills Training (continued...)

The DOL did not award most of the almost $200 million it expected to issue to local workforce investment boards or regional consortia of boards under the January 2003 solicitation — which it cancelled effective January 16, 2004. As shown in the last row of **Table 2**, it did award virtually all of the approximately $50 million expected to be issued to business partnerships or business-related nonprofit organizations under the June 2003 solicitation. In accordance with the Bush Administration's FY2005 budget request, P.L. 108-447 rescinded $100 million in unobligated funds in the Nonimmigrant Petitioner Account that would have been available to the Secretary of Labor.

Between March 31, 2000 and March 31, 2005, 62 of the 129 grants awarded were completed. Most grants (completed and operational) focus on high-tech/information technology. Out of a total of 86,036 individuals, 27,806 participants were in training and 73,077 participants had completed training as of March 31, 2005.[21]

The President's High Growth Job Training Initiative (HGJTI) and Workforce Innovation in Regional Economic Development (WIRED) Initiative. The DOL began in 2006 to utilize revenues generated by the H-1B visa fee in program years 2005, 2006, and 2007 to fund the HGJTI and WIRED. (The Office of Management and Budget estimated that DOL's quarterly revenue from the H-1B user fee will average $31 million over the FY2005-FY2007 period, or some $124 million annually.) The department indicated that more than 95 cents of every dollar will to be awarded through competitive solicitations. Less than 5% will go toward technical assistance, a full-scale evaluation, and "a limited number of unsolicited proposals to provide new innovative and unique models that strategically complement and enhance current investments."[22]

HGJTI. For some years before funds from the H-1B user fee became available under P.L. 108-447, the President's High Growth Job Training Initiative was supported by the Secretary's general demonstration authority under section 171 of the Workforce Investment Act (WIA).[23] The HGJTI relies upon partnerships comprised of businesses, the public workforce system, education and training providers, and economic development officials to devise solutions to the workforce challenges identified by industry leaders in 14 economic sectors selected by DOL.

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[20] (...continued)
Grant program: $41.38 million in FY1999; $75.59 million in FY2000; $131.49 million in FY200; $90.73 million in FY2002; and $97.13 million in FY2003.

[21] DOL, Employment and Training Administration, *Workforce System Results, Third Quarter PY2004/Second Quarter FY2005*.

[22] Information provided to CRS by DOL, Mar. 22, 2006.

[23] For more information on the HGJTI see CRS Report RL33811, *The President's Demand-Driven Workforce Development Initiatives*, by Ann Lordeman and Linda Levine. (Hereafter cited as CRS Report RL33811, *The President's Demand-Driven Workforce Development Initiatives*.)

Workforce challenges common to the targeted sectors include developing an adequate supply of appropriately educated young workers, expanding postsecondary training alternatives (e.g., developing community college programs), creating strategies to attract new employees and retain incumbent workers, and transitioning workers displaced from declining industries.[24] The sectors that DOL determined meet the initiative's high-growth criteria[25] — which essentially are the same as those in P.L. 108-447 — are:

- advanced manufacturing,
- aerospace,
- automotive services,
- biotechnology,
- construction,
- energy,
- geospatial technology,
- health care,
- homeland security,
- hospitality,
- information technology,
- financial services,
- retail trade, and
- transportation.

In June 2006, the department announced an HGJTI competitive solicitation for the advanced manufacturing sector.[26] Proposed projects had to address one or more of the sector's workforce challenges through training activities that lead to an appropriate credential. Applicants deemed to successfully integrate their activities into state or regional economic development strategies would be awarded bonus points. In October 2006, DOL announced the awarding to 11 groups of $16.8 million in three-year grants. Although P.L. 108-447's user fee is the source of funds for these HGJTI awards, the funding source for recent HGJTI grants in other sectors (e.g., financial services and energy) is unclear.[27]

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[24] Other workforce challenges and additional information on the HGJTI can be found at [http://www.doleta.gov/BRG/JobTrainInitiative].

[25] The criteria are sectors (a) projected to add substantial numbers of new jobs, (b) having a significant impact on the economy, (c) affecting the growth of other industries, (d) being transformed by technology and innovation that requires new skill sets for workers, *or* (e) sectors in which new and emerging business is projected to grow.

[26] "U.S. Department of Labor Announces $10 Million Competition for Advanced Manufacturing Training," *ETA News Release*, June 1, 2006. Note: According to *High Growth Job Training Initiative SGA - Advanced Manufacturing* (SGA/DFA PY 05-07, May 2006, p. 9), advanced manufacturing refers to "the use of technology or other productivity-enhancing business processes in the manufacturing enterprise and/or value-added supply chain. This definition is not synonymous with "high-tech manufacturing," as the emphasis is on the processes used in production and related activities, rather than the output of high-tech products."

[27] For more information on this point see CRS Report RL33811, *The President's Demand-*
(continued...)

WIRED. The Workforce Innovation in Regional Economic Development initiative is designed "for regions that have been affected by global trade, are dependent on a single industry or are recovering from natural disasters."[28] Regions that participate in WIRED reportedly "will be empowered to implement ground-breaking strategies that will result in their workforce investment system becoming a key component of their region's economic development strategy."[29]

Eligible applicants for WIRED grants are state governors. Each must submit an application for a multi-county regional team made up of public and private representatives (e.g., from government, academia, business, and community development).

Although DOL has not clearly articulated the basis for funding the initiative with the H-1B user fee,[30] it issued a competitive solicitation for WIRED in November 2005.[31] Three-year awards to 13 regions, each receiving $15 million for a total of $195 million from user fee revenues, were announced in February 2006. The following month DOL awarded $100,000 for planning grants to each of the governors of the next 13 highest-scoring WIRED proposals, referred to as the "Virtual 14th Region."[32]

A request for proposal to evaluate WIRED was issued in June 2006. Its estimated cost is between $2.7 million and $3.5 million.[33]

In January 2007, DOL announced its intention "to provide up to $65 million to 13 regions across the country that comprise the second generation" of the WIRED initiative (i.e., the regions composing the "Virtual 14th Region).[34] An initial award of $500,000 will go to each of the 13 regions. After completing a regional implementation plan, each region will be able to draw upon $4.5 million over a three-year period.[35]

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[27] (...continued)
Driven Workforce Development Initiatives.

[28] Information provided to CRS by DOL, Mar. 22, 2006.

[29] *WIRED Solicitation for Grant Applications*, SGA/DFA PY-05-04, Nov. 2005, pp. 1-2.

[30] For more information on WIRED see CRS Report RL33811, *The President's Demand-Driven Workforce Development Initiatives*.

[31] "Secretary of Labor Elaine L. Chao Announces $195 Million for President Bush's Competitiveness Agenda," *ETA News Release*, Feb. 1, 2006.

[32] DOL, *WIRED Update*, June 30, 2006.

[33] The proposal can be found at [http://www.doleta.gov/sga/rfp/DOL061RP20079.pdf].

[34] DOL, "U.S. Department of Labor Commits Up to $65 Million for 2nd Generation of WIRED Activities," *ETA News Release*, Jan. 17, 2007, p. 1.

[35] "Labor Department Grants Up to $65 Million to 13 Regions for Job Training, Development," *Daily Labor Report*, Jan. 18, 2007.

Labor Market Conditions for IT Workers

The labor market prospects of IT and many other workers reversed course after the 1990s expansion ended. The data analyzed below show the harsher — albeit generally improving — reality of recent labor market conditions for IT workers.

Employment

Almost 2.5 million persons worked in IT jobs as computer systems analysts, computer engineers, computer scientists and computer programmers in 2000 — more than twice the number in 1989, the prior peak in the business cycle. (See **Table 3**.) Employment in these occupations increased by 121% between 1989 and 2000, which was well above the average increase across all occupations of almost 17%, according to U.S. Bureau of Labor Statistics' (BLS) data.

With the bursting of the dot-com bubble and advent of the 2001 recession, the number of workers in IT occupations dropped sharply (by 18%) between 2000 and 2003. Employment, without regard to occupation, contracted at both high-tech manufacturers (e.g., electronic components and accessories, communications equipment, and computers and office equipment) and high-tech services providers (e.g., communications and software services) as well.[36] In contrast, the total number of jobs lost during the recession was more than recouped by 2003, according to BLS data.

Table 3. Employment in Selected IT Occupations, 1989-2006
(numbers in thousands)

Year	Computer systems analysts, engineers, and scientists	Computer programmers	Total
1989	566	561	1,127
2000	1,797	699	2,496
2003	1,480	563	2,043
2004	1,513	564	2,077
2005	1,577	581	2,158
2006	1,561	562	2,123

Source: U.S. Bureau of Labor Statistics.

Note: The data are derived from the Current Population Survey, a household survey. The occupational classification system was changed beginning with 2003 data, which may not be strictly comparable with prior years' data.

[36] AeA, *Tech Employment Update*, 2003, available at [http://www.aeanet.org].

Overall U.S. employment has continued to grow since it surpassed its pre-recession level in 2003. But employment in IT occupations in 2006 was still well below 2000 levels despite a turnaround that began in 2004. (See **Table 3**.)

In contrast, jobs in high-tech industries continued to be lost between 2003 and 2004.[37] Not until 2005 did employment in high-tech industries start to rise.[38] This trend continued during the first six months of 2006. Although job growth in high-tech industries through mid-year 2006 surpassed the gain recorded over January to June 2005, the rate of increase in the sector lagged that of the private sector overall.[39]

Some expect this weak recovery in IT industries to continue, with "[c]autious hiring by employers and the rapid rise of offshore outsourcing likely [to] mean that hiring by technology companies will remain volatile for the foreseeable future."[40] Annual surveys of hiring managers at IT and non-IT firms commissioned by the Information Technology Association of America (ITAA) similarly show that prospects for a substantial rebound in the employment of workers with computer-related skills remain dim. The ITAA also has identified offshore outsourcing as one contributor to the dramatically changed situation of IT workers in addition to such economy-wide factors as rapid productivity growth and increased health benefit costs.[41] The 2003 ITAA survey of hiring managers showed, for example, that 6% of all firms moved IT jobs to other countries — with the figure doubling among IT companies.[42] (Other sources confirm the growing interest in sending IT and IT-enabled work outside the United States.)[43] Global Insight, in a 2004 study conducted for the ITAA, projected that the economy would create over 500,000 new IT jobs between 2003 and 2008, with about one-half being located offshore.[44] The consulting firm subsequently projected that in 2010, offshore software and IT services outsourcing would create over 337,000 new jobs throughout the economy after accounting for worker displacement due to offshoring in these industries. Those

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[37] AeA, *High-Tech Industry Employment Slowly Turns the Corner,* Apr. 26, 2005.

[38] AeA, "U.S. Tech Industry Adds 190,000 Jobs over 18 Month Span," *The AeA Competitiveness Series*, vol. 3, Sept. 2005.

[39] AeA, "U.S. Tech Industry Adds 140,000 Jobs in First Half of 2006," *The AeA Competitiveness Series*, vol. 12, Sept. 2006.

[40] Snigdha Srivastava and Nik Theodore, *Information Technology Labor Markets: Rebounding, but Slowly*, A Report to the Washington Alliance of Technology Workers, Communications Workers of America, Local 37083, AFL-CIO, by the Center for Urban Economic Development, University of Illinois at Chicago, June 2006.

[41] ITAA, *Adding Value ... Growing Careers: The Employment Outlook in Today's Increasingly Competitive IT Job Market*, Sept. 2004. (Hereafter cited as ITAA, *Adding Value...Growing Careers*.)

[42] ITAA, *2003 IT Workforce Survey*, May 5, 2003.

[43] For additional information see CRS Report RL32292, *Offshoring (a.k.a. Offshore Outsourcing) and Job Insecurity Among U.S. Workers*, by Linda Levine.

[44] ITAA, *Adding Value...Growing Careers*.

sectors projected to experience the most displacement are publishing, software and communications, as well as professional, consulting and business services.[45]

The Economic Policy Institute (EPI) wrote in summer 2005 that "the freefall in IT employment has ceased, and this area is once again growing, though more slowly than overall payrolls."[46] It acknowledged that the demand for IT workers from the mid-1990s until the 2001 recession was partly "inflated by speculation rather than underlying fundamentals." When combined with supply-side conditions — which were marked by a "surplus of IT workers after the tech-bubble burst, along with the ever expanding global supply available through offshoring" — EPI concluded that "it is unlikely that employment levels will soon regain their recent peak."

Unemployment

Between 2000 and 2003, the unemployment rate more than doubled, rising from 2.0% to 5.2%, among computer systems analysts, computer engineers, and computer scientists. (See **Table 4**.) It quadrupled, rising from 1.6% to 6.4%, among computer programmers. Over the same period, all workers in professional and related occupations averaged a much smaller increase (from 1.7% to 3.2%) in their unemployment rate.

More recently, the incidence of unemployment among IT workers markedly improved. As a result, there was virtual equality in the jobless rates of IT workers compared to professional workers, on average, in 2005 and 2006.

Table 4. Unemployment Rates in All Professional Specialty Occupations and in Selected IT Occupations, 1989-2006

Occupation	1989	2000	2003	2004	2005	2006
All professional specialty occupations	1.7	1.7	3.2	2.8	2.4	2.1
Computer systems analysts, engineers, and scientists	1.4	2.0	5.2	3.6	2.7	2.4
Computer programmers	1.6	1.6	6.4	5.8	2.3	2.4

Source: U.S. Bureau of Labor Statistics.

Note: Because of the fairly small number of workers in computer-related occupations, year-to-year changes in their unemployment rates must be several tenths of a percentage point (0.6-0.9) to be considered statistically significant. The occupational classification system was changed beginning with 2003 data, which may not be strictly comparable with prior years' data.

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[45] Global Insight, *Executive Summary: The Comprehensive Impact of Offshore Software and IT Services Outsourcing on the U.S. Economy and the IT Industry*, sponsored by the ITAA, Oct. 2006.

[46] Economic Policy Institute, "The Aftermath of the Tech Bubble," *Job Watch*, Aug. 5, 2005, available at [http://www.epinet.org].