
GREAT JOBS WITHIN OUR REACH

Solving the problem of Washington
state's growing job skills gap

Washington state would gain 160,000 jobs, spread across many sectors of its economy, if it fills its jobs skills gap; generating \$720 million in new state tax revenues annually.

A Joint Report from The Boston Consulting Group
and the Washington Roundtable
Seattle, March 2013

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The Boston Consulting Group (BCG) is a global management consulting firm and the world's leading advisor on business strategy. BCG partners with clients from the private, public, and not-for-profit sectors in all regions to identify their highest-value opportunities, address their most critical challenges, and transform their enterprises. A customized approach combines deep insight into the dynamics of companies and markets with close collaboration at all levels of the client organization. This ensures that our clients achieve sustainable competitive advantage, build more capable organizations, and secure lasting results. Founded in 1963, BCG is a private company with 78 offices in 43 countries. For more information, visit www.bcg.com.

ABOUT THE WASHINGTON ROUNDTABLE

The Washington Roundtable is a not-for-profit, public policy organization comprised of senior executives from Washington's major employers. Since 1983, the Roundtable has worked to create positive change on state policy issues that foster economic growth, generate jobs and improve quality of life for Washingtonians. For more information, visit www.waroundtable.com.

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GREAT JOBS WITHIN OUR REACH: ADDRESSING THE GROWING JOB SKILLS GAP IN WASHINGTON STATE

The gap between the skills needed by employers and those possessed by potential employees poses a significant challenge to the economic health of both our state and our nation.

This job skills gap has received extensive media coverage here in Washington as well as nationally. It has been studied by both public and private research organizations. It has been talked about so frequently for so long that there is a very real threat it will fade from the public's and policymakers' consciousness and become part of the "background noise" of our society.

Yet, employers in Washington state express increasing concerns regarding their ability to find employees with the requisite skills to fill available job openings here. While these concerns are most pronounced in the computer science, engineering and health care professions, their impact is felt by a wide range of companies - large and small - around the state.

Eliminating the job skills gap in Washington would create great opportunities for the citizens of the state. However, because its causes and potential solutions reside across a wide variety of institutions and systems, it will take a collective effort to do so.

The Washington Roundtable engaged The Boston Consulting Group to bring clarity to the job skills gap challenge facing the state so we can help make Washington an even better place to live, work, and raise a family.

AT A GLANCE

- Washington has great jobs available, but it lacks the skilled workers to fill them all.
- There are 25,000 unfilled jobs in Washington as a result of the job skills gap (growing to 50,000 by 2017), 80 percent of which are in high-skill STEM and health care roles.
- If the job skills gap persists, companies could move additional jobs out of state or fill jobs with under-qualified employees, which hurts productivity and constrains growth.
- Eliminating the job skills gap by 2017 could result in 160,000 new jobs in the state and reduce the unemployment rate by up to two percentage points.
- Solving the job skills gap would generate \$720 million in additional state tax revenues and \$80 million in local tax revenues annually; and produce \$350 million in unemployment trust fund savings.
- Eliminating the job skills gap will require a set of key actions: (1) increase capacity and throughput of key programs in higher education; (2) align community college and technical school degree and certification programs with employer needs; (3) enhance student interest and performance in STEM subjects in the K-12 school system; (4) recruit skilled workers from other states; and (5) support international immigration in order to keep jobs here in Washington.

INTRODUCTION

The implications of a persistent job skills gap are significant. Some of the more obvious include a higher unemployment rate; fewer opportunities for Washington citizens as jobs move out of state; lost productivity and competitive disadvantages for Washington companies; less economic activity; and lower tax revenues for all levels of government.

“We are dooming our kids to live in a world where the jobs are knowledge jobs and we aren’t giving them the knowledge to compete.”

– Senior Human Resource Executive,
Communications Sector

A number of studies, both public and private, have attempted to examine and characterize the job skills gap problem in Washington state. This analysis was conducted by The Boston Consulting Group (BCG) for the Washington Roundtable, a non-profit organization of senior executives representing the state’s major employers. It was designed to bring clarity to this critical issue for employers, policymakers and the general public. The study was designed to achieve three primary objectives:

1. To estimate the size of the job skills gap that currently exists for employers in Washington state;
2. To estimate the size of the job skills gap existing across various job clusters and identify future trends regarding these gaps; and
3. To identify the primary drivers of the job skills gap and develop initial public policy recommendations that could help Washington close the gap.

See pages 10-11 for a summary of the methodology and select references used in this study.

THE JOB SKILLS GAP IN WASHINGTON STATE

Not every job opening is the result of a job skills gap. The labor market is not completely efficient, so many job opportunities simply take time to fill – candidates must learn of the opening; applications or resumes must be submitted and reviewed; interviews must be conducted; and offers made and accepted. Even considering the time involved in processing these routine openings, some positions remain open for much longer periods of time as employers struggle to find candidates with the requisite skills. These latter, persistent job openings are the result of the job skills gap.

To separate these two types of job openings and focus on those resulting from the job skills gap, we defined an “acute” skills gap to exist when a company is unable to fill positions that have remained open for three months or more due to a lack of qualified candidates – based on educational, experience and quality requirements – while offering a prevailing market wage. BCG reviewed publicly available employment data and information from a series of recently released reports. Further, BCG analyzed employment data and interviewed senior executives and human resource experts at Washington Roundtable member firms to identify the size of the job skills gap challenge facing these employers. This analysis was then combined to estimate the size and scope of the job skills gap in Washington (see references).

Based on this analysis, we concluded that there are currently approximately 25,000 “acute” unfilled jobs in the state of Washington as a result of the job skills gap. Approximately 80 percent of those openings are in highly skilled STEM (science, technology, engineering and math) disciplines, such as computer science and engineering, and high-demand health care occupations.

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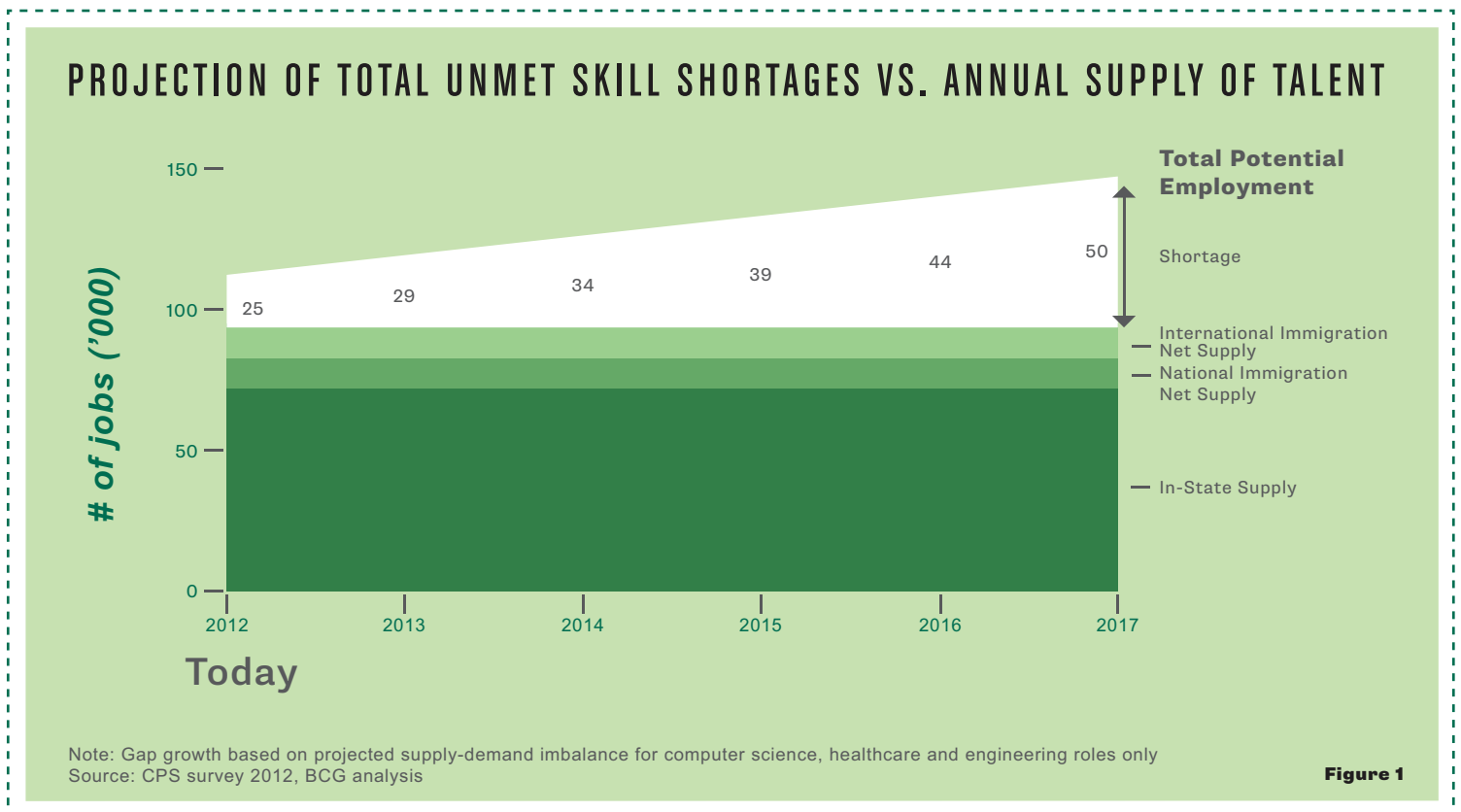
The impact of the job skills gap extends well beyond the significant number of unfilled job openings in the state. Companies will not leave positions open indefinitely; they are sometimes forced to take additional steps. Approximately 40 percent of Washington Roundtable member companies surveyed reported moving positions out of state due to the job skills gap. Additionally, approximately half of the companies surveyed reported that they have hired under-skilled workers for hard-to-fill job openings. These two responses to the job skills gap are not included in this estimate, although their combined impact may exceed that of the persistent job openings.

As illustrated in Figure 1, the job skills gap is very likely to grow in the coming years. Based on historic labor supply and demand data, and assuming that the available job positions remain in the state, the number of “acute” unfilled positions in Washington resulting from the job skills gap is likely to double, to 50,000 jobs, by 2017. The percentage of those openings expected to be in highly skilled STEM disciplines and high-demand health care occupations could increase to 90 percent.

“Our company has been most impacted by the under-skilled workers.”

– Senior Executive,
Financial Services Sector

These job openings will be filled either in Washington state or elsewhere. Public- and private-sector leaders must work together to develop and execute strategies that will result in these job opportunities remaining here, available to Washington citizens and generating economic activity in the state.



ECONOMIC OPPORTUNITIES

By creating more qualified candidates to fill the skills-gap-related job openings, Washington will realize significant benefits, including increased employment, enhanced productivity and economic vitality, and the generation of substantial incremental tax revenues.

Economists agree that high-skill and high-wage jobs, such as computer scientists and engineers, generate a significant “multiplier effect” by creating additional economic activity that results in more job opportunities throughout the economy. Based on conservative multiplier estimates, filling the 50,000 skills gap-related jobs projected to exist by 2017 will result in another 110,000 jobs in Washington state.

Of the 160,000 new jobs that would be created directly and indirectly by filling “acute” skills-related job openings, it is estimated that 40,000 to 60,000 of these workers would come from the ranks of the unemployed in Washington. This hiring could reduce the state’s unemployment rate by 1.2 to 1.8 percentage points.

The economic activity resulting from 160,000 additional jobs statewide would also generate substantial new tax revenues for state and local government. Because a substantial portion of these jobs are likely to be in high-skill, high-wage professions, it is estimated that \$720 million in new state tax revenues and \$80 million in new local tax revenues could be generated annually. This is a conservative estimate, as it includes state and local sales taxes, business and occupation taxes, state property taxes, and other state taxes, but does not include local property taxes, fees or permit income. The figure also does not include the one-time savings of an estimated \$350 million in the state unemployment trust fund due to reduced unemployment; nor does it account for the effect of lower unemployment insurance premiums for Washington state employers.

Finally, Washington would derive two other economic benefits from filling the 50,000 skills gap-related job openings projected to exist in the state by 2017:

- First, eliminating this job skills gap would provide a substantial productivity boost to the state economy. Approximately half of the companies surveyed reported that they place under-skilled workers in persistently open positions, which has an adverse impact on productivity.
- Second, it could help prevent further loss of jobs and corresponding economic activity. Forty percent of companies reported moving positions out of state due to difficulty filling positions.

“There’s no fanfare when this happens. Companies aren’t moving corporate headquarters; they’re just moving growth. There’s no media, no outcry. It just goes. You can’t track it; the companies certainly aren’t going to do media about it, but it is happening.”

– Executive, Technology Sector

A CALL TO ACTION

The facts are clear: employers in Washington have great job opportunities available, but the state lacks the skilled workers to fill them. This gap is estimated at 25,000 jobs today and is projected to double to 50,000 open positions by 2017. Filling the job skills gap by 2017 could result in 160,000 new jobs in the state and reduce the unemployment rate by 1 to 2 percentage points; generate an additional \$720 million in state taxes and an additional \$80 million in local taxes annually; and provide \$350 million in one-time unemployment trust fund savings.

POLICY RECOMMENDATIONS

Thorough analysis of the root causes of the job skills gap makes it clear that effectively addressing this problem in Washington will take the state's public- and private-sector leadership working cooperatively over the next five years to drive changes across a range of public policies and institutional practices. Five strategic steps are summarized below:

1. Increase computer science, engineering and health care capacity and throughput at colleges and universities in Washington

Steps must be taken to improve capacity in computer science, engineering and health degree programs serving Washington students. We cannot afford to continue rejecting two out of three qualified applicants for some high-demand degree programs.

Increasing capacity will require prioritization of existing resources, investment of additional resources to grow these programs, and innovations in service delivery.

Taking these steps has the potential to increase the supply of qualified employees in highly skilled STEM positions by 1,200 to 3,600 per year. The low end of this range is based on the estimated number of qualified applicants denied positions in these programs at the state's three universities with the largest programs in these disciplines, while the top end of the range is based on the estimated number of qualified applicants denied access to these programs at all public four-year universities in Washington and an estimate of increased student interest.

It also could increase the supply of qualified employees in high-demand health care occupations by 400 to 1,400 per year. The low end of this range is based on a 25 percent expansion of clinical placements, while the high end is based on finding spots for all qualified applicants who are denied positions in nursing and medical doctor training programs in the state.

COMPANY PROFILE: CONCUR TECHNOLOGIES

Concur is a Bellevue-based automation software company with strong growth plans for Washington. Concur develops expense-management and business travel automation software.

According to President and COO Rajeev Singh, the company is looking to grow from 600 employees locally to 1,000 by 2016.

To attract the necessary engineering talent, Concur has opened five development centers in the U.S. and across the globe.

While Concur prefers to concentrate its software development talent in Washington, previous difficulty filling local job openings has required the company to become more flexible in locating jobs elsewhere.

The limited number of qualified university graduates requires Concur to recruit out of California universities, driving growth there rather than here in Washington.

As a result, the company estimates that by 2016, 150 new jobs – 30 percent of the new jobs planned for Washington – could end up located elsewhere if talent is not readily available.

Given a conservative estimate of technology industry employment multipliers, this represents a potential loss of 450 new jobs in the Washington economy.

Chairman and CEO Steve Singh says, "It would be ideal to hire the majority of our engineering talent here in Washington where we are headquartered. Increasing our investment in STEM education will drive our local economy."

2. Foster STEM interest and performance among K-12 students

Even after all qualified applicants at Washington colleges and universities have access to their desired degree programs in computer science and engineering, the demand for STEM-related job candidates will continue to exceed the supply. The state cannot fully close the job skills gap in these fields until its K-12 school system produces more high school graduates who are interested in and prepared to pursue these opportunities. As the state economy becomes more technologically driven, it is essential to ensure an adequate pipeline of students moves seamlessly from K-12 into STEM programs throughout the higher education sector.

Creating this pipeline requires all students to have improved access to both foundational and advanced STEM education. This process must begin well before high school, and will require new mechanisms and incentives to attract, develop and retain high-quality teachers in these subjects.

If only an additional 1 percent of public high school graduates became interested and able to pursue a computer science or engineering degree, it is estimated the qualified employee pool would increase by 600 annually. If 5 percent more high school graduates were to have that interest and ability, the impact could be 3,000 more qualified employees each year.

“There’s a whole pipeline issue here. Getting students interested in STEM early requires a pipeline. I believe that the workforce of the 21st Century – whether one goes to college or not – will need better math and science skills.”

– Senior Executive,
Research Sector

3. Improve alignment of technical degree and certificate curricula with employer demands

Washington’s extensive network of community and technical colleges provides conveniently-located and cost-effective educational opportunities for students around the state. However, to help close the state’s existing job skills gap, steps must be taken to ensure that those educational offerings are helping students develop skill sets that employers are demanding.

Additional rewards should be established for community and technical colleges with high program completion, graduation and job placement rates in select high-demand fields. Additionally, the community and technical college system should work to establish additional public-private cooperative programs that combine traditional classroom instruction with practical experiences directly related to the jobs local employers need to fill.

Better alignment could increase the supply of qualified employees available to Washington employers by 800 annually if 25 percent of students currently enrolled in low-demand programs shifted to high-demand programs, while 1,600 additional qualified employees could be created each year if 50 percent of such students made that shift.

“I think we can do a better job of looking at the programs that are being offered and aligning them to where the market is.”

– Senior Executive,
Research Sector

4. Promote and enable in-bound migration of skilled workers from other states

Along with building in-state capacity through the above-mentioned three steps, actions should include promoting the in-bound migration of skilled employees from other states. This would include marketing the state – to those in targeted job categories – as a technology hub and a center of innovation, as well as a great place to live and work.

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Additionally, many small- and medium-sized employers in Washington report difficulty in finding, recruiting, and hiring out-of-state talent for hard-to-fill job openings. The state should engage with these employers to identify effective means to connect and attract out-of-state candidates for skills-gap-related positions with these businesses.

These actions could increase Washington's annual supply of qualified, skilled employees by 2,000 if 4 percent more qualified employees moved into the state and by up to 3,000 per year with a 6-percent increase.

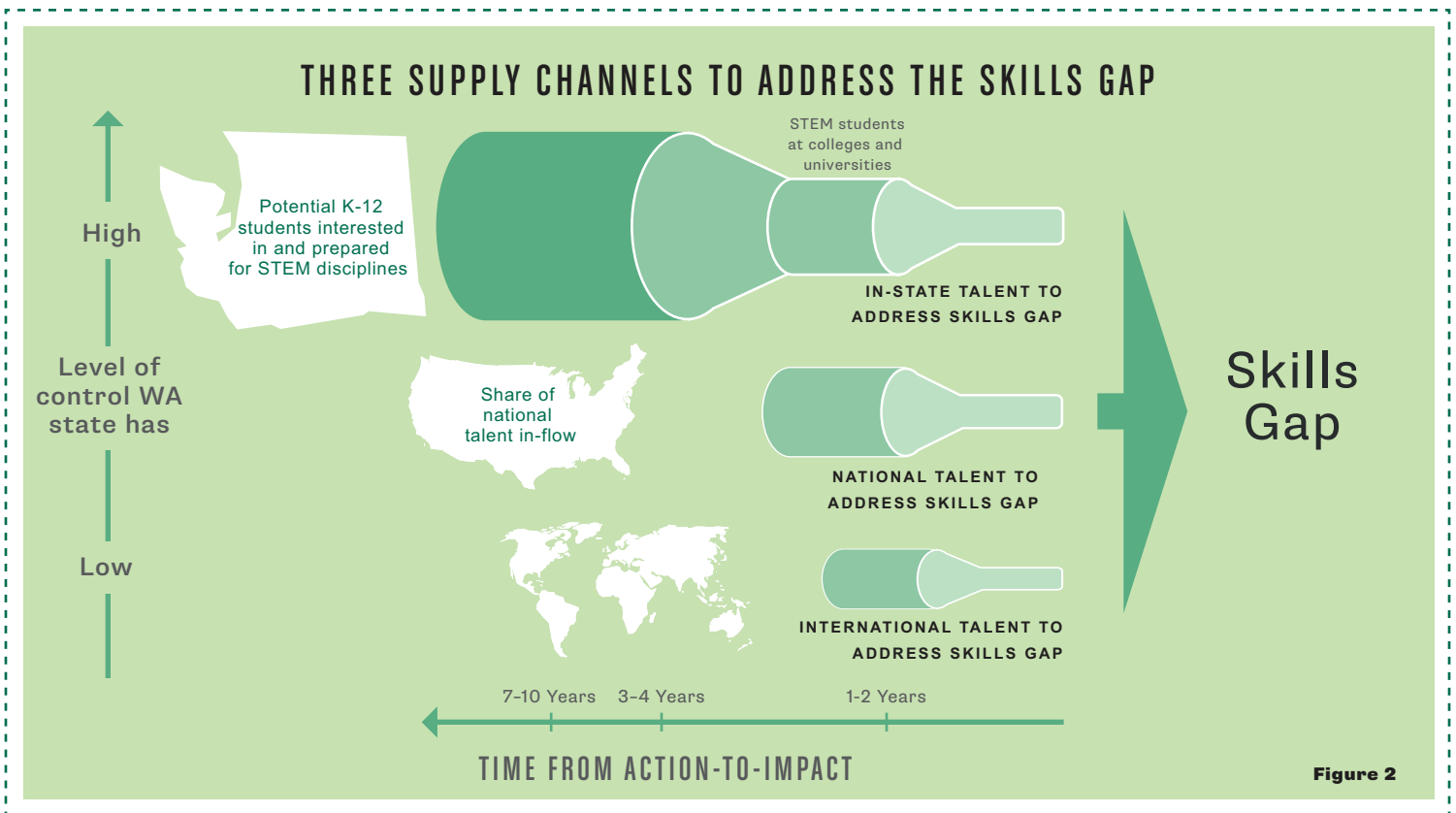
5. Support expansion of international immigration opportunities

Accessing international talent remains a critical strategy along with state strategies to build the capacity to prepare enough skilled workers to close the job skills gap. This is not primarily a state issue, as H1-B visas for high-skilled knowledge workers are controlled at the federal level. However, as one of the nation's

most technology-dependent economies, Washington is more affected than most states by limits placed on this source of talent. Therefore, the state's private and public sector leadership should work with Washington's congressional delegation to encourage substantial increases in the H1-B visa limit.

Because the H1-B visa program is administered at the federal level, it is currently impossible to estimate the potential impact an increase on the allowed number of these visas could have on the job skills gap in Washington. However, a 5 to 10 percent increase in the current annual supply would mean an additional 700 to 1,400 qualified workers temporarily entering the state workforce to fill jobs here Washington.

The labor supply channel has a number of capacity bottlenecks. As a result, the strategies outlined above have varied action-to-impact timelines, as shown in Figure 2.



“If we do nothing, Washington state companies could move additional jobs out of state or fill jobs with under-skilled employees, which hurts productivity and constrains growth.”

– Senior Public Affairs Officer

Overall, at the low end, the estimated impact of implementing these policy recommendations will barely cover the state’s annual skills gap “deficit” – the difference between annual job openings and annual supply of qualified candidates in these high-skill, high-demand fields. This level of improvement will not even begin to address the current “debt” – the shortage of an estimated 25,000 “acute” skills gap-related job openings.

This is an aggressive agenda of recommended actions. Implementing them will take a coordinated effort among public- and private-sector leaders committed to solving Washington’s current and growing job skills gap. It will take a clear mandate to drive meaningful changes across a wide variety of institutions and systems that help prepare potential employees for the workforce. It will require a multi-year commitment and process, with sufficient resources and creative funding mechanisms to support these recommendations. And, importantly, it will require ongoing public monitoring, analysis and documentation of the effectiveness of the effort to close the job skills gap.

Making these tough decisions and aggressively attacking this problem can pay substantial economic benefits: more job opportunities for Washington’s citizens; greater productivity and competitiveness for Washington’s employers; and more tax revenues for Washington’s state and local governments. It is a huge challenge, but also a huge opportunity.

METHODOLOGY AND REFERENCES

Acute Unfilled Positions and Gap Growth

Quantifying the portion of current job openings that remain unfilled due to the job skills gap was a major analytical focus of this study. To develop this estimate, the project drew on publicly available data as well as data from Washington Roundtable member companies.

Starting with the job vacancy data from Washington state’s “2012 Job Vacancy Report,” BCG estimated the percentage of these statewide vacancies that could be characterized as resulting from “acute” shortages. A vacancy was deemed to be “acute” – the result of a job skills gap – when that vacancy remained unfilled for more than three months. Data gathered from Roundtable member companies was used to estimate this proportion for all job types represented by these members. For those job types that were not represented by Roundtable members, such as the health care professions, BCG estimated this “acute” percentage based on the relative statewide unemployment rates in that job type versus the overall state average and the unemployment rates of the high-skill gap job types experienced by Roundtable member companies. When a job type had an unemployment rate above the statewide rate, it was assumed that there were no “acute” vacancies (i.e., there were no job openings due to a job skills gap).

With the size of the current job skills gap established, a different analysis was needed to predict future changes in the size of the job skills gap. For this analysis, BCG examined only computer science, engineering and health care occupations, and only those roles primarily requiring at least a bachelor’s degree. It is in these roles where the gap is most “acute” and for which there are sufficiently robust data to perform an accurate analysis. BCG relied on several sources of public data to model the supply and demand of these high-skill workers and occupations. Because only these occupation types were examined in quantifying the growth of the job skills gap, it is likely that the true gap is larger still.

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For the supply of potential workers, BCG used the Integrated Postsecondary Education Data System, census data and Washington's own job skills gap analysis, "A Skilled and Educated Workforce 2011 Update." The demand for different occupations relied heavily on "Washington Occupation Employment Projections May 2011" published by the Washington Employment Security Department. For any given year, the growth of the job skills gap is equal to the difference between the expected supply of workers for a given occupation and the predicted demand for that occupation.

Tax Impact

BCG used the October 2012 Washington Research Council Economic Profile entitled "Washington's Prosperity Depends on Vibrant Tech Sector" to understand how the Washington state tax structure is impacted by science and technology jobs. The Research Council report quantifies the impact of technology sector job creation on state Business & Occupation (B&O) taxes as well as on state and local sales taxes. These tax impacts were scaled up to include other sources of state tax revenue. Finally, the tax impact of non-tech jobs (i.e., health care and "other positions") were calculated by scaling the tax impact of a tech job downward based on the relative average salaries of these positions.

Job Creation and Unemployment Effect

Fully capturing the total (direct, indirect and induced) job creation impact that can be expected from filling skills gap positions requires a perspective on the corresponding "multiplier effect" that can be expected from jobs across industries. For example, a multiplier of "four" implies that for every new job in an industry, three additional jobs are created across the supply chain and the broader state economy. BCG conducted an extensive literature search to understand the multiplier effect of job creation across different industries, and those academic reports that best reflected Washington state were utilized. Based on this analysis, the following job multipliers were assigned:

- **Computer Science:** 4.6
- **Engineering:** 4.0
- **Healthcare:** 1.7
- **Other positions:** 2.7 (A weighted average)

In order to understand the impact that closing the job skills gap could have on the Washington state unemployment rate, BCG first identified the portion of indirect and induced employment that would be created outside of the "skills gap" sector. For example, if filling a single "skills gap" position in the engineering field creates one new engineering job in the supply chain and two additional new jobs in the broader economy, such as the retail and service sectors, it was assumed that only the two jobs created outside of engineering – and therefore not subject to the job skills gap – could be filled by the current pool of unemployed Washington residents. It was further assumed that only 50 to 75 percent of the jobs created in the broader economy would be filled by the currently unemployed, therefore mitigating the impact on the state's unemployment rate. As with most assumptions and estimates in this analysis, this was a conservative estimate.

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