GENDER EQUITY

IN COLORADO'S STEM INDUSTRIES:

THE CASE FOR FOCUSED WORKFORCE INVESTMENT

Prepared by KP Advisors

THE WOMEN'S FOUNDATION OF COLORADO

The Women's Foundation of Colorado would like to thank the members of our STEM Coalition for sharing our commitment to improving gender equity in the STEM workforce and for making this report possible.

- **Arrow Electronics,** co-chair
- **CH2M**
- **Goodbee & Associates**
- **Lockheed Martin**
- **MWH, now part of Stantec,** founding co-chair
- **QEP Resources**
- **SSG MEP**
- **Stephanie Copeland**
- **Suncor**
- **Zayo Group**

YOU CAN FIND THIS REPORT ONLINE AT: WWW.WFCO.ORG/STEM

WOMEN MAKE UP

46%

OF THE TOTAL COLORADO WORKFORCE, YET THEY ARE LESS THAN A THIRD OF ALL STEM WORKERS IN COLORADO

(IWPR, 2015).

Executive Summary

Colorado companies are ideally positioned to take advantage of the rapid growth in science, technology, engineering, and math (STEM) industries across the nation. Colorado ranks among the top ten states in the country for the percentage of STEM-related jobs as compared to all jobs (Koebell, 2015) and one of the top two states for the most entry-level STEM jobs (Burning Glass, 2013). While the demand for STEM talent grows, the supply of STEM graduates is not keeping pace with the needs of companies. Throughout much of the STEM workforce, women are notably underrepresented, especially in engineering and computing, which comprise more than 80 percent of STEM jobs (Corbett & Hill, 2015).

STEM-RELATED OCCUPATIONS ARE PROJECTED TO GROW

2X

FASTER THAN NON-STEM

(ESA, 2011).

Developing effective STEM programs in Colorado's K-12 schools and institutions of higher education is essential to increasing the representation of women in STEM industries. Building inclusive companies and industries where all can thrive and innovate for the future is equally important. Colorado companies simply cannot afford to fail to attract women into the STEM workforce. Moreover, STEM industries urgently need to make changes to stop the loss of female talent that enter and then leave the STEM workplace. Half of women technologists drop out of the workforce between entry and executive level (Anita Borg Institute, 2013). And over half of the women in science, engineering, and technology, who leave their jobs use their technical training in other sectors, and a third go to work in a non-STEM job (Hewlett, Luce, Sherbin, 2008). Keeping women in the STEM workforce will require companies to offer a flexible, positive work environment with competitive pay and benefits, and opportunities for promotion.

At The Women's Foundation of Colorado we have witnessed the slow progress that has been made in these fields and have been working with Colorado STEM companies to learn more about challenges and opportunities to growing a more diverse STEM workforce. In the full report, *Gender Equity in Colorado's STEM Industries: The Case for Focused Workforce Investment,* you can learn more about the current state of the STEM workforce in Colorado and the benefits of diverse workforces. Drawing from a body of established research, the report suggests concrete steps that STEM industries, companies, and individuals can take to make a lasting impact on the equity and inclusion of women in Colorado's STEM industries.

THE DIVERSITY ADVANTAGE

A wealth of research over the past decade consistently demonstrate that companies often experience the following advantages and benefits when they hire and retain a more diverse and inclusive workforce: (Catalyst, 2013 and Anita Borg Institute, 2013)

- **Improved Operational and Financial Performance:** Better financial performance, higher return on equity, higher return on invested capital, performance that outperforms industry averages, improved corporate sustainability, and increased productivity
- **Reflecting the Marketplace and Enhanced Company Reputation:** Better corporate governance, better corporate oversight, higher likelihood of being considered ethical, and higher customer satisfaction
- **Increased Innovation and Group Performance:** Better problem solving abilities, increased creativity, increased innovation, and increased knowledge formation and patents
- **Leveraged Talent:** Higher employee satisfaction, decreased turnover, and increased percentage of women in line positions

Women's experiences must be a larger part of science, engineering, math, and technology work if we are to solve today's challenges and design the best future products possible. The low numbers of women in tech-intensive industries underscore the work that remains to be done, and the required change to increase the trajectory of women in STEM. The field must do more to leverage its highly qualified female workforce.

While there have been significant gains in the proportion of women who work in the biological sciences, there has actually been a decline in the proportion of women who work in the computing field over the last twenty-five years, and only slight gains in the proportion of women in engineering occupations.

-NSF, Science & Engineering Indicators

BARRIERS FOR WOMEN IN THE STEM WORKFORCE

Women are making significant contributions within STEM fields yet they are a distinct minority in these industries. While the low number of women graduating with engineering and computing science degrees has an influence on the number of women who are available to hire, it is not the only factor affecting a company's ability to recruit and retain women in STEM jobs. Recent research on why some women leave the engineering workforce and others stay indicates that the important variable is more often in the workplace, not the individual.

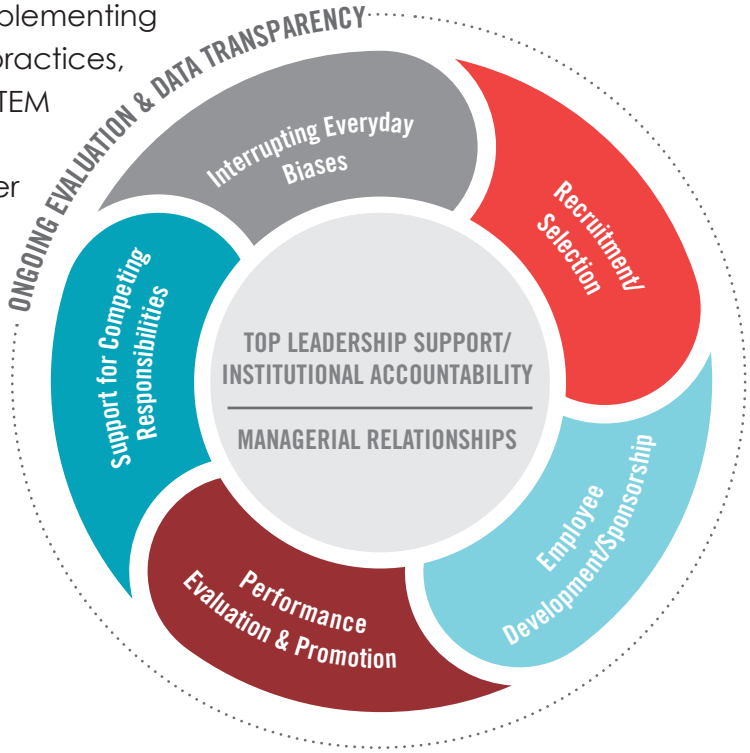
For women to be fully integrated into these fields a change in the environment is necessary. The subtle, and unspoken bias, or unconscious bias in the workplace, creates barriers for women to fully contribute their ideas and leadership, and leads to exclusion. The unconscious biases that we all hold influence our behaviors and actions. Dissimilarity in terms of gender, race, and other areas and unconscious biases can result in lower levels of supervisor support and relationship quality; unclear or unfair promotion processes; and lesser access to professional development, social networks, and important committees.

Addressing the challenges of women in the STEM workforce requires workplace environments that provide flexibility and promote healthy work-life balance. Key components of a healthier work environment for women and men include manageable workloads and expectations that do not promote excessive hours on a routine basis, flexible work schedules, paid parental leave, and telecommuting. These types of workplaces are essential to attracting and retaining the best talent, especially given the increase in dual-career families – in fact, Millennials are twice as likely to have a spouse/partner working than Boomers. People across generations report work-life challenges and a desire for greater flexibility (EY, 2014).

In an economy that is increasingly dependent on science and technology, the STEM-educated professional has a range of career options. Professionals in STEM industries may find employment outside of the STEM workplace for various reasons. The competitive talent marketplace underscores the importance of STEM industries working hard to attract and retain women.

PATHWAYS TO GENDER EQUITY AND INCLUSION IN STEM WORKFORCES

Colorado companies that are committed to having more women in leadership and throughout the ranks can consider implementing the following changes in organizational policies and practices, and review The Women's Foundation of Colorado's STEM Resource Guide to find a wealth of resources about STEM and women in the workforce. The National Center for Women and Information Technology (NCWIT) presents an ecosystem approach to achieving meaningful changes inside companies that are committed to gender equity and inclusion.



At the core of NCWIT's model are three foundational steps to create more equitable workplaces:

1 Establish top leadership support and institutional accountability

Top-level leaders need to make a long-term commitment to developing an inclusive workplace. There is no one solution that will work for all organizations. Companies need to engage in multi-pronged efforts that address systems and individual levels in recruiting, retaining, and advancing women in the workforce. Women leaders on the executive team and on boards can have a significant, positive impact on gender diversity throughout all levels of the company, and in STEM fields as a whole.

2 Educate managers and improve managerial relationships

The managerial relationship is one of the most critical elements affecting gender equity and inclusion efforts in a workplace. Women who left a STEM workplace were less likely to report support from a manager, opportunities for development, and support for work-life balance. Focus on the education and training of managers to be inclusive leaders. Assess the company's supervisory relationships, performance criteria, and promotion policies and practices for inclusivity and unconscious bias. Well-defined performance evaluations that are gender neutral, clear paths toward advancement, and strong supervisory relationships are important factors to retaining highly qualified women.

3 Ongoing data collection and transparency (Ashcraft et. al., 2016)

Companies that want to make progress must first work to understand the current situation and collect data regarding their own gender diversity and inclusion. After establishing a baseline with data, set tangible outcomes, hold individuals accountable, and monitor progress. Use data as an ongoing feedback mechanism, and consider how to do things differently in order to get the results you desire. Seek out best practices, and share your successes and learning points with the field. Learn from your peers and know where you stand in regards to gender equity and inclusion relative to others in your field.

There has never been a better time to work together to advance gender equity and inclusion in Colorado's STEM workforces. Our economy is strong and STEM industries are growing. But not everyone in Colorado is able to take advantage of our abundance, and we are not yet experiencing the benefits that thousands of women can bring as STEM leaders and employees. The Women's Foundation of Colorado and our STEM Coalition are excited to work with companies and industries throughout the state to help us all get on – and stay on – the path to ensuring that everyone in our state has the opportunity to be an active part of Colorado's future growth.

WFCO's STEM Employers Resource List provides more information and is available in the full report and at **www.wfco.org/STEM.**

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Developing effective STEM programs in Colorado's K-12 schools and institutions of higher education is essential to increasing the representation of women in STEM industries. Building inclusive companies and industries where all can thrive and innovate for the future is equally important. Colorado companies simply cannot afford to fail to attract women into the STEM workforce. Moreover, STEM industries urgently need to make changes to stop the loss of female talent that enter and then leave the STEM workplace.

Half of women technologists drop out of the workforce between entry and executive level (Anita Borg Institute, 2013). And over half of the women in science, engineering, and technology who leave their jobs use their technical training in other sectors, and a third go to work in a non-STEM job (Hewlett, Luce, Sherbin, 2008). Keeping women in the STEM workforce will require companies to offer a flexible, positive work environment with competitive pay and benefits, and opportunities for promotion.

At The Women's Foundation of Colorado we have witnessed the slow progress that has been made in these fields and have been working with Colorado STEM companies to learn more about what the challenges and opportunities are to growing a more diverse STEM workforce. In this report we will address the current state of the STEM workforce in Colorado and review the benefits of diverse workforces. Drawing from a body of established research, we will also suggest concrete steps that STEM industries, companies, and individuals can take to make a lasting impact on the equity and inclusion of women in Colorado's STEM industries.

THE DIVERSITY ADVANTAGE

A wealth of research over the past decade consistently finds that businesses benefit financially and in other ways when women and other underrepresented groups are full contributors and leaders in the workplace. Studies have been done to understand the impact of diversity on Fortune 500 companies, top U.S. and global firms, representative business samples, tech entrepreneurship, U.S. patents, and more. The effects of gender and/or ethnic diversity have been evaluated in relation to finances, innovation, performance, market growth, and company reputation. The research findings demonstrate that companies often experience the following advantages and benefits when they hire and retain a more diverse and inclusive workforce: (Catalyst, 2013 and Anita Borg Institute, 2013)

- **Improved Operational and Financial Performance:** Better financial performance, higher return on equity, higher return on invested capital, performance that outperforms industry averages, improved corporate sustainability, and increased productivity
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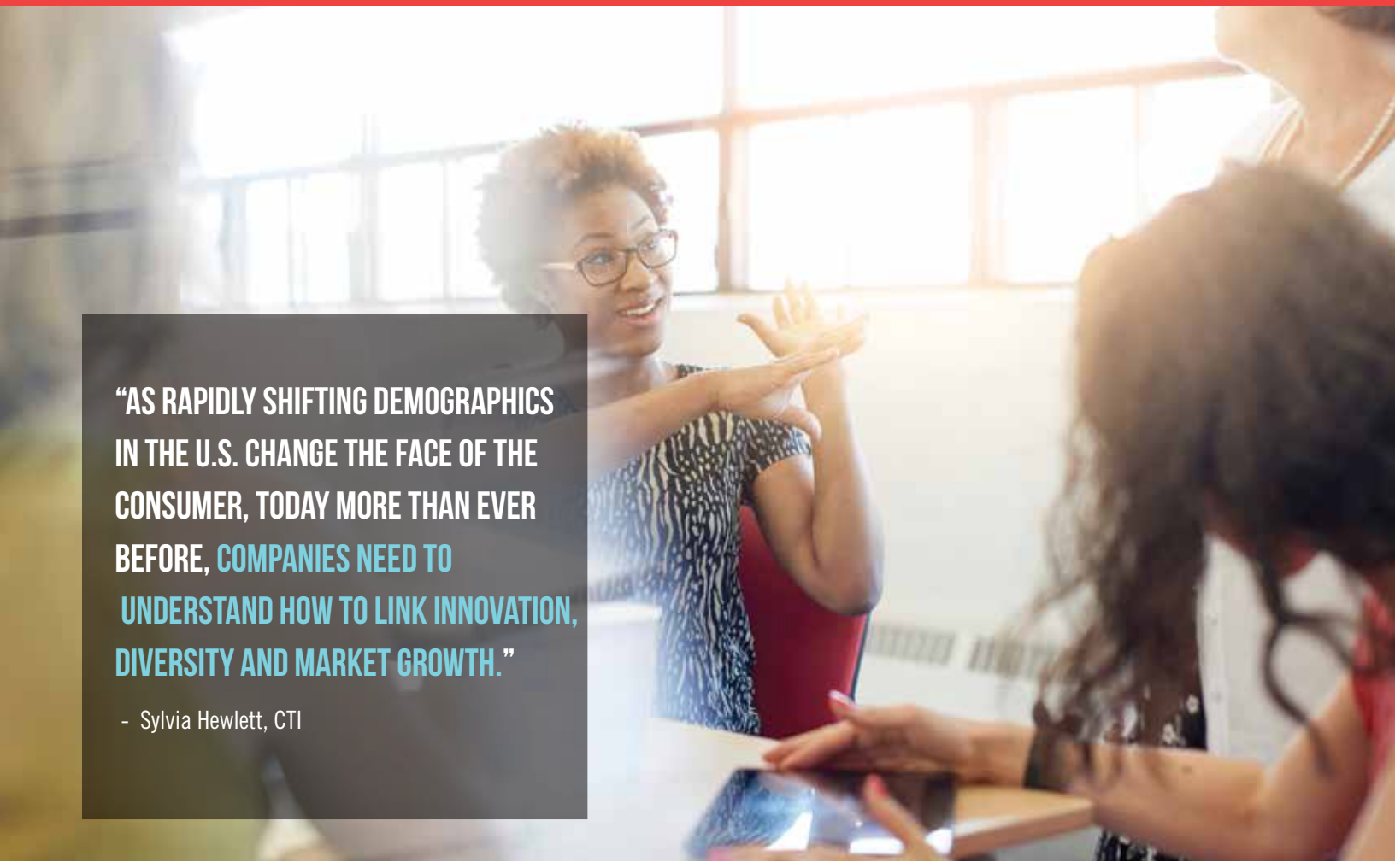
Gender-diverse boards also have a proven positive impact on different measures of financial performance (measured as return on sales, return on invested capital, and/or return on equity), especially when they include a critical mass of women (defined as three or more women directors based on average board size, or 30 percent) (Catalyst, 2013). Female board members have a positive influence on accounting performance and market performance, and their membership is associated with an increase in women executives and in line positions often necessary for advancement in companies. "The presence of women on a company's board sends an important message to employees and other stakeholders: women are valued leaders who contribute to the company's success" (Catalyst, 2013).

According to the McKinsey report *Diversity Matters*, companies with a more diverse leadership team (defined as a greater share of women and a more mixed ethnic/racial composition in the executive team and board) have better financial performance (Hunt et al, 2015). The competitive advantage of diverse leadership teams is attributed to the enhanced ability to win top talent, strengthen customer orientation, increase employee satisfaction, improve decision-making, and enhance the company's image. Companies whose leadership teams are in the top quartile for racial and gender diversity in leadership are more likely to have financial returns above their national industry median, and companies in the bottom quartile are less likely to achieve above average returns. The higher rate of women (22 percent) at senior management levels results in better organizational and financial performance. "This correlation does not prove that the relationship is causal – that greater gender and ethnic diversity in corporate leadership automatically translates into more profit – but rather indicates that companies that commit to diverse leadership

are more successful" (Hunt et al, 2015). A 2010 global survey of a broad cross-section of business executives reveals that 72 percent of respondents believe there is a direct connection between a company's gender diversity and its financial success (McKinsey, 2013).

Diverse teams outperform homogenous teams: a diverse team working together and contributing a range of perspectives has superior outcomes. The presence of women and people of color on a leadership team enhances decision-making by adding perspectives from their different experiences (Hunt et al, 2015). Paul Block, CEO of U.S. sweetener manufacturer Merisant commented on the business imperative of diversity, "People with different lifestyles and different backgrounds challenge each other more. Diversity creates dissent, and you need that. Without it, you're not going to get any deep inquiry or breakthroughs" (Grysberg & Connolly, 2013). Data from one hundred studies on gender and tech entrepreneurship, and an analysis of women's participation in IT patents, conclude that gender diversity results in better innovation. Mixed gender teams were 30-40 percent higher than the norm for the number of patents from teams of similar age and type (ABI, 2013). And, companies with organizational leaders who practice inclusive behavior with a diverse workforce result in greater innovative capacity and market growth (measured by market share and capturing a new market) (Hewlett et al., 2013). Having more women on teams is also associated with increased collective intelligence, and improvements in communication and teamwork.



"AS RAPIDLY SHIFTING DEMOGRAPHICS IN THE U.S. CHANGE THE FACE OF THE CONSUMER, TODAY MORE THAN EVER BEFORE, COMPANIES NEED TO UNDERSTAND HOW TO LINK INNOVATION, DIVERSITY AND MARKET GROWTH."

- Sylvia Hewlett, CTI

The benefits of a gender diverse and inclusive workplace are clear: leveraging talent, enhancing creativity and problem solving, improving market position and company reputation, and a stronger bottom line. Women's experiences must be a larger part of science, engineering, math, and technology work if we are to solve today's challenges and design the best future products possible. The field must do more to leverage its highly qualified female workforce.

> **"Regardless of the role or department or specific job, the mix of the genders always produces a better result - whether it is a group of women in accounts payable or a group of men in drilling."**
>
> – Vice President, Human Resources, at a Colorado-based oil and gas company

COLORADO'S STEM WORKFORCE

The STEM workforce is integral to the vitality of Colorado's economy and global competitiveness. Across the United States, employment in STEM-related occupations is projected to grow two times faster over the next decade than the average of non-STEM occupations (ESA, 2011). For each new four-year graduate there are 2.5 entry-level job postings in STEM fields compared to 1.1 postings in non-STEM fields. (Burning Glass, 2013) Colorado's fastest growing "top jobs," with high job openings and family-supporting wages, include information technology, construction, oil, gas, and mining, healthcare, and business and finance, many of which require skills in STEM (CWDC, 2014). Not only are STEM professionals in high demand, these jobs pay nearly double ($86,000) compared with an average salary ($47,000) across all occupations and levels of educational attainment (Koebel, 2015, and Rothwell, 2013).

In a national ranking of the best cities for graduates with STEM degrees based on size of the STEM industry, salary and median rent, Colorado cities across the Front Range rank in the top 25: Boulder (no. 3), Fort Collins-Loveland (no. 18), Denver-Aurora-Broomfield (no. 19), and Colorado Springs (no. 22) (Jasthi, 2015).

COLORADO'S TECHNOLOGY SECTOR:

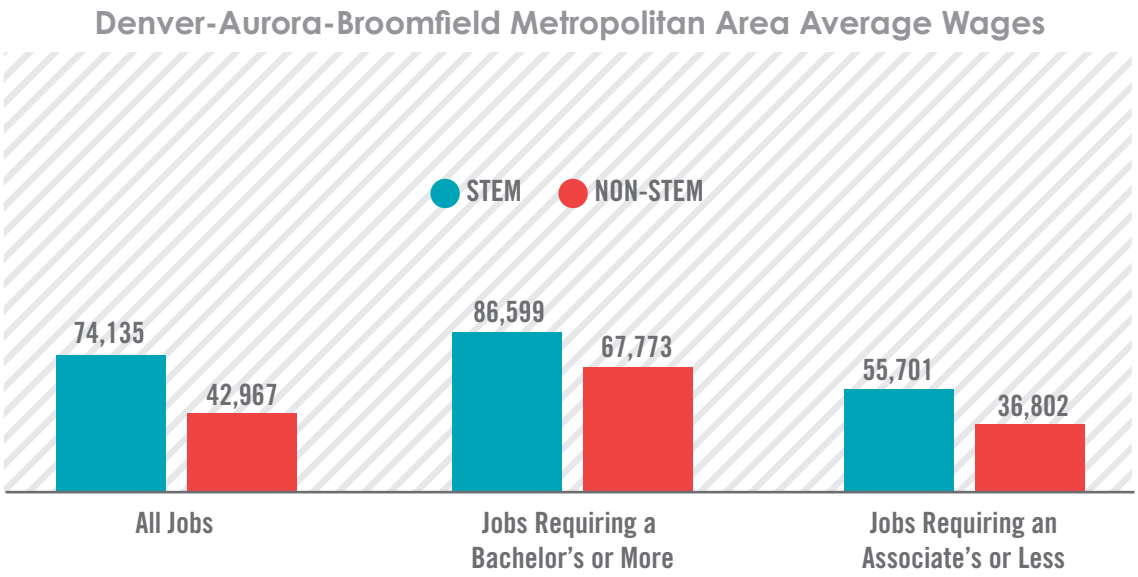
12% of Colorado companies are in the information technology sector (Hess et al., 2013)

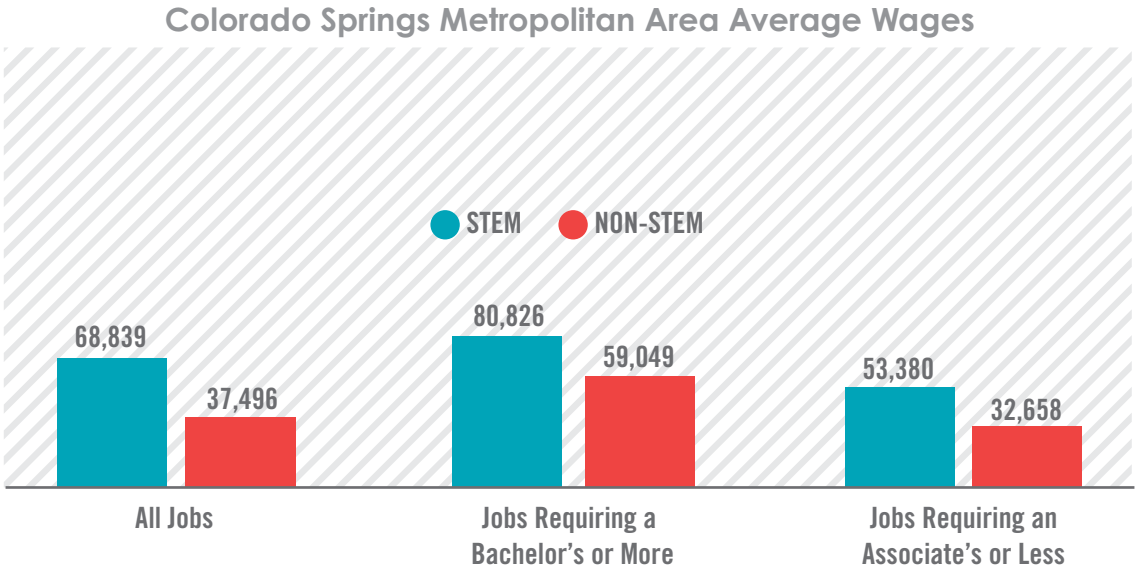
Technology sector contributed **11.5%** to Colorado's gross-state product, and had a 14% increase in job postings in 2015

– Colorado Technology Association

7 of the 10 largest STEM occupations are computer-related (Koebell, 2015)

AVERAGE STEM AND NON-STEM WAGES IN MAJOR METROPOLITAN AREAS, 2013 (ROTHWELL, 2013)





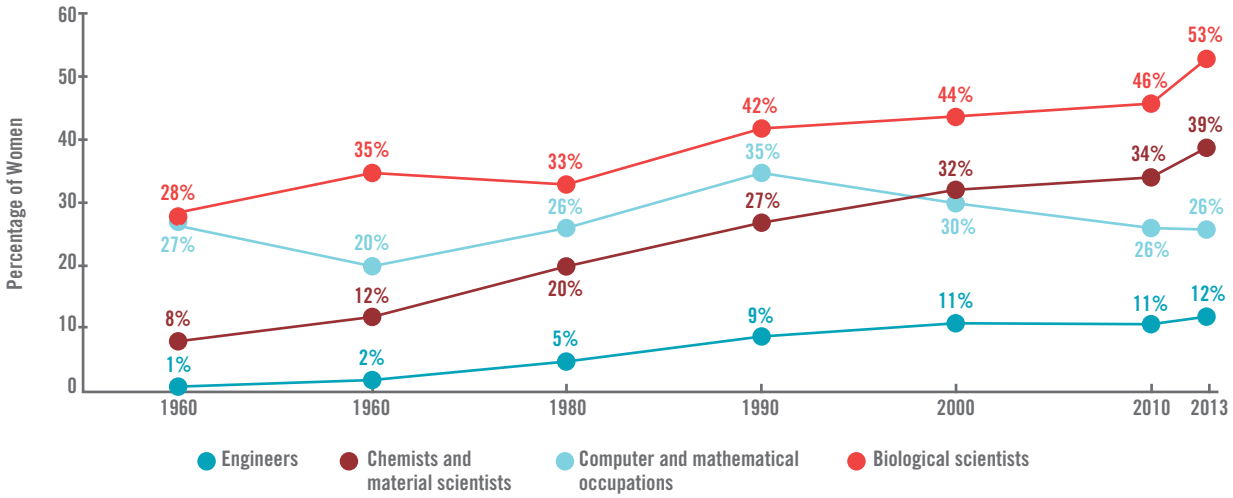
Yet women in Colorado are much less likely than men to be employed in STEM occupations. In fact, men in Colorado are more than twice as likely to work in STEM occupations (IWPR, 2015). Women make up 46 percent of the total Colorado workforce, but they are less than a third of all STEM workers in Colorado. Comparatively, women make up 44 percent of the STEM workforce in the District of Colombia, the area of the country with the highest proportion of women employed in STEM fields (IWPR, 2015).

WOMEN IN THE STEM WORKFORCE

In recent years, women have experienced advancements in male-dominated professions such as law and finance. However, in science, technology, engineering, and math, progress for women has been slow in both post-secondary education and the workplace. Additionally, a deeper look into the aggregate statistics of women in the STEM workplace reveal the considerable variation among the disciplines that comprise STEM fields. While there have been significant gains in the proportion of women who work in the biological sciences (e.g. medicine), there has actually been a decline in the proportion of women who work in the computing field over the last 25 years. In this rapidly growing field, relatively more men than women went into these occupations, resulting in a decline in the proportion of women from 35 percent of the computing field in the 1990s to 26 percent in 2013. During the same period, the proportion of women in engineering jobs increased only slightly from 9 percent to 12 percent (NSF, 2015, and Corbet & Hill, 2015). This proportional gender gap in engineering and computing reflects differences in educational gains as well as factors in the transition to the workplace. This is especially troubling given that engineering and computer jobs account for more than 80 percent of the STEM workforce, and offer a better return on the educational investment and more job prospects than other STEM fields (Corbett & Hill, 2015).

The acronym STEM refers to science, technology, engineering, and math–however, there is no standard definition for what constitutes a STEM job. Science, technology, engineering, and math positions consistently make the lists of STEM occupations, but there is less consensus about whether to include other positions such as educators, managers, technicians, healthcare professionals or social scientists. The Economic and Statistics Administration (ESA) divides STEM occupations into four categories: computer and math (46 percent of all STEM occupations), engineering and surveying (30 percent), physical and life sciences (14 percent), and STEM managerial occupations (9 percent) (ESA, 2011).

FIGURE 1. WOMEN IN SELECTED STEM OCCUPATIONS, 1960-2013

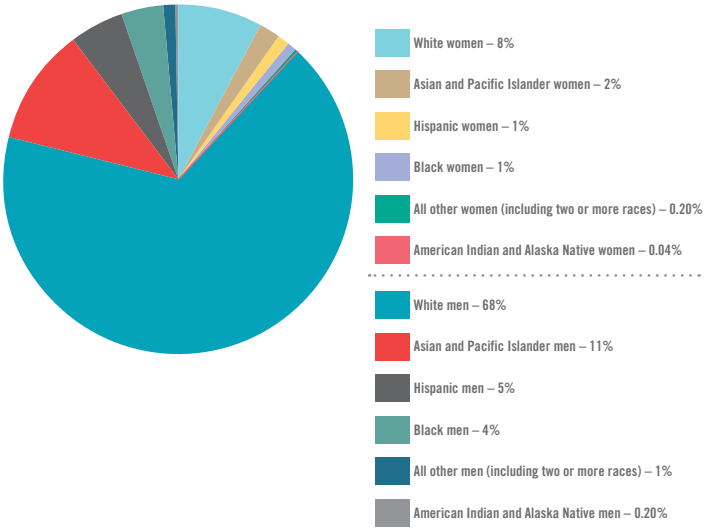


Notes: Postsecondary teachers are not included. For biological scientists in the 1980 and 1990 censuses, data include life scientists as well as biological scientists. For chemical and materials scientists in the 1960 and 1970 censuses, the category was titled "chemists"; in the 1980 and 1990 censuses, the category was titled "chemists except biochemists." For computer and mathematical occupations in the 1960 census, no category for computer scientists was included; in the 1970 census, the category was titled "mathematicians and computer specialists"; and in the 1980, 1990, and 2000 censuses, the category was titled "mathematical and computer scientists."

Sources: AAUW analysis of data from the U.S. Census Bureau (1960, 1970, 1980, 1990, 2000); L. M. Frehill analysis of data from U.S. Department of Labor, Bureau of Labor Statistics (2011, 2014b).

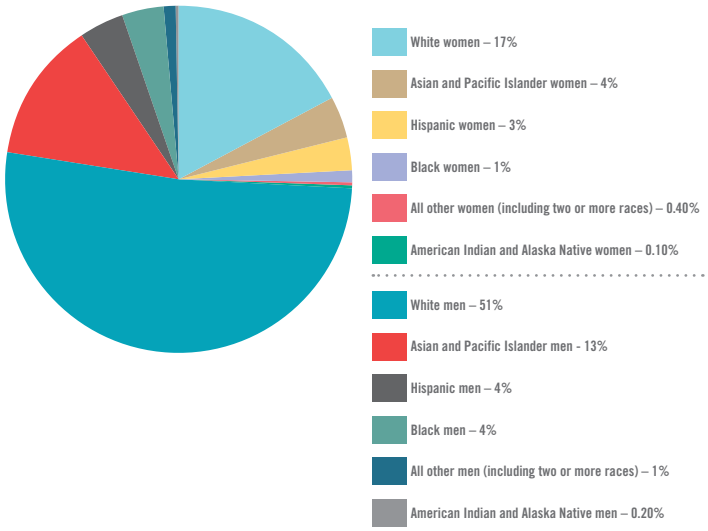
Engineering and computing workplace disparities are even greater for women of color. Figure 2 shows that, in recent years, white women have made up 8 percent, Asian and Pacific Islander women have made up 2 percent, and black and Latina women have each made up 1 percent of the U.S. engineering workforce. Figure 3 illustrates that in computing, white women were 17 percent of the workforce, Asian and Pacific Islander women were 4 percent, black women were 3 percent, and Hispanic women were just 1 percent of the workforce (Corbet & Hill, 2015).

FIGURE 2. ENGINEERING WORKFORCE, BY GENDER AND RACE/ETHNICITY, 2006-2010



Source: AAUW analysis of U.S. Census Bureau (2011a).

FIGURE 3. COMPUTING WORKFORCE, BY GENDER AND RACE/ETHNICITY, 2006-2010



Source: AAUW analysis of U.S. Census Bureau (2011a).

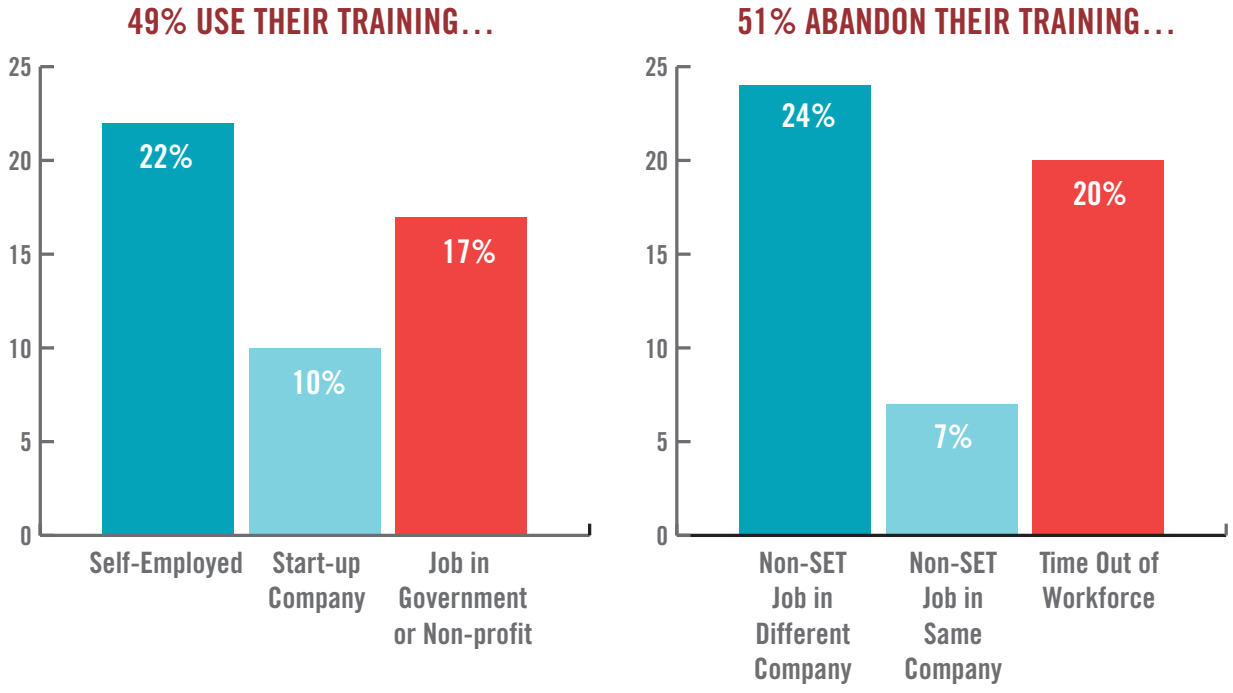
RETENTION

Once women are on the STEM career path, they do not earn as much as or stay in these careers as long as their male counterparts. Women are less likely than their male peers to select their first job in a STEM workplace and are more likely to leave the STEM workplace than both their male peers and women in other occupations. In computing, women leave at twice the rate of their male peers (NCWIT, 2015) and one in four women leave engineering compared to one in ten men (SWE, 2012). Women with science and engineering degrees who work full-time earn less than their male counterparts.

Most of these high potential career women remain in the workforce after leaving STEM industries, but in a different capacity. For example, in a study of women in science, engineering, and technology (SET) occupations, 80 percent of the women report "loving their work" (Hewlett, 2014), yet 52 percent of women in SET occupations leave mid-career (Hewlett, Luce, Sherbin, 2008). Of those women who leave, about half use their technical training in other capacities, and half go on to take other non-SET positions (Hewlett, 2008). Figure 4 from the NCWIT illustrates the findings from this study (Ashcraft, 2016).

In an economy that is increasingly dependent on science and technology, the STEM-educated professional has a range of career options. Professionals in STEM industries may find employment outside of the STEM workplace for various reasons. The competitive talent marketplace underscores the importance of STEM industries working to be an attractive option for women entering and remaining in the workforce.

FIGURE 4. WOMEN WHO LEAVE THE PRIVATE SET WORKFORCE—WHERE DO THEY GO?



A COLORADO ENGINEERING FIRM: TAKING A DIFFERENT PATH

Goodbee & Associates, Inc. (GA) is a full-service, civil engineering consulting firm that has been in operation since 1994 under the constant and capable leadership of Lisa Goodbee, Owner and President. When Goodbee started the company, she was driven by a deep commitment to create a different kind of engineering company – one where employees could thrive professionally and personally. Over the years, she notes that her success is demonstrating that "you can be a good employer, provide a positive and flexible work environment, and be a profitable and viable business." The tenure for engineers at GA is higher than the industry average. The company has also been recognized by its peers as Women's Transportation Seminar (WTS) Colorado **2011 Employer of the Year**, one of the **Top 100 Woman-Owned Businesses** in Colorado Biz (2015, 2011), and featured in the American Council of Engineering Companies (ACEC) **Engineering Colorado** magazine for their employee wellness program.

Not surprisingly, these accomplishments came about through a lot of hard work and trial and error. By focusing on creating a family friendly environment, she has had to work harder than most CEOs to manage a workforce that has many competing demands. But it's worth it, says Goodbee. "I strongly encourage a work-life balance, and discourage working over 40 hours a week – they need to have a good reason or get approval from me, if they need to work over 40 hours. It's important to have a home life. If you are doing an intense job and working over 40 or 50 hours a week then the quality drops. I know because I came from a company where people worked 60 hours a week and the quality of the work suffered." Sometimes that means she will need to redistribute the workload of her engineers, so no one has to work long hours. In turn, it means that her staff know they are valued and they value the opportunity to work at Goodbee.

"I would encourage other companies to be open-minded and to think outside of the box. Let go of the perception that if you have this certain model that you will not be a success."

Lisa Goodbee, Owner/ President

Goodbee & Associates, Inc. – Company Facts

- Lisa Goodbee, PE, President, co-founded the firm in 1994.
- Goodbee has found success in the field of utility coordination and been involved in nearly every major transportation project in the Denver and Colorado's Front Range region.
- Goodbee currently employs 15 employees (12 women and 3 men). Employee retention averages 10 years. Two-thirds of the employees are full-time, one-third part-time, and two employees job-share.
- In 2015 and 2011, Goodbee & Associates was recognized as one of the Top 100 Woman-Owned Businesses by ColoradoBiz Magazine.
- In 2015, Goodbee & Associates was featured in the American Council of Engineering Companies (ACEC) Engineering Colorado magazine for their employee wellness program.
- In 2011, Goodbee & Associates was honored to be named as the Women's Transportation Seminar (WTS) Colorado 2011 Employer of the Year as a firm who has enhanced the transportation industry. View the WTS Colorado Winner video to learn more.
- For more information on Goodbee & Associates, see http://www.goodbeeassoc.com/index.php

BARRIERS FOR WOMEN IN THE STEM WORKFORCE

Women are making significant contributions within STEM fields yet they are a distinct minority in these industries. While the low number of women graduating with engineering and computing science degrees has an influence on the number of women who are available to hire, it is not the only factor affecting a company's ability to recruit and retain women in STEM jobs. Recent research on why some women leave the engineering workforce and others stay indicates that the important variable is more often in the workplace, not the individual:

"Women who left engineering were less likely to have opportunities for training and development, support from co-workers or supervisor, and support for balancing work and non-work roles than were women who stayed in the profession. Female engineers who were most satisfied with their jobs, in contrast, worked for organizations that provided clear paths for advancement, gave employees challenging assignments that helped develop and strengthen new skills, and valued and recognized employees' contributions."

– AAUW, Solving the Equation

For women to be fully integrated into these fields, work environments must change. Subtle and unspoken bias, or unconscious bias, in the workplace creates barriers for women to fully contribute their ideas and leadership and leads to exclusion. For instance, the health sciences are now broadly viewed by society as "appropriate for women" while the physical sciences and engineering fields are still considered masculine arenas (Corbett & Hill, 2015). Men who major in engineering and computing have relatively strong implicit biases (defined as thoughts and feelings outside of conscious awareness and control) associating men with science, whereas women with similar degrees tend to have a relatively weak implicit bias linking men with sciences (Corbett & Hill, 2015). The unconscious biases that we all hold influence our behaviors and actions. Dissimilarity (in terms of gender, race, or other areas) and unconscious bias can result in lower levels of supervisor support and relationship quality; unclear or unfair promotion processes (including transparency, performance evaluation, opportunities, and advancement); and less access to professional development, social networks, and important committees.

In a Center for Talent Innovation study, a substantial majority of women working in science, engineering and technology (SET) companies in the U.S. perceive that there is significant gender bias at their companies. Seventy-two percent of women in SET companies perceive that there is gender bias in their performance evaluations, and 50 percent report that their coworkers appear to hold the belief that men have a genetic advantage in SET fields. Forty-six percent of women working in science, engineering and technology believe that senior managers have a propensity to view men as having greater "leadership material". Senior leaders, regardless of their gender, tend to agree with that assessment and nearly half (44 percent) report that they believe that a woman would never achieve a top position at their company, no matter how able or high-performing (Hewlett, S.A., 2014, HBR). When women are marginalized and do not feel supported, with no clear path for advancement, they may opt for another industry.

Researchers have identified five major patterns of gender bias that push women out of the STEM workforce. A study of female scientists also reveals that women of color experience these biases in different ways and to different degrees in the workplace (Williams, 2015).

Patterns of Gender Bias in the Workforce:

1. **Prove-it-again:** Women report having to continue to prove themselves and provide more evidence of their competence than men. Black women are even more likely than other groups of women to report this type of bias.
2. **The Tightrope:** Women balance between being seen as too feminine to be competent, and too masculine to be likeable. When women are successful in arenas that are considered male, women are less well liked than equally successful men. Not being liked by one's peers and supervisors can clearly affect one's career outcomes. Further, Asian American women are more likely than other groups to report feeling pressure to play a traditionally feminine role. Black and Latina women are at risk for being perceived as angry for behaving in stereotypically masculine ways.
3. **The Maternal Wall:** When professional women have children, their commitment and competence are questioned, and opportunities lessen. Male supervisors may believe they are being more considerate of women with children, when in fact women want opportunities that continue to advance their career. Supervisors should have conversations with their employees, before and after maternity leave, about continued career advancement.
4. **Tug of War:** While most women (three-fourths) report that women typically support one another in the workplace, over half of the women surveyed report conflict among women in the workplace. Women may distance themselves from other women or be harder on other women than male counterparts and question their level of commitment.
5. **Isolation:** Some women may keep social distance from colleagues to maintain the perception of competence and authority, and not know whom to trust. Isolation can also be due to exclusion by other employees. This bias is reported at a much greater degree by African American women than other groups of women, and was not evidenced in interviews with white women.

Black female scientists and Latina scientists are also more likely to report being mistaken for administrative or custodial staff.

Addressing the challenges of women in the STEM workforce requires workplace environments that provide flexibility, and promote a healthy work-life balance. Women in science, engineering, math, and technology jobs frequently report that their workplace cultures promote extreme hours and penalize those who need flexible work arrangements or use the company's work-life benefits. As a result, they also reveal a lack of self-confidence in their ability to manage their work-life responsibilities, and experience a hostile work environment towards women (Hewlett, S.A., 2014, HBR and Corbett & Hill, 2015). Fortunately, there are examples of STEM workplaces that actively promote and support a flexible, positive work environment for women.

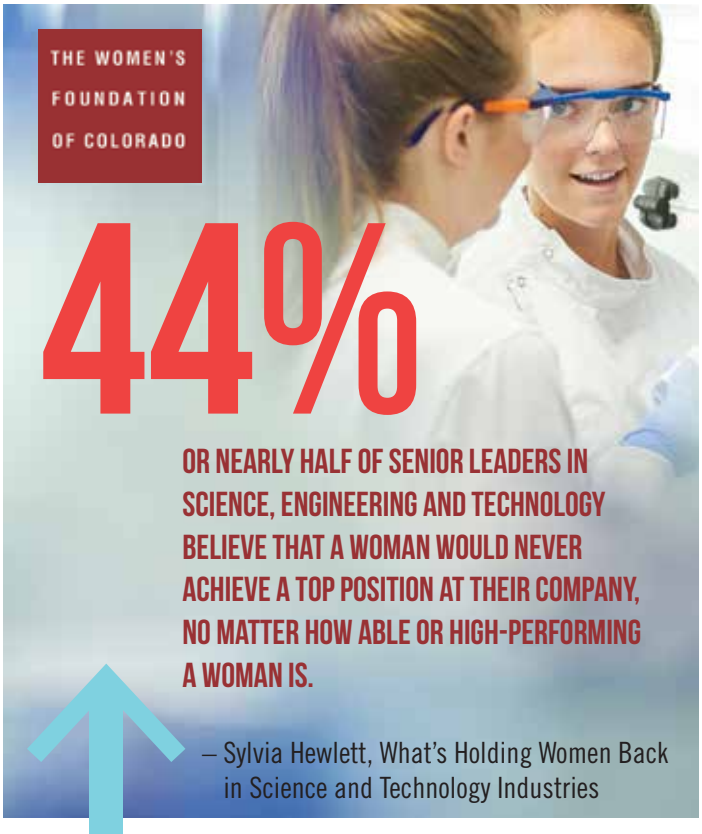
"Family formation, notably marriage and childbirth, is a key factor for the departure from the STEM workforce between Ph.D. receipt and achieving tenure for women in the sciences. Needed progress can take place only through changes in the attitudes, policies, and practices that inform how we educate the workforce and manage in the workplace."

– National Science Foundation Career-Life Balance Initiative

Key components of a healthier work environment for women and men should include manageable workloads and expectations that do not promote excessive hours on a routine basis, flexible work schedules, paid parental leave, and telecommuting. These types of workplaces are essential to attracting and retaining the best talent, especially given the increase in dual-career families – in fact, Millennials are twice as likely to have a spouse/partner working than Boomers. People across generations report work-life challenges and a desire for greater flexibility (EY, 2014). Moreover, women and men similarly value being a parent and having a successful marriage over the importance of a high-paying career (Patten, Parker, 2012).

"We finally get females into these roles, and at some point they want to get married and have children. The flexibility they need when they have a child is there and it is important. Men are not aware of it. I think there are some biases that we may be totally unaware of and it may impact how a woman does in a male dominated workplace."

– VP, Human Resources, Colorado-based oil and gas company



As the demand for STEM talent grows at nearly twice the rate of non-STEM jobs, the imperative to fully engage women in the STEM workforce intensifies. Companies cannot afford to miss, or even lose, this highly capable element of the workforce. Gender equity and inclusion in STEM is a significant challenge. Like any vexing problem, it will require the vision, commitment, persistence, and innovative thinking of multiple players, levels, and sectors. There are promising paths and levers for change. One of the country's largest tech companies, Intel, provides an illustration of what is possible with the commitment of leadership, financial, and human resources:

> *Intel launched their 300 million dollar, five-year plan for diversity and inclusion in 2015. While Intel has surpassed their 2015 hiring goals and shown what is possible by hiring a diverse, highly qualified slate of employees in high tech, there have been setbacks and lessons in how to do it better. Here's what worked: Intel set tangible diversity goals and held all employees accountable for these goals and saw twice the applicant referrals as previous years. Recruitment efforts took place in schools and conferences with diversity. The representation of women increased by 5.4 percent in 2015. Intel conducted a gender pay parity analysis. The company is now at 100 percent pay equity and in compliance with California pay equity law. They still have work to do, especially in their small gains in underrepresented minorities on staff, and a higher exit rate of African American employees than the rest of the staff. Retention strategies focused on community building, unconscious bias training, and integrating inclusive behaviors into the workplace have had mixed success. "We are still working on getting engineering bias out of our processes, and we need to do more," said Danielle Brown, Intel's Chief Diversity and Inclusion Officer in an interview (Dishman, 2016).*

75% OF MILLENNIALS WANT THE ABILITY TO WORK FLEXIBLY AND STILL BE ON TRACK FOR PROMOTION, **78% ARE PART OF DUAL-CAREER COUPLES,** AND **80% SAID THEIR TOP REASON TO STAY IN A JOB WAS COMPETITIVE PAY AND BENEFITS, INCLUDING FLEXIBILITY.**

– EY, Millennials: "Generation Go"

PATHWAYS TO GENDER EQUITY AND INCLUSION IN STEM WORKFORCES

Colorado companies that want to create more equitable and inclusive STEM workforces have ample opportunities to do so. By working together to improve their industries and the experiences that women have across the board, starting with improving educational opportunities and outcomes, they can create more inviting and inclusive fields that will improve outcomes for all companies in the state. By working to build more inclusive organizational cultures and implementing policies and practices within their organizations, they can become more competitive within their industry and increase the likelihood of successful retention and recruitment of women in their companies. And by examining the possibility that their own unconscious bias, and that of their colleagues, might be having an impact on the experiences of women in their companies, they can take meaningful steps individually and change policy and procedures to help advance of a culture of equity and inclusion.

FIGURE 5. PATHWAYS TO INCREASING GENDER EQUITY AND INCLUSION IN COLORADO'S STEM INDUSTRIES

PATHWAYS TO SUCCESS: STEM Industries in Colorado

Colorado has rich and vibrant STEM industries that need industry-wide leadership and investment in order to also become more equitable and inclusive. To deal with the long-term challenges of building industries that are truly inclusive, Colorado companies can:

1. Invest in building the pipeline of women who are educated in STEM industries by supporting educational initiatives and advocacy efforts designed to hold post-secondary institutions accountable to aggressive STEM graduation goals. Projects such as the Colorado Education Initiative's Colorado STEM Resources and Roadmap, which is focused on strengthening STEM education and training, can go a long way toward supporting the whole field.

2. Partner and invest in groups with programs and missions designed to increase awareness of the challenges facing STEM industries and provide tools and resources to companies and individual women seeking to get in – or stay in – and advance in the STEM industries. Groups in this area include the Society of Women Engineers, Women in Transportation Seminar (with a Colorado chapter), Catalyst, National Center for Women and Information Technology, Anita Borg Institute, American Association of University Women, and the Center for Talent Innovation.

3. Partner with state-level initiatives focused on the STEM workforce, and insist that industry-level data about the STEM workforces be disaggregated and cross-tabulated by gender and race. Research efforts such as the Colorado Talent Pipeline Report need to include information on the underrepresentation of women in the tech intensive industries. Groups such as The Colorado Technology Association and the Colorado Urban Workforce Alliance in the Metro-Denver area need to integrate women into their efforts to develop the technology talent pipeline.

4. Initiate and support specific initiatives in Colorado that improve opportunities for women in STEM industries. The White House's TechHire Initiative is a call to action for communities to expand pathways for those who are underrepresented in tech fields. Colorado is in the first wave of communities with commitments to work with employer partners. The STEM Re-entry Task Force is a partnership of the Society of Women Engineers and iRelaunch to create opportunities for engineers to get back to their technical careers, modeled after the re-entry programs that have successfully increased the representation of women in the finance industry.

A GLOBAL ENGINEERING FIRM IN COLORADO: MOVING THE DIAL ON GENDER EQUITY AND INCLUSION IN THE WORKPLACE

As a global engineering firm, CH2M prides itself on tackling some of the world's most complex and difficult challenges through collaboration with governments, businesses, and communities. The leadership of CH2M has also recognized that in order to continue to thrive and excel in a very competitive industry, it would have to take on another challenging but critical effort: developing a more diverse and inclusive workforce. Valencia Faye Tate, Director of Global Diversity, Equality, and Inclusion (DEI) at CH2M, takes the long view of this important work and sees the overall benefits of CH2M's persistent and continuous focus on diversity and inclusion in all aspects of the company. According to Tate, the changes that have been made in organizational policy and procedures; employee recruitment, development, and advancement; employee engagement; and the way they do business have made CH2M employees work better and smarter, and be more competitive.

In CH2M's focus on diversity, equality and inclusion, Tate sees the big picture both for her company and the industry. "It's been a journey, and you have to remain focused, energetic, and passionate about this work. The change may not be quick, but if you stay focused and keep the spotlight on the work and the positive impact this work has on CH2M as a business, then that is the reward. Sometimes it is hard to see the results, but I am grateful that we have been engaged in this work for quite some time." Indeed, for over a decade CH2M has been aggressively cultivating a culture where women in STEM positions can excel. During this time, the company has made significant progress on advancing women in the engineering and construction industries, with praiseworthy recognition and awards for their results. But, as Tate is quick to point out, "We don't have the secret potion and we know there is more work to be done."

Valencia Faye Tate, Director of Global Diversity, Equality, and Inclusion

"One of the guiding principles for our Board of Directors' leadership is to bring diversity to the group in order to broaden our perspective and to better reflect our clients and stakeholders... Our success as a company is based on the success of our people, and our values are reflected in how we work every day through a culture that reinforces collaborative and inclusive behavior."

In the male-dominated engineering field, there continues to be the opportunity to, as Tate says, "Create an environment that is welcoming for women and supports the elevation of women in the engineering industry. For women coming in, you need to have mentors, coaches, and advocates, because it can be a challenging environment." At the highest levels of the company, CH2M remains focused on sustaining the gains they have made as a part of their strategic commitment to have the best talent and be a successful company in the global marketplace. CH2M has also made a commitment to moving the dial on women in the engineering industry by improving the STEM talent pipeline through its work with organizations such as Women in Transportation Seminar (WTS), the Society of Women Engineers (SWE), the National Society of Black Engineers, and the Conference of Minority Transportation Officials.

CH2M Diversity, Equality and Inclusion (DEI)

- Eight Global Employee Network Groups (ENG), including the **Global Women's Network** with local chapters, promote and support the attraction, development, and retention of women at CH2M. In 2014, the company held their first-ever diversity summit of the eight ENGs with 140 employees from 12 countries to share ideas and resources, and inform the companies DEI initiatives. The next diversity summit will be held in the fall of 2016.
- Thirty-one percent of employees in 2015 were women and 20% were people of color
- Twenty-seven of the board of director positions in 2014 were women, including the Chairman and Chief Executive Officer: Jacqueline Hinman, P.E. LEE
- **CH2M Foundation** supports STEM programs in schools and employee opportunities to serve as role models and mentors to future generations of female engineers.
- CH2M received the **2020 Women on Boards** award winner in 2014 for those companies with 20 percent or more of women representation on board of directors.
- In 2014, CH2M received the **Glass Hammer Award** from the American Road and Transportation Builders Association's. CH2M was awarded based on their innovative initiatives to promote women leaders, including their Women's Employee Network with 1,100 active members worldwide, with proven results in nearly 30 percent female representation of employees, and a number of women in high profile positions. Also, CH2M's commitment to organizations such as the Conference of Minority Transportation Officials and Women's Transportation Seminar was taken into account.
- In 2009, CH2M was the **Catalyst Award Winner** for CH2M's Constructing Pathways for Women Through Inclusion initiative that "utilizes the company's long-standing inclusive workplace to accelerate women's advancement." The initiative included regional women's networks for learning and mentoring opportunities; strategic learning opportunities for women leaders; targeted and intense recruitment of women (new graduates and experienced hires) and people of color; and a succession planning process to ensure a diverse lineup into the future. The most notable results at the time were increases in women's representation in senior leadership and as project managers over a three- to five-year time period. CH2M is the first Catalyst Award winner in the engineering and construction industry. View the CH2M Winner Video.
- For more information, see CH2M Sustainability & Corporate Citizenship Report

CH2M – Company Facts

- **CH2M** is an employee-owned, global company headquartered in Englewood, Colo. offering a diverse array of engineering and environmental consulting services from program and project management, design, design-build, and construction management in partnership with government, communities, businesses, and organizations. The work is guided by the three pillars of Safety, Ethics, and Sustainability.
- Chairman and Chief Executive Officer: Jacqueline Hinman, P.E. LEE
- In 2015, CH2M worked with 5,000 clients from more than 50 countries to positively impact 10,000 communities and produced $5.4 billion in revenue.
- The impact CH2M is most proud of: 24,000 employee livelihoods; $440 million in revenue redistributed to local minority, women, and veteran-owned small businesses; $1million CH2M Foundation gives to STEM education and sustainable community efforts; 53% better global safety performance compared to U.S. industry average; 8 years in a row recognized as one of the world's most ethical companies by Ethisphere Institute.

"One of the guiding principles for our Board of Directors' leadership is to bring diversity to the group in order to broaden our perspective and to better reflect our clients and stakeholders... Our success as a company is based on the success of our people, and our values are reflected in how we work every day through a culture that reinforces collaborative and inclusive behavior."

– Jacqueline Hinman, P.E. LEE, Chairman and CEO

PATHWAYS TO SUCCESS: STEM Companies in Colorado

Systemic Change Framework

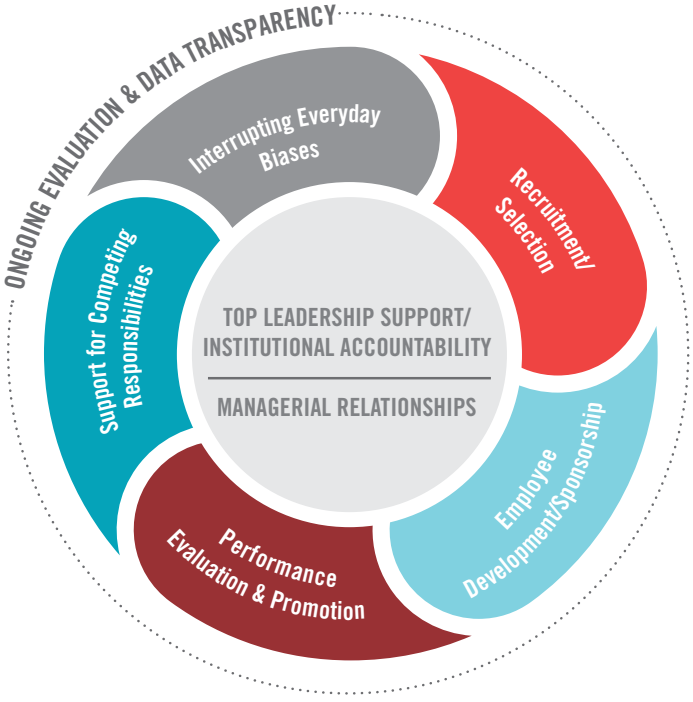
Colorado companies that are committed to having more women in leadership and throughout the ranks can consider implementing the following changes in organizational policies and practices, and review the comprehensive Gender Equity Resource List posted on The Women's Foundation of Colorado's website. The National Center for Women and Information Technology (NCWIT) presents an ecosystem approach to achieving meaningful changes inside companies that are committed to gender equity and inclusion. At the core of NCWIT's model are three foundational steps that are critical to the success of these change efforts:

1. Establish top leadership support and institutional accountability
2. Educate managers and improve managerial relationships
3. Ongoing data collection and transparency (Ashcraft et. al., 2016).

"[BY] TREATING THESE [CHANGE] EFFORTS LIKE ANY OTHER SERIOUS BUSINESS IMPERATIVE, ALLOCATING SIGNIFICANT FINANCIAL AND HUMAN RESOURCES TO THE IMPLEMENTATION OF RESEARCH-BASED PRACTICES, SETTING GOALS, AND TRACKING PROGRESS. ONLY THEN WILL COMPANIES, AND SOCIETY AT LARGE, BENEFIT FROM THE MANY ADVANTAGES DIVERSITY BRINGS TO INNOVATION, PRODUCTIVITY, AND PROBLEM SOLVING"

(10 Actionable Ways to Actually Increase Diversity in Tech, NCWIT).

FIGURE 5.1. NCWIT Industry Systemic Change Model



- **Top Leadership Support / Institutional Accountability**

Top-level leaders need to make a long-term commitment to developing an inclusive workplace. There is no one solution that will work for all organizations. Companies need to engage in multi-pronged efforts at the systems and individual levels to recruit, retain, and advance women in the workforce. **Women leaders** on the executive team and on boards can have a significant, positive impact on gender diversity throughout all levels of the company, and in the STEM field as a whole.

Male champions and advocates can take an active role in bringing more women to STEM industries and help women achieve the highest levels of leadership, both within their own companies and the industry as a whole. Men are essential to successful change efforts within most workplaces where white males hold the majority of leadership positions. Moreover, everyone in the company can benefit from less rigid standards around gender and other identities, and greater productivity. Groups such as Men Advocating Real Change (MARC), Catalyst, and the National Center for Women and Information Technology (NCWIT) actively work to develop male allies and advocates. Women in Transportation Seminar (WTS) Colorado recently recognized a male champion who challenged every firm in Colorado to have women in a leadership role.

- **Ongoing Evaluation and Data Transparency**

Understand the current situation and data regarding gender diversity, set tangible outcomes, hold individuals accountable, and monitor progress. Baseline data can establish where things stand in your company on gender diversity and inclusion. Then, use data as an ongoing feedback mechanism, and do something different in order to get the results you desire. Seek out best practices and share your successes and learning points with the field. Learn from your peers and know where you stand in regards to gender equity and inclusion relative to others in your field.

- **Managerial Relationships / Performance Evaluation and Promotion**

The managerial relationship is often cited by literature and experts in the field as one of the most critical elements of success in gender equity and inclusion efforts in a workplace. Women who left a STEM workplace were less likely to report support from a manager, opportunities for development, and support for work-life balance. Focus on educating and training managers to be **inclusive leaders.** Assess the company's **supervisory relationships, performance criteria, and promotion** policies and practices for inclusivity and unconscious bias. Well-defined performance evaluations that are gender neutral, clear paths toward advancement, and strong supervisory relationships are important factors to retaining highly qualified women.

"WHO BETTER TO HELP US ACHIEVE THE WTS MISSION—TO BUILD THE FUTURE OF TRANSPORTATION THROUGH THE GLOBAL ADVANCEMENT OF WOMEN—THAN MEN?" SAYS MARCIA FERRANTO, WTS INTERNATIONAL'S PRESIDENT AND CEO. "WHEN MEN MAKE UP 50% OF WTS INTERNATIONAL'S MEMBERSHIP, WE WILL MOVE THE NEEDLE."

- **Recruitment and Selection**

Assess your **recruitment and hiring** policies and practices and solicit internal feedback on how these practices are influencing gender diversity and inclusion. Make sure you are really finding and attracting the best talent out there, and avoid the pitfalls of companies hiring people like themselves. Companies have seen increases in female applicants by removing gender bias language and unnecessary skills in **job postings and descriptions**. Consider the necessary qualifications for the job, and the non-technical skills required to be successful. Women are less likely than men to apply for a job when they do not think they are qualified, even when they are more qualified than their male counterparts.

Ensure there is a diverse slate of applicants by seeking out **diverse avenues of recruitment,** and build a gender-inclusive hiring process. Invest in the development of employees. Consider **re-entry or on-ramping programs** for women who want to get back into their technical field. And, **leverage peer relationships** for attracting and retaining entry-level female engineers.

- **Employee Development / Sponsorship**

Growing the potential of your employees is a critical component of retaining and advancing women in your company. Many women in STEM companies report feeling stalled in their careers with an unclear path for advancement, and will then move on to other companies/ industries. Create a **"growth mindset"** company, a concept applied to STEM education and increasingly seen as an advantage to companies' innovation capacity and a diverse workforce. To promote diverse talent **consider** adding sponsors (powerfully positioned and proactive champions) into your organizational practice as an important lever to increase the advancement of women in the STEM workplace. A sponsor may be male or female, and this individual's support can result in women asking for a big opportunity, seeking a raise, and being satisfied with her rate of advancement. **Mentors,** who advise on career paths, are also important in employee development, but serve a different purpose. Isolation can also be a factor for women in a majority-minority environment, which is particularly experienced by women of color. Ensure that women employees have equal access to growth opportunities, professional development, and **support and professional networks** of other technical women. Examples of these groups include the Society of Women Engineers, Women in Transportation Seminar chapters, Women Who Code chapters, Systers e-mail list hosted by Anita Borg Institute, Moxie Exchange Movement, and the Leadership Investment.

- **Workplace Flexibility / Support for Competing Life (Non-work) Responsibilities**

Develop a **supportive and flexible workplace** in which employees can address competing responsibilities, with manageable workloads and expectations that do not require excessive hours on a routine basis. Companies should not only have work-life benefits, but also a culture where employees do not feel penalized for using these benefits or that it adds to their work and nonwork conflicts. These types of workplaces are essential to attracting and retaining the best talent, especially given the increase in dual-career families, and benefit all employees. People across generations report work-life challenges and a desire for greater flexibility.

Showcase how the work of engineering and computing benefits society, and the exciting opportunities to tackle pressing issues. Provide opportunities for employees to engage in work and related volunteer opportunities with clear societal impacts. Women and men can seek

out opportunities to serve as a **role model** and encourage girls and young women to consider engineering and computing. Role models can share the work that they do each day, the societal benefits of the work, and the breadth of STEM careers and skill sets.

- **Unconscious / Implicit Bias**

The STEM workforce in Colorado will only become more diverse and inclusive if the people who comprise that workforce each commit to doing their part to make advances in their companies and their industries. Embarking on this journey can be deeply rewarding, especially when the result is an increasingly diverse and productive workforce. When individual employees and leaders commit to examining their own roles in perpetuating or **disrupting bias** in hiring and management practices, whole companies can change. For instance, men can also be the ones to speak up when they see a female colleague's idea is not being heard or her competence is being questioned.

Organize internal educational efforts that can provide you and the employees around you with a shared **understanding of what implicit bias is** and how it influences your organizational culture. **Assess your own individual bias** and engage your peers in a conversation about how your respective biases might influence your behaviors in hiring and how you treat one another in the workplace. Look for opportunities to disrupt bias in your workplace from daily interactions to systems change. Work with an **equity and inclusiveness coach** who can facilitate courageous conversations and help you recognize bias when it happens and respectfully challenge yourself and others when you see it happening.

CONCLUSION

There has never been a better time to work together to advance gender equity and inclusion in Colorado's STEM workforces. Our economy is strong and STEM industries are growing. But not everyone in Colorado is able to take advantage of our abundance, and we are not yet experiencing the benefits that thousands of women can bring as STEM leaders and employees. The Women's Foundation of Colorado and our STEM Coalition are excited to work with companies and industries throughout the state to help us all get on – and stay on – the path to ensuring that everyone in our state has the opportunity to be an active part of Colorado's future growth.

WFCO's STEM Employers Resource List provides more information and is available in the next section and at www.wfco.org/STEM.

STEM EMPLOYERS GENDER EQUITY

RESOURCE LIST

Introduction

The **STEM Employers Gender Equity Resource List** provides tools, information, practices and policies for Colorado companies in the science, technology, engineering, and math (STEM) industries that are committed to making meaningful change by having more women in leadership positions and throughout the ranks, and creating an inclusive environment for all. We must improve educational opportunities and outcomes while also supporting systems-wide and inter-organizational change in STEM fields. By working together to improve their industries and the experiences that women have across the board, we can see women represented in STEM numbers that reflect our state's workforce. In addition to providing good jobs to women in Colorado, increasing the number of women in STEM companies is good for business, innovation, and the talent pipeline.

Colorado's STEM community is working tirelessly to improve education and training in schools. This is essential to achieving a diverse STEM workforce. Developing inclusive companies and industries where all can thrive and innovate for the future is of equal importance. We cannot afford to not attract women and to continue to lose the female talent coming into the STEM workplace. For example, half of women technologists drop out of the workforce between entry and executive level. (Anita Borg Institute) We can do better. We need to work on both education and the workplace synergistically. By working to build more inclusive **organizational cultures** and implementing policies and practices, Colorado companies can become more competitive within their industries and increase the likelihood of successful recruitment, retention, and advancement of women in the STEM workplace.

> "[BY] TREATING THESE [CHANGE] EFFORTS LIKE ANY SERIOUS BUSINESS IMPERATIVE, ALLOCATING SIGNIFICANT FINANCIAL AND HUMAN RESOURCES TO THE IMPLEMENTATION OF RESEARCH-BASED PRACTICES, SETTING GOALS, AND TRACKING PROGRESS. ONLY THEN WILL COMPANIES, AND SOCIETY AT LARGE, BENEFIT FROM THE MANY ADVANTAGES DIVERSITY BRINGS TO INNOVATION, PRODUCTIVITY, AND PROBLEM SOLVING."
>
> – NCWIT (10 Actionable Ways to Actually Increase Diversity in Tech, Fast Company)

To see the financial, organizational, and societal benefits of a diverse workforce and inclusive organizational culture, organizations must use a systematic approach and change model. The **National Center for Women and Information Technology** presents an ecosystem approach to achieving meaningful changes inside companies that are committed to gender equity and inclusion. The core of their model consists of three foundational steps critical to the success of change efforts: 1) establish **top leadership support and institutional accountability**, 2) educate managers and improve **managerial relationships,** and 3) ongoing **data collection and transparency.**

Resources from various sources on STEM and women in the workforce are organized throughout this site based on NCWIT's model.

RESOURCE LIST

Opportunities to Support Change in STEM Industries

National and state-level initiatives and networks are working towards gender equity and inclusion in the STEM workplace and industries. These are partners and opportunities for coalitions, companies, and individual leaders to be a part of larger change initiatives and networks in Colorado and the nation.

National Level Initiatives, Networks, and Organizations on Women in STEM workforce:

- Women On Board, Catalyst: Promotes the appointment of women to corporate boards
- Grace Hopper Celebration of Women in Computing, Anita Borg Institute
- NCWIT Summit, National Center for Women and Information Technology
- Society of Women Engineers, national networks and resources
- STEM Re-entry Task Force, SWE and iRelaunch partnership: Re-entry platform for engineers to get back to their technical careers
- Systers, Anita Borg Institute: Networks of technical women in computing
- Women of Color STEM Conference
- Workforce Alliance, National Center for Women and Information Technology
- Women in STEM, The White House's Office of Science and Technology Policy: Initiatives and resources to advance women STEM students and researchers
- 2020 Women on Boards: National campaign to increase the percentage of women on U.S. company boards to 20% or more by 2020

Colorado Initiatives, Networks and Organizations on Women in STEM

- Clean Energy & Empowerment (C3E), Colorado Clean Energy Cluster: Workforce development and networking initiative for women in clean energy
- Colorado Technology Association's Women's Network: Networking and professional development opportunities, including an annual conference
- Women in Transportation, Colorado Chapter: Networking, events and professional development opportunities
- Women Who Code: Inspiring career-aged women to excel in technology, with networks in Fort Collins and Boulder/Denver

Colorado STEM Education Initiatives and Resource Sites

- Colorado Collaborative for Girls in STEM: National Girls Collaborative Project model to bring together organizations that are committed to engaging girls in STEM
- Colorado Education Initiative: STEM: Strengthening STEM education and training
- Colorado STEM, Collaborative to improve STEM education and training in Colorado schools
- The Women's Foundation of Colorado STEM Initiative: Improving educational and career opportunities for girls and women in STEM fields

RESOURCE LIST

Top Reports on Gender Equity and Inclusion in the STEM Workplace

These current reports are mainly focused on women in the STEM workforce and gender equity and inclusion in the workplace. Each of these documents contains key information, studies, statistics, and/or reference points about the topic of women in the STEM workplace.

- Athena Factor 2.0: Accelerating Female Talent in Science, Engineering & Technology, Center for Talent Innovation
- Climbing the Technical Ladder, Anita Borg Institute and Clayman Institute for Gender Research
- Innovation by Design: The Case for Investing in Women, Anita Borg Institute
- Solving the Equation: The Variables for Women's Success in Engineering and Computing, American Association of University Women
- Stemming the Tide: Why Women Leave Engineering, University of Wisconsin-Milwaukee
- What's Holding Women Back in Science and Technology Industries, Center for Talent Innovation
- Why Diversity Matters, Catalyst
- Why Diversity Matters, McKinsey & Co.
- Women in Tech: The Facts, National Center for Women and Information Technology
- Women in the Workplace, McKinsey & Co. and LeanIn

Top Sites on Gender Equity and Inclusion in the STEM Workplace

Organizations with a focus on advancing gender equity and inclusion on women in the STEM workforce are listed below. These sites offer a variety of information and research-backed resources for companies and individuals.

- American Association of University Women: Advancing equity for women and girls through advocacy, education, philanthropy, and research
- Anita Borg Institute: Working to ensure that the creators of technology mirror the people and societies who use it by offering programs, awards, grants, and research for women technologists and organizations building innovation-driven teams
- Catalyst: Accelerating progress for women through workplace inclusion, with research, strategy, connections, and leadership
- Center for Talent Innovation: Driving ground-breaking research and create a community of senior executives united by an understanding that full utilization of the global talent pool is at the heart of competitive success
- National Center for Women and Information Technology: Correcting the imbalance of gender diversity in technology and computing because gender diversity positively correlates with a larger workforce, better innovation, and increased business performance

RESOURCE LIST

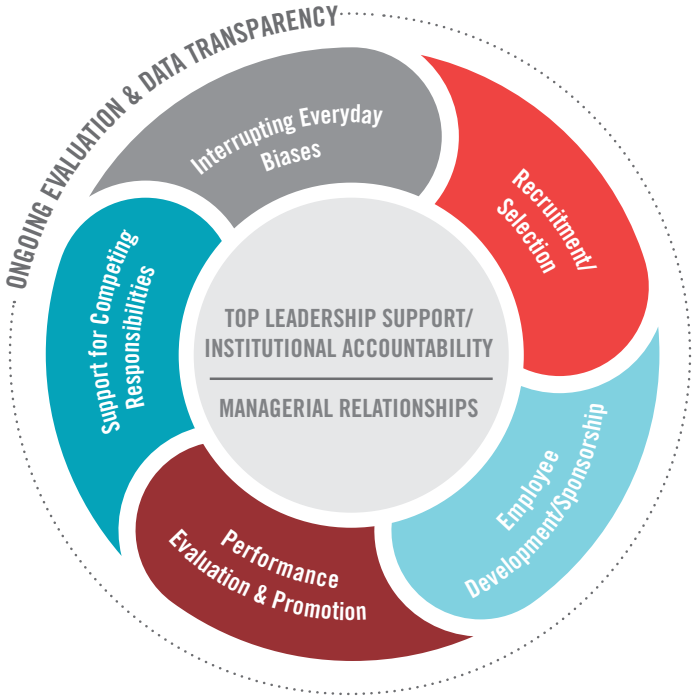
STEM Data Sites and Reports on the Workplace

- Real-Time Insight into the Market for Entry-Level STEM Jobs, Burning Glass
- The Colorado Talent Pipeline Report, Colorado Workforce Development Council
- NACME Research Publications, National Action Council for Minorities
- Women and Minorities in S&E Workforce, National Science Foundation
- The Hidden STEM Economy: Key Findings, The Brookings Institute
- Science and Engineering Indicators 2016, National Science Foundation
- Trends & Stats, Society of Women Engineers
- 7 Things to Know if You're Thinking About a STEM Career, U.S. Departments of Labor

Systemic Change Framework

Colorado companies committed to having more women in leadership and throughout their ranks can consider implementing the following changes in organizational policies and practices. For companies to institute lasting change to become more equitable and inclusive of women and other underrepresented groups, changes need to be implemented on multiple levels over time. This change does not always come easily, and requires innovative thinking and approaches to obtain a different kind of result. The imperative for Colorado companies to change has never been more clear.

FIGURE 5.1. NCWIT Industry Systemic Change Model



RESOURCE LIST

Making the Case for Top Leadership Support and Institutional Accountability

Top-level leaders need to make a long term commitment to developing an inclusive workplace. There is no single solution that will work for all organizations. Companies need to engage in multi-pronged efforts at the systems and individual levels to recruit, retain, and advance women in the workforce. **Women leaders** on the executive team and on boards can have a significant, positive impact on gender diversity throughout all levels of the company, and in the STEM field as a whole. **Male champions and advocates** are also essential to successful change efforts within most workplaces where white males hold the majority of leadership positions.

- Companies Behaving Responsibly: Gender Diversity on Boards, Catalyst: Infographic on gender diversity on boards
- Diversity in the Workplace, Bloomberg video: Interview with Anita Borg Institute CEO
- Fostering Innovation Through a Diverse Workforce, Forbes Insights: Survey of executives on diversity and inclusion strategies, measuring impact, and barriers
- Increase Gender Diversity on Corporate Boards, Catalyst: Various board resources
- Tech's Big Gender Diversity Push, Fast Company: Article on tech company's progress on gender diversity and inclusion efforts
- Think People, Not Just Programs, To Build Inclusive Workplaces, Catalyst: Study on organization change and building inclusive cultures
- Women On Board, Catalyst: Promotes the appointment of women to corporate boards
- 2020 Women on Boards: National campaign to increase the percentage of women on U.S. company boards to 20% or more by 2020

Company Examples - Resources and Information

Information, videos, and interviews on STEM companies working towards gender equity and inclusion in the STEM workforce.

CH2M

- Constructing Pathways for Women Through Inclusion, Catalyst Practice
- CH2M Winner Video, Catalyst Award
- CH2M: Workforce Diversity, Equality, and Inclusion Measures
- CH2M: Sustainability & Corporate Citizenship Report

Chevron

- The Chevron Way: Engineering Opportunities for Women, Catalyst Practice
- Chevron Winner Video, Catalyst Award

RESOURCE LIST

EY

- A Recognized Commitment to Women's Leadership, EY
- Diversity and Inclusiveness Means Growth, EY

Lockheed Martin

- Interview Series with Marillyn Hewson, CEO of Lockheed Martin, Catalyst: Variety of topics including building an inclusive culture and leadership
- Lockheed Martin Winner Video, Catalyst Award
- Women Accelerating Tomorrow, Catalyst Practice

Data Transparency

Understand the current situation and data regarding gender diversity, set tangible outcomes, hold individuals accountable, and monitor progress. Baseline data can establish where things stand in your company on gender diversity and inclusion. Then, use data as an ongoing feedback mechanism, and do something different in order to get the results you desire. Seek out best practices and share your successes and learning points with the field. Learn from your peers and know where you stand in regards to gender equity and inclusion relative to others in your field.

- Data Collection and Strategic Planning Guidelines, National Center for Women and Information Technology
- Leadership Index: Measures, Anita Borg Institute
- Gender Diversity Index, 2020 Women on Board

Male Allies and Advocates

Male allies and advocates can take an active role in recruiting and retaining women in STEM industries and help women achieve the highest levels of leadership, both within their own companies and the industry as a whole. Male allies can be powerful influencers starting with daily interactions and on to the larger systems change to move the needle on gender equity and inclusion. Moreover, everyone in the company benefits from less rigid standards around gender and other identities and greater productivity.

- Annual Awards for Men, Women in Transportation Seminar (WTS)
- Engaging Men in Gender Initiatives, Catalyst
- MARC: Men Advocating Real Change, Catalyst
- Male Allies and Advocates, National Center for Women and Information Technology
- Men Matter, Catalyst

RESOURCE LIST

Managerial Relationships / Performance Evaluation and Promotion

The managerial relationship is often cited by experts in the field as one of the most critical elements of success in gender equity and inclusion efforts in a workplace. Women who left a STEM workplace were less likely to report support from a manager, opportunities for development, and support for work-life balance. Focus on educating and training of managers to be inclusive leaders. Assess the company's supervisory relationships, performance criteria, and promotion policies and practices for inclusivity and unconscious bias. Well-defined performance evaluations that are gender neutral, clear paths toward advancement, and strong supervisory relationships are important factors to retaining highly qualified women.

- Are You An Inclusive Leader? Catalyst
- Be Inclusive, Catalyst
- Cascading Gender Biases, Compounding Effects: An Assessment Of Talent Management Systems, Catalyst
- How to Retain Women Technologists, Anita Borg Institute
- Innovation, Diversity, and Market Growth, Center for Talent Innovation
- Supervising-in-a-Box: Full Series, NCWIT
- Women Technologists Count, Anita Borg Institute

Recruitment and Selection

Assess your recruitment and hiring policies and practices and solicit internal feedback on how these practices are influencing gender diversity and inclusion. Make sure you are really finding and attracting the best talent out there, and avoid the pitfalls of companies hiring people like themselves. Companies have seen increases in female applicants by removing gender biased language and unnecessary skills in job postings and descriptions. Consider the necessary qualifications for the job, and the non-technical skills required to be successful. Women are less likely than men to apply for a job when they do not think they are qualified, even when they are more qualified than their male counterparts.

Ensure there is a diverse slate of applicants by seeking out diverse avenues of recruitment, and work to make the hiring process gender inclusive. Invest in the development of employees. Consider re-entry or on-ramping programs for women who want to get back into their technical field. And, leverage peer relationships to attract and retain entry-level female engineers.

- Breaking Down the Gender Challenge, McKinsey
- Can You Spot the Gender Bias in this Job Description? Catalyst
- Employee Recruitment Selection and Writing Better Job Ads, NCWIT
- Five Things STEM Companies Can Do To Attract And Retain Women, Catalyst

RESOURCE LIST

- Peer Relationships Retaining Women Engineers, SWE
- Recruiting and Retaining More Women in IT Organizations, McKinsey
- Seeking Female STEM Employees? Find Those On Career Break, Skilled Up
- Solutions to Recruit Technical Women and Infographic, Anita Borg Institute
- STEM Re-entry Task Force, SWE and iRelaunch

Employee Development / Sponsorship

Growing the potential of your employees is a critical component of retaining and advancing women in your company. Many women in STEM companies report feeling stalled in their careers with an unclear path for advancement, and will then move on to other companies/industries. Create a "growth mindset" company, a concept applied to STEM education and increasingly seen as an advantage to companies' innovation capacity and a diverse workforce. To promote diverse talent consider adding sponsors (powerfully positioned and proactive champions) into your organizational practice as an important lever to increase the advancement of women in the STEM workplace. A sponsor may be male or female, and this individual's support can result in women asking for a big opportunity, seeking a raise, and being satisfied with her rate of advancement. Mentors, who advise on career paths, are also important in employee development, but serve a different purpose. Isolation can also be a factor for women in a majority-minority environment, which is particularly experienced by women of color. Ensure that women employees have equal access to growth opportunities, professional development, and support and professional networks of other technical women.

- Accelerating Women's Progress, EY
- Employee Development, Supervising Box Series, NCWIT
- Employee Resource Groups and the Employee Resource Leadership Initiative, Catalyst
- Harnessing the Power of the "Growth Mindset", Clayman Institute for Gender Research
- How Companies Can Profit from a "Growth Mindset", Harvard Business Review
- How to Advance Women Technologists, Anita Borg Institute
- Marillyn Hewson Interviews, Lockheed Martin, CEO on Mentoring and Sponsoring and Being a Leader, Catalyst
- Mentors Are Good. Sponsors Are Better, New York Times
- Micro-sponsorship: A Tool to Combat Micro-inequities, Clayman Institute for Gender Research
- Networking and Mentoring, Clayman Institute for Gender Research
- The Real Benefit of Finding A Sponsor, Harvard Business Review
- The Right Way to Find a Career Sponsor, Harvard Business Review
- Sponsorship Toolkit, NCWIT
- 8 Ways to Give Employees More Effective Feedback Using a Growth Mindset, NCWIT

RESOURCE LIST

Workplace Flexibility / Support for Competing Life (Non-work) Responsibilities

Develop a supportive and flexible workplace for employees facing competing responsibilities with manageable workloads and expectations that do not require excessive hours on a routine basis. Companies should not only have work-life benefits, but also a culture where employees do not feel penalized for using these benefits or that it adds to their work and nonwork conflicts. These types of workplaces are essential to attracting and retaining the best talent, especially given the increase in dual-career families – in fact, Millennials are twice as likely to have a spouse/partner working than Boomers. People across generations report work-life challenges and a desire for greater flexibility. Moreover, women and men similarly value being a parent and having a successful marriage over the importance of a high-paying career.

- A Gender Reversal on Career Aspirations, Pew Research Center
- Balancing the Scale: NSF's Career-Life Balance Initiative, National Science Foundation
- Balancing Work and Life: Family Friendly Workplace Policies, American Association of University Women
- Flexibility Makes It All Possible, EY
- Flex Works, Catalyst
- The Great Debate: Flexibility Vs. Face Time: Busting The Myths Behind Flexible Work Arrangements, Catalyst
- How Can Companies Attract and Retain Mid-career Female Employees? NCWIT
- People Want Flexibility, EY
- Working Parents, Catalyst
- Work-Life Challenges Across Generations, EY

Unconscious / Implicit Bias

Internal change within a company starts with the individuals within a company. Embarking on a journey to become more equitable and inclusive can be deeply rewarding, especially when the result is an increasingly diverse and productive workforce. When individual employees and leaders commit to examining their own roles in perpetuating or disrupting bias in hiring and management practices, whole companies can change.

The journey begins when individuals commit to organizing internal educational efforts that lead to a shared understanding of what implicit bias is and how it influences organizational culture. Individuals can also assess their own individual bias and engage their peers in conversations about how biases might influence behaviors in hiring and how people treat one another in the workplace. Employees at all levels, but especially in leadership, can look for opportunities to disrupt bias in the workplace from daily interactions to systems change. Work with an equity and inclusiveness coach can facilitate

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courageous conversations and help employees recognize bias when it happens and respectfully challenge one another when they see it happening.

- Brain Researcher Takes on Bias, McKinsey & Co.
- The Color of Leadership: Barriers, Bias, and Race, American Association of University Women
- Critical Listening Guide, NCWIT
- Double Jeopardy? Gender Bias Against Women of Color in Science, Work Life Law, US Hastings College of Law
- Facebook is Trying to Make Its Workers Check their Privilege, Next Web
- Feeling Different: Being The "Other" In US Workplaces, Catalyst
- How Can Reducing Unconscious Bias Increase Women's Success in IT? NCWIT
- How to Fight Your Own Implicit Biases, American Association of University Women
- Implicit Association Test, Project Implicit, Harvard
- Implicit Association Test, McKinsey & Co.
- Implicit Bias, White House Office of Science and Technology Policy
- Managing Unconscious Bias, https://managingbias.fb.com/, Facebook
- My Aha Moment: Was It Stereotype Threat? American Association of University Women
- ReducingStereotypeThreat.org
- The Science Behind Implicit Bias, American Association of University Women
- Unconscious Bias and Why It Matters, NCWIT
- What is Unconscious Bias, How to Combat Unconscious Bias as a Leader in Your Organization, and How to Combat Unconscious Bias as an Individual, Catalyst, infographics

OTHER RESOURCES

Women in STEM Book Recommendations:

The following books can serve as resources for women in the STEM workforce.

- Boots on the Ground, Flats in the Boardroom: Transportation Women Tell Their Stories by Grace Curnican (WTS panel and discussion on the book)
- Blindspot: Hidden Biases of Good People by Mahzarin Banaji and Anthony Greenwald: Explores hidden biases that we all carry from a lifetime of experiences and a method called the Implicit Association Test (IAT) to detect the hidden contents of the mind
- Confidence Code: The Science and Art of Self-Assurance – What Women Should Know by Katty Kay and Claire Shipman: Authors deconstruct this essential, elusive, and misunderstood quality and offer a blueprint to bring more of it into our lives
- Rock Your Moxie by Maureen Berkner-Boyt: A guide to success and leadership for women

LGBTQI Workplace Resources

These organizational sites and resources are specifically focused on the Lesbian, Gay, Bisexual, Transgender, Queer or Questioning, and Intersex (LGBTQI) diversity and inclusivity in the workplace.

- Corporate Equality Index, Human Rights Campaign: National benchmarking tool on corporate policies and practices pertinent to lesbian, gay, bisexual and transgender employees
- Lesbians Who Tech: A community of queer women in or around tech industries
- LGBTQI, Catalyst: A resources on LGBTQI inclusion in the workplace
- Out and Equal: Advocates for LGBT workplace equality and inclusion
- Out in the World, Center for Talent Innovation: Infographic and facts on LGBT rights in the global marketplace
- The Power of Out 2.0: LGBT in the Workplace, Center for Talent Innovation: Key findings on the benefits of a truly inclusive workplace to both employers and employees
- RANGE Consulting, The Center: Services to expand diversity and inclusiveness related to LGBT employees in Colorado
- Trans*H4CK: Builds technology for trans and gender-non-conforming people, and incubator that has launched careers and start-ups

Other Women and STEM Organizations and Resources

These sites and resources relate to gender equity in STEM and the workplace.

- Association for Women in Science: Dedicated to achieving equity and full participation of women in all STEM disciplines and across all employment sectors
- BuildUp: Mentors, educates, connects underrepresented entrepreneurs in technology)
- CODE2040: Creates pathways to educational, professional, and entrepreneurial success in technology for blacks and Latino/as)

OTHER RESOURCES

- Digital Undivided: Providing high-potential black and Latina women entrepreneurs with the network, coaching, and funding to build and scale their companies
- The Business Case for Diversity, Engineering, Inc. January/February 2015
- Girl Develop IT: Affordable programs for adult women interested in learning web and software development
- Glass Hammer: Career resource for women
- International Women's Day: EY resources for companies on gender parity
- Leadership Investment: Based in Colorado – connections, resources, community learning and solutions on gender-balanced leadership in the workplace
- Lean In: Committed to offering women the ongoing inspiration and support to help them achieve their goals: community, education, circles
- Mercer, with report on women in the workplace: Consulting and other services for companies
- Military Pathway to IT and Computing Careers, NCWIT: Connect students' interests with opportunities in IT and computing that can be achieved through military service and beyond
- Million Women Mentors: Supports the engagement of one million STEM mentors (male and female) to increase the interest and confidence of girls and women to persist and succeed in STEM programs and careers
- Moxie Exchange Movement: Programs and services to help companies recruit and retain the best female talent
- National Action Council for Minorities in Engineering: Catalyst to increase the proportion of African American, American Indian, and Latino young women and men in STEM careers
- National Girls Collaborative Project: Statistics: State of girls and women in STEM)
- National Science Foundation's ADVANCE: Increasing the participation and advancement of "women in academic science and engineering careers
- Power to Fly: Platform for hiring gender diverse teams
- Tech Inclusion: Tech inclusive impact of organizations; conferences, summits, consulting services and training
- V-WISE: Veteran Women Igniting the Spirit of Entrepreneurship: Training and resources for entrepreneurs
- Women's Veteran Mentoring Program: American Corporate Partners: Connecting US Veterans to business leaders through mentorships and online career advice
- Women in Engineering Proactive Network (WEPAN): Dedicated to advancing cultures of inclusion and diversity in engineering higher education and workplaces
- Women in Technology: The Clayman Institute for Gender Research: Research to increase the role women play in the development and use of technology
- Women Who Tech: Championing women in technology and startups

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THE WOMEN'S FOUNDATION OF COLORADO

YOU CAN FIND THIS REPORT ONLINE AT: WWW.WFCO.ORG/STEM