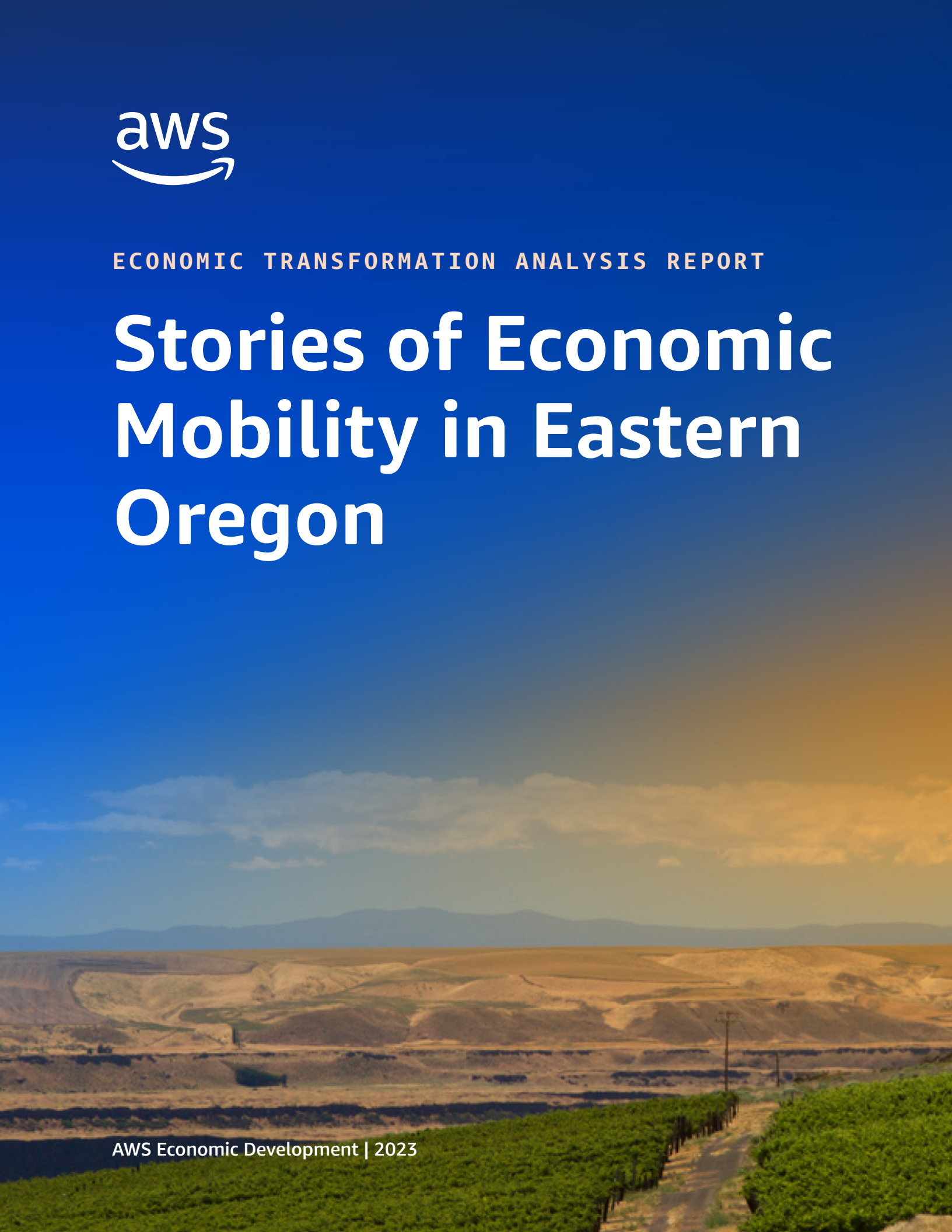
ECONOMIC TRANSFORMATION ANALYSIS REPORT

Stories of Economic Mobility in Eastern Oregon



AWS Economic Development | 2023

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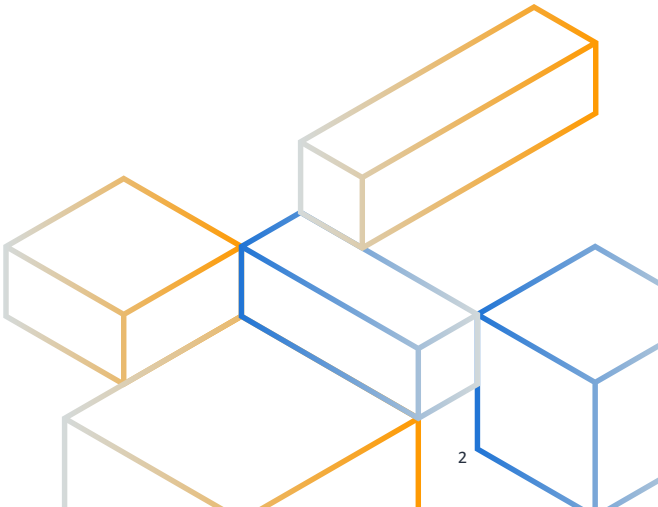


Executive Summary

The accessibility of skilled technical jobs related to cloud infrastructure can be transformative for rural communities, families, and individuals. This report provides an economic transformation analysis (ETA), examining how AWS's data center investments have impacted skilled technical workers and their long-term economic prospects in eastern Oregon, where AWS has operated data centers since 2011.

More than 5,000 workers at AWS and a variety of external businesses currently support data center construction, connection, operation, and maintenance. This workforce includes data center technicians, engineers, electricians, mechanics, construction workers, security guards, and heating, ventilation, and air conditioning (HVAC) technicians. The report highlights how AWS's infrastructure investments have ripple effects, which catalyze economic opportunities and mobility for individuals and the broader community.

Introduction

Cloud computing is today's backbone of digital innovation, enabling people to connect with friends and family; work remotely; shop online; stream movies, TV shows, music, and video games; and experiment with new technologies. The success of cloud computing relies on data centers, which are facilities that house information technology (IT) infrastructure. The efficient construction, connection, operation, and maintenance of data centers necessitates a skilled workforce for technical jobs. These skilled technical jobs can be accessible with some training, but don't always require a bachelor's degree.[1]

[1] https://nap.nationalacademies.org/catalog/23472/building-americas-skilled-technical-workforce
https://www.nsf.gov/nsb/publications/2019/nsb201923.pdf

The availability of cloud infrastructure-related technical jobs can unlock transformative opportunities in rural communities. These skilled tech jobs offer hands-on tech career opportunities beyond traditionally recognized tech professions in urban settings. The demand for cloud computing has also increased the demand for these types of jobs, which in turn can enable family-sustaining careers.[2] According to the World Bank, economic transformation[3] involves changing the nature of jobs, where people work, what they do, and how they do it. AWS's investments in data centers have increased the demand for, and accessibility of, skilled technical jobs, unlocking long-term economic opportunities.

In eastern Oregon, where AWS has been operating data centers since 2011, the current workforce supporting data center construction and operation includes more than 5,000 local workers at AWS and a variety of external businesses. These jobs, ranging from security guards and construction workers to electricians and HVAC technicians, continue to diversify employment opportunities on the back of a strong agriculture economy.

[2] This report follows the Brookings definition of family-sustaining careers: https://www.brookings.edu/essay/how-family-sustaining-jobs-can-power-an-inclusive-recovery-in-americas-cities/
[3] https://ida.worldbank.org/en/topics/theme/jobs-and-economic-transformation

Photography by Mario Sepulveda Films

Stories of Economic Mobility

Ray's Wage Growth Story

Ray is a Hermiston native who found his way back to eastern Oregon after moving away at a young age.

"I was born in Hermiston, but I moved to Arizona when I was four years old," said Ray After my parents divorced when I was seven years old, we moved back. After completing high school, I returned to Arizona where I completed my entry-level certifications in technical support, networking, and IT operations and infrastructure. I came back to Hermiston to get married to my high school girlfriend. Before joining AWS, I was working for a local retail chain here in town. After seven years on the job, I went from getting paid $10 to just $13 per hour."

In 2016, Ray joined AWS as a data center technician on a temporary contract starting at $20 per hour. Ray progressively advanced his career to a full-time data center operations technician, and he received coaching through an internal program to become a manager. At the end of 2020, he was promoted to manager of data center operations. Ray's career trajectory has resulted in him nearly tripling his annual earnings.

According to the Massachusetts Institute of Technology (MIT) Living Wage Calculator, Ray's current wage is 59% higher than the wage needed to support himself and his family in Umatilla County. Figure 1 illustrates Ray's wage growth story through his career progression as a data center employee.

Figure 1: Ray's Wage Growth Story

Ray's hard work improved his family's quality of life and enables him to provide access to better opportunities for his children.

Ray shared that there was not a lot of income growth before AWS, but that changed once he started his data center career.

"We were able to buy a house last summer, and since I'm working for AWS, I am able to afford to pay a private therapist for members of our family who needed long-term healthcare support," said Ray. "This job has helped break generational curses for my kids. I am living in a brand-new development, we could make choices for our family that we didn't have access to before, and although I did not qualify for paid paternity leave for our last child, I do for our next. This job with AWS allows for all of this to happen."

The Impact of Parental Leave and Work-Family Balance on Children's Outcomes

Parental leave has been shown to have significant benefits for children's economic outcomes. Research suggests that parental leave can promote early childhood development, improve educational outcomes, and increase earnings potential in adulthood. One study found lasting favorable effects of paid maternity leave.[4] Another study shows that parental leave is associated with higher rates of college attendance and graduation as well as increased earnings in adulthood. These findings suggest that parental leave can have a positive impact on children's economic outcomes by promoting their early development and setting them on a path toward greater success later in life.[5]

[4] https://www.nature.com/articles/s41599-022-01340-z
[5] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3207253/

Higher wages can lead to a beneficial cycle of advancement for individuals, families, and communities. Ray hopes that others in his community can also benefit from similar career opportunities. At the end of 2021, AWS data centers in eastern Oregon directly employed 937 regular full-time employees. These jobs paid a median annual salary of $74,000 or more, exceeding the median household income in the area by more than $12,000.

The earning potential for high-demand skilled technical jobs increases with level of experience and career progression. AWS is committed to making these family-sustaining jobs accessible to eastern Oregonians. Figure 2 provides examples of some of these in-demand jobs.

Figure 2: In-Demand Jobs Related to Data Centers

Photography by Mario Sepulveda Films

Uppa's Path to Changing Careers

Uppa was raising her two young daughters and working as a certified nursing assistant (CNA) to support her family when she heard about the Data Center Technician Training Program at Blue Mountain Community College (BMCC).

She moved to Oregon with her husband from Kathmandu, Nepal, nearly 13 years ago. She found the program's part-time structure helpful, as it allowed her to keep her day job while studying.

"I have always wanted to work in technology, but I didn't have a background in it," she said. "The first month of the program was challenging, because I didn't have the experience, but I never gave up. I just kept telling myself that I was going to finish it."

> **"I worked as a CNA for two years in a hospital and senior care center, but I wasn't satisfied with my income. I also had a hard time balancing work and family life due to inconsistent work hours and schedule."**
>
> **Uppa,**
> **Hermiston, Oregon**

Uppa's determination paid off. After a few months, she became more confident, and—like the majority of students that complete the program—she had already secured a role in an AWS data center before graduating. The first week of orientation in the data center was exciting.

"I was the only woman in my cohort, and this was a totally different field for me," said Uppa. "With no previous background in IT, I thought I was not going to be able to make it. The mentor I was assigned to was really patient, and I soon started building both my skills and confidence. The BMCC program taught us the basics about computers, servers, security, and networking. I've been expanding that knowledge at work ever since. The field is changing so fast. You are constantly learning new things. It's not like other jobs where you might do the same tasks every day."

For Uppa, the opportunities the program brings are endless (Figure 3). "There's so much scope to switch careers within AWS—so many opportunities to develop, and so many available learning resources. Someone is always there to help if you have questions or run into issues," she said.

Uppa is now a lead for data center operations managing a team and mentoring new hires, including other women. She encourages them to get out of their comfort zone and ask a lot of questions. But she isn't going to stop there.

"Being a lead made me realize that I really enjoy working with people, and I'm now working toward a management role," said Uppa. "I also tell my daughters a lot of stories from work, about my successes and my challenges. I want them to know that they can be strong and pursue their ambitions, no matter what."

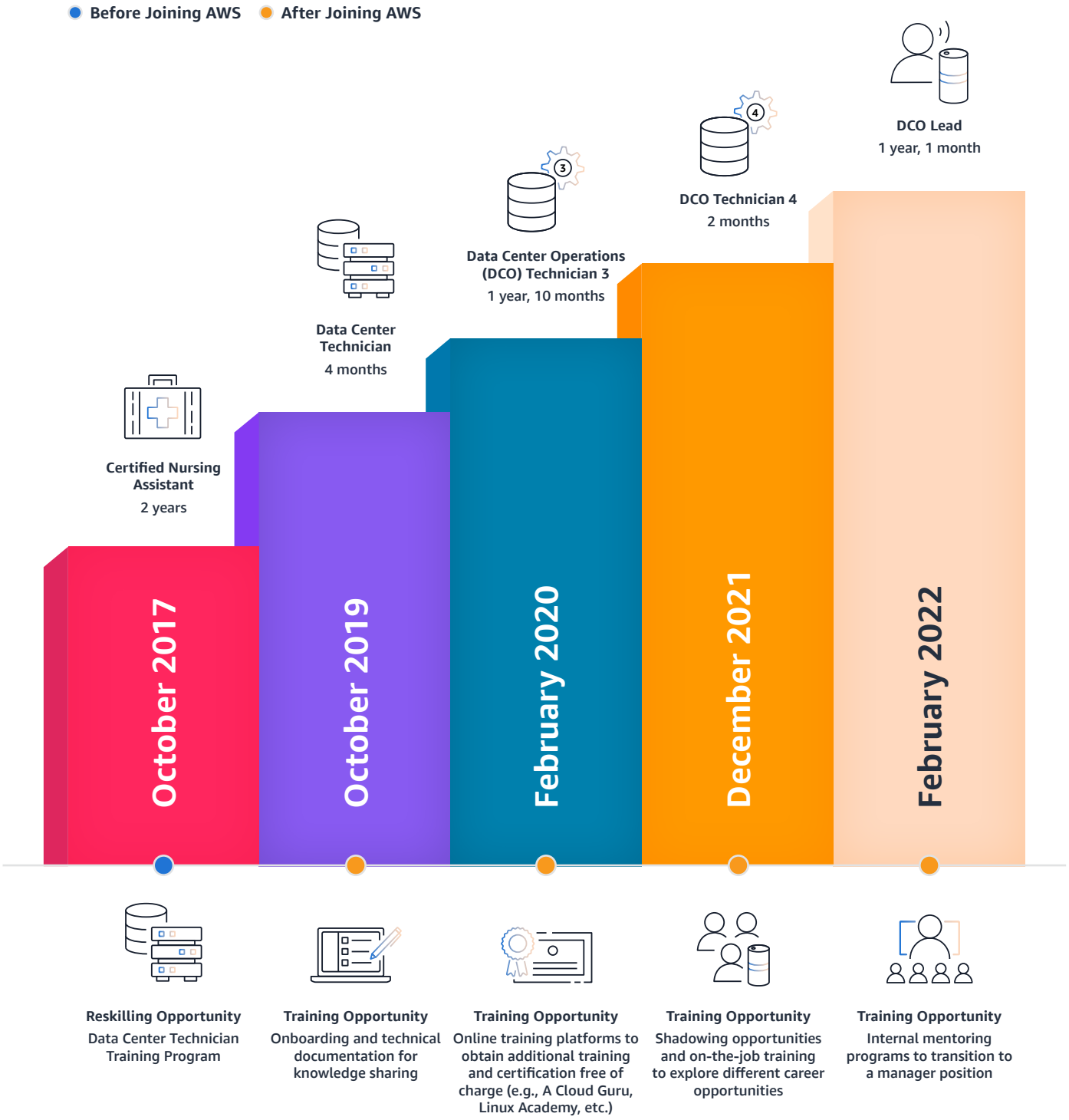
Uppa's daughters have participated in AWS Think Big Spaces, which are labs designed to provide a place beyond the classroom for students to explore and cultivate an interest in science, technology, engineering, arts, and math (STEAM) disciplines.

The Impact of Peer Mentors and Role Models in STEAM Careers for Women

The shortage of skilled workers is exacerbated by the underrepresentation of women and racial ethnic minorities.[6] Same-gender peer mentoring increases confidence and retention of women in STEAM while promoting their career aspirations.[7] The more women interested and working in STEAM, the more they can also serve as role models for the next generation. Girls who know a woman in a STEAM profession are substantially more likely to feel empowered when they engage in STEAM activities (61%) than those who don't (44%).[8] Ultimately, the presence of peer-mentors and role models can help increase diversity, representation, and gainful employment in STEAM fields for women.[9]

[6] https://www.uschamberfoundation.org/blog/post/addressing-stem-workforce-shortage
[7] https://www.pnas.org/doi/10.1073/pnas.1613117114
[8] https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RE1UMWz
[9] https://www.brookings.edu/blog/the-avenue/2020/09/09/the-labor-market-doesnt-have-a-skills-gap-it-has-an-opportunity-gap/

Figure 3: Uppa's Path to Career Change



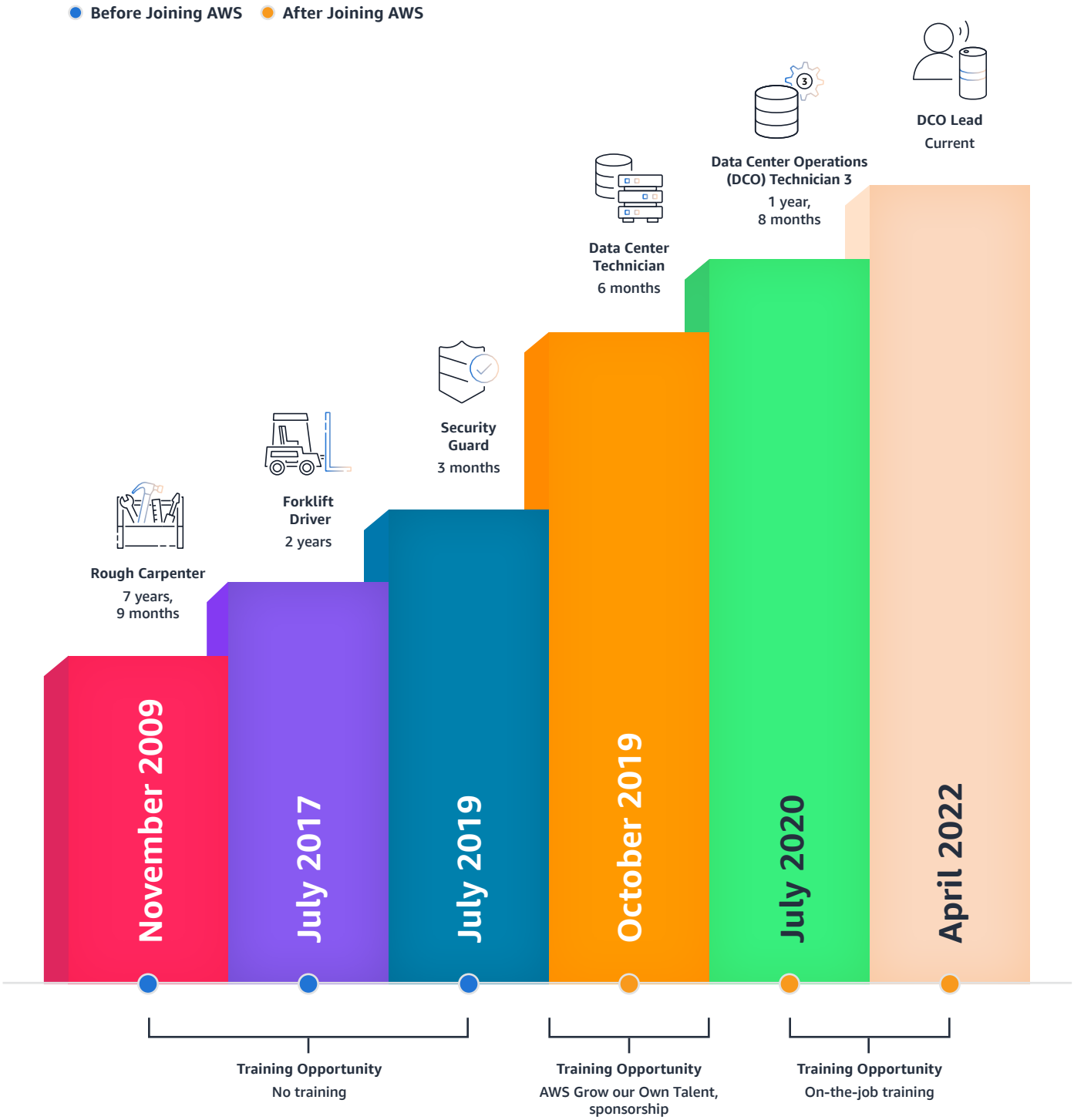
Photography by Mario Sepulveda Films

Ben’s Experience With On-the-Job Training

Ben has lived his entire life in Hermiston. Growing up, he had a passion for fixing computers, but his first jobs were as a construction worker and later a forklift driver. In 2020, Ben became aware of data centers and was curious to learn more about what opportunities they could afford for workers like him. Ben decided to take a pay cut and was hired by a local contracting company as a security guard for a data center. While working as a contractor, he learned about the AWS’ Grow Our Own Talent program, which provides paid on-the-job training for workers with nontraditional backgrounds and experience.

The program enabled Ben to transition into an entry-level data center technician role in an AWS data center and ultimately make a career pursuing his passion for fixing computers (Figure 4). Ben is now an experienced, skilled technical worker responsible for operating and maintaining specialized equipment at an AWS data center facility in Umatilla County. In less than three years working in a data center, Ben’s annual income has more than doubled.

Figure 4: Ben's Career-Development Trajectory



Ben's career progression at the data center, enabled by ongoing training opportunities, has had a significant impact on him and his family.

"When I started working as a data center employee, I found myself more and more able to significantly contribute to my family," said Ben. "I can pay for entire family trips and help support my kids and ex-wife more than I ever could before. My son and youngest daughter are now able to concentrate on school instead of having to get a job to pay for their extracurricular expenses. Working with AWS has been the single best thing in our lives, both monetarily and otherwise."

The Role of Tailored Training Programs in Accessing Quality Jobs

Sectoral employment programs train job seekers for high-quality employment, or employment in specific industries considered to have strong labor demand and opportunities for career growth. They offer a promising pathway to higher-wage jobs for workers who may face barriers to employment, typically those without college degrees.[10] Multiple evaluations of sectoral employment programs, including on-the-job training, have demonstrated substantial, positive results for participants, with earnings gains (11%–40%) among the largest found in any evaluation of a U.S. training and employment services program.[11]

[10] https://www.povertyactionlab.org/sites/default/files/publication/Evidence-Review_Sectoral-Employment_2222022_0.pdf
https://www.brookings.edu/research/do-sectoral-training-programs-work-what-the-evidence-on-project-quest-and-year-up-really-shows/

[11] Lawrence F. Katz & Jonathan Roth & Richard Hendra & Kelsey Schaberg, 2022. "Why Do Sectoral Employment Programs Work? Lessons from WorkAdvance," *Journal of Labor Economics*, vol 40(S1), pages S249-S291.

Photography by Mario Sepulveda Films

Clint's Journey to Staying Local

Clint, born and raised in Boardman, Oregon, shared that a 20-minute drive to Hermiston in Umatilla County is a big move. At 19, he decided that college wasn't the right path for him and instead seized the opportunity to work at the Umatilla Chemical Depot.

After dedicating 12 years of his life to the depot, Clint faced a significant decision in 2013—should he follow his job and relocate to Colorado or reenter the local job market? He tried various jobs in his local area, including working for an agriculture cooperative, a craft beer tap house, a beer magazine as a subcontractor, and a brewery.

> **"I wanted to stay local because all of my and my wife's family are here in eastern Oregon. I grew up here, I appreciate the eastern Oregon environment, and I want to stick with it."**
>
> **Clint,**
> **Boardman, Oregon**

Clint had a chance encounter with an AWS employee at a local restaurant. During their conversation, Clint's interest in AWS was sparked, prompting him to inquire further. In 2017, Clint began his journey with AWS as a cable engineer through a contracting company, which enabled him to stay in his community. After working in that role for three years, he became a full-time AWS employee in data center operations. Clint earned a promotion to a manager position through an internal coaching program (Figure 4). Since joining AWS as a contractor more than five years ago, Clint's income has quadrupled.

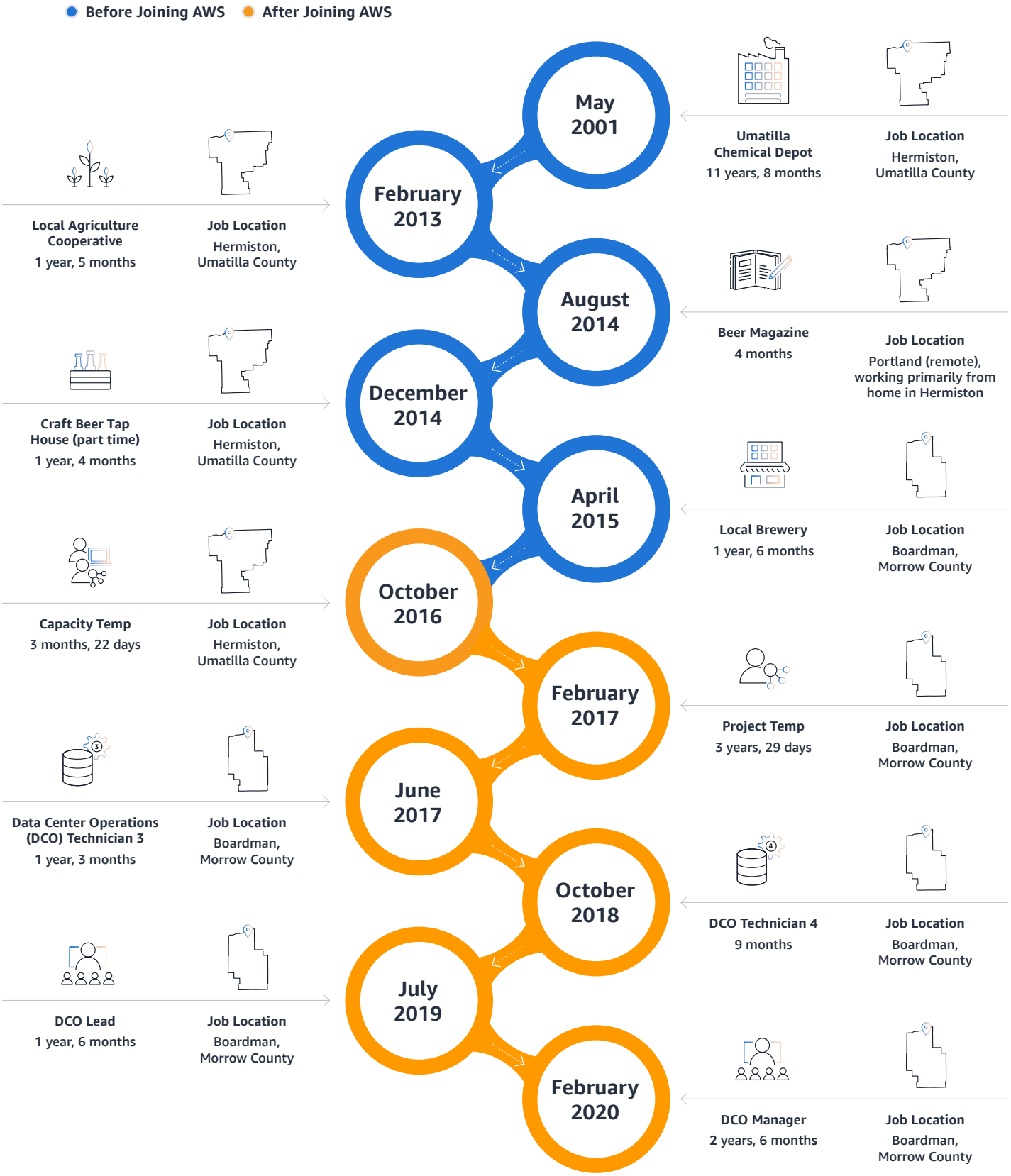
"I was definitely looking at the big picture and seeking more stable employment," said Clint. "Now, I have the option to turn my current job into a lifelong career and potentially retire at AWS someday. Thanks to AWS, I can have a job that allows me to stay local and work for a company that provides the stability I was looking for."

Impact of Employment Opportunities on Community Retention

Employment has been shown to have a significant impact on rural community development in the United States. Families on small to mid-sized farms often depend on nonagricultural jobs in their local economies as off-farm sources of income.[12] Research by the United States Department of Agriculture (USDA) Economic Research Service finds that rural counties with lower unemployment rates experience higher levels of income growth and lower levels of poverty.[13] Furthermore, sustainable employment opportunities in rural communities can promote economic opportunity, population growth, and a more diverse and vibrant community.[14] Additionally, job creation in rural areas can lead to the development of supporting industries and infrastructure, further stimulating economic growth.[15]

[12] https://www.ers.usda.gov/webdocs/publications/105155/eib-246.pdf?v=7020.8
[13] https://www.ers.usda.gov/topics/rural-economy-population/rural-poverty-well-being/
https://www.ers.usda.gov/amber-waves/2022/february/persistently-poor-rural-counties-experienced-lower-employment-impacts-from-the-coronavirus-covid-19-pandemic-but-have-higher-cumulative-covid-19-case-rates/
https://www.census.gov/library/stories/2018/12/differences-in-income-growth-across-united-states-counties.html
[14] https://www.ers.usda.gov/webdocs/publications/45361/52906_err185.pdf?v=0
https://research.upjohn.org/cgi/viewcontent.cgi?article=1020&context=up_policypapers
[15] https://www.mckinsey.com/industries/public-and-social-sector/our-insights/rural-rising-economic-development-strategies-for-americas-heartland
https://www.conference-board.org/pdfdownload.cfm?masterProductID=39541

Figure 5: Clint's Journey to Staying Local



Scaling Pathways to Prosperity

Working with local collaborators, AWS is dedicated to creating scalable pathways to prosperity for the diverse local community through workforce development programs.

Torrie Griggs, the executive director for Boardman's Chamber of Commerce, said, "We truly believe in the grow-our-own theory."

Through a talent life-cycle approach, AWS's programs meet current and potentially future employees where they are in their journey. The programs include training, upskilling, and reskilling opportunities to enable job seekers like Ray, Uppa, Ben, and Clint to land a data center job and develop long-term careers. In parallel, AWS provides STEAM experiential learning and training opportunities for future generations of eastern Oregonians. These opportunities include classes and workshops starting at the middle school level and continuing through high school and beyond.

Training and Reskilling Opportunities for Job Seekers

AWS, in collaboration with BMCC, provides a number of training and reskilling pathways (Figure 6) to data center jobs for local workers in eastern Oregon. The Data Center Technician, Industrial Systems Technology, and AWS Grow Our Own Talent programs provide technical classes, internships, and paid on-the-job training to help local workers transition to a data center technician or engineering operations role.

Figure 6: Tailored Workforce Development Programs for Data Center Jobs

Programs Developed/ Supported by AWS	Local Organization	Target Audience	Opportunity
AWS Grow Our Own Talent	AWS on-the job-training and BMCC	The program is open to people with little or no directly relevant work experience, and no college degree is required.	The program helps individuals with nontraditional experience and backgrounds develop skills in data center roles through a combination of paid on-the-job training for up to three months and placement opportunities (e.g., data center technicians, engineering operations technicians).
Data Center Technician Training	BMCC	The program is open to anyone, regardless of their background or skills, and prepares them for employment in data centers and the broader IT sector.	A one-year upskilling certificate program created by AWS and BMCC to prepare technicians to work on installing, maintaining, and repairing computer and network systems.
Fiber Optic Fusion Splicing Training	BMCC	The course is designed for anyone who wants to enter the fiber optic industry and professionals who want to learn the fusion splicing skill.	A two-day no-cost course for students to learn how to install and repair fiber optics. The program offers a career networking session to meet local employers.
Industrial Systems Technology	BMCC	Prepares students for a rewarding and challenging career related to insulation, repair, and maintenance of a wide range of industrial machinery and systems including those in data centers.	The program offers courses with hands-on training at BMCC's Workforce Training Center in Boardman, Oregon.

AWS has worked with local educators to ensure the alignment of these training programs with industry standards. Additionally, AWS provided BMCC with a $150,000 grant to purchase lab and training equipment in order to serve more students.

From 2020 through 2022, a total of 354 workers have participated in the AWS Grow Our Own Talent program in eastern Oregon, and 278 workers (nearly 80% of total participants) have been hired by AWS to date.

According to Peter Hernberg, a teacher at BMCC, around 12 students complete the Data Center Technician Training Program each year, and more than 90% of them find an entry-level data center role.

“AWS is willing to give people a chance to enter the data center career path,” said Hernberg. “The bar for giving students a try for three or six months is reachable with basic skills, and that’s a good way to give students opportunities.”

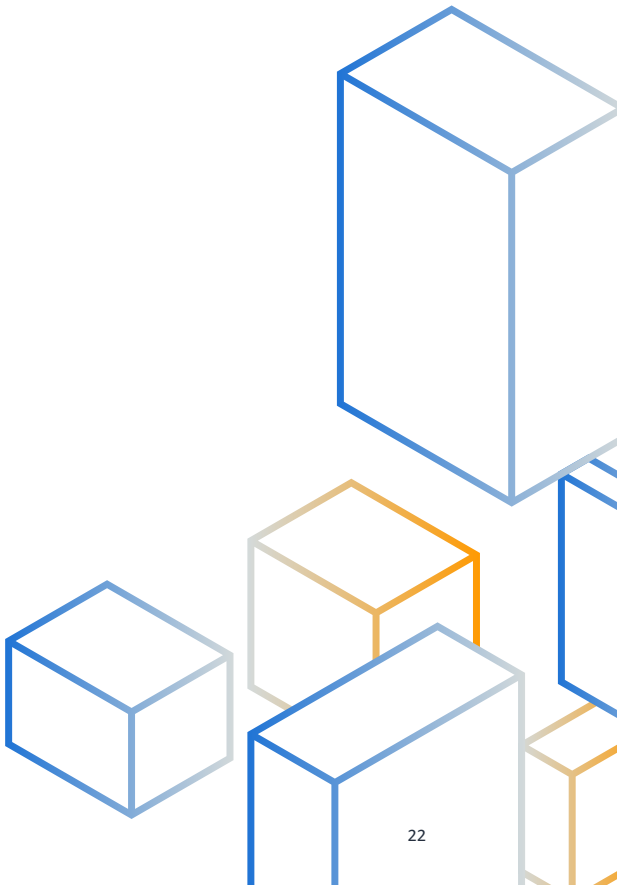
AWS contributes $100,000 annually in scholarships for local students enrolled in the BMCC data center–related programs. A scholarship allows a student to focus on academics and gives them the option to complete the program on a part-time basis. Hernberg said that AWS’s scholarship support has empowered students to launch careers regardless of whether they pursue employment with AWS, which would not have been possible without this financial support.

"There is no magic here," said Hernberg. "It is simply that AWS is hiring a lot in this community, and AWS is hiring my students every year."

In addition to established programs that provide semester-long education for the data center industry, AWS hosts AWS Fiber Optic Fusion Splicing Certificate Course programs at BMCC. In 2022, two workshops attracted a total of 55 learners and seven employers in eastern Oregon. These trainings are important because they equip local workers with certified technical skills that can open doors to technical entry-level jobs with other businesses in the area and make the learners more competitive in the labor market. A growing number of people who have already worked in the field use the training as an upskilling opportunity. Participation in this hands-on training results in an increased ability to take on more complex jobs with employers. For instance, Team Fishel, which specializes in utility engineering, construction, and network installation services, has hired graduates directly out of the fusion splicing program.

Craig Mathes, the vice president of Safety and Human Resources at Team Fishel, said, "The opportunity to collaborate with AWS in the area of career development is attracting more people to the field and these types of careers. Team Fishel has hired a number of our teammates through these workshops. Participation in the workshops has led to faster onboarding. The hands-on trainings help individuals seeking an exciting, well-paying career get a head start."

In the words of Umatilla County Commissioner Dan Dorran, "Our youth is our biggest asset when it comes to workforce development. If we can retain 20% of the kids in the community, then we can have a self-sustaining workforce. Identifying progressive types of opportunities, such as the fusion splicing program, makes me smile ear to ear."



Experiential Learning Opportunities for K–12

In collaboration with local entities and school districts, AWS provides a number of diverse programs for local middle and high school students (Figure 7). These programs provide targeted training in STEAM topics through experiential learning opportunities as well as exposure to STEAM careers for the future eastern Oregonian workforce.

Figure 7: Experiential STEAM Learning Opportunities and Career Awareness Programs

Programs	Local Organization	Target Audience	Opportunity
AWS CloudRoom	Local schools	Students ages 9–14	Provides students with learning experiences focused on the cloud and emerging cloud technologies.
Girls' Tech Day	Morrow County School District, Hermiston School District, Umatilla School District, Confederated Tribes of Umatilla Indian Reservation (CTUIR)	High school students	Educates, inspires, and empowers girls and young women ages 8 through 24 to pursue careers in technology.
Think Big Spaces	Morrow County School District, Hermiston School District, Umatilla School District, CTUIR	Elementary, middle, and high school students	Provides a place beyond the standard classroom for students to explore and cultivate an interest in STEAM topics and STEAM-related careers. These labs encourage a hands-on approach where students think big to solve real-world problems.
We Build It Better	Local schools	Middle and high school students	An all-inclusive 18-week, industry-designed, educator-developed, curricular experience that engages students in a work-like STEAM environment.

The We Build It Better program, which helps middle school students gain exposure to a work-like STEAM environment through an 18-week workshop, has served over 1,200 students across seven local schools in eastern Oregon. AWS invests about $200 for each student by purchasing materials and organizing the workshops. The program helps shape students and teaches outcomes in four areas: 1) soft skills development (teamwork, creativity, etc.), 2) STEAM technical skill development, 3) shaping career aspirations, and 4) teacher support and development.

One middle school student shared that they're excited to have a class that they find engaging and said, "We learn skills that will help us later in life."

Teachers value the diverse lessons that teach applicable real-life skills. Students at the middle school level are provided an opportunity to get a taste of what they could do in their future career paths or potential focus areas at the high school level.

A teacher at Armand Larive Middle School in Hermiston said they have been impressed with the We Build It Better program's curriculum and that their students are engaged and excited. The idea of having a class that doesn't penalize them for making mistakes is exciting for the kids and teachers. The teacher also spoke about how the program makes critical STEAM skills accessible to students.

Other programs, like AWS Cloud Room, AWS Think Big Spaces, and AWS Girls' Tech Day, served more than 4,300 eastern Oregon students via 27,300 interactions from 2022 through the first quarter of 2023. These programs inspire and prepare future-ready students as they develop into well-rounded and creative problem solvers.

AWS also supports existing STEAM focused programs in the community such as the Umatilla Robotics team. Heidi Sipe, superintendent of the Umatilla School District, said, "The way AWS supports the robotics team, that's ideal. When the robotics team needs something, they ask. AWS provided $9,000 in travel funding plus T-shirt branding for our team to attend the world finals.

Building the Future Together

The demand for skilled technical jobs supporting data centers can be transformative for rural communities, offering career opportunities that open pathways for economic mobility for individuals and families in Morrow and Umatilla counties. Many of these jobs are attainable with a few weeks of training. They do not require completing a college degree and taking on the related onerous student debt. In collaboration with local businesses, AWS will continue to invest in the regional economy to catalyze inclusive and long-term economic transformation, for generations to come, through tailored education, training, and reskilling opportunities to build the future together.

Learn More and Join the Journey

Many pathways to economic opportunity and mobility are available through skilled technical jobs related to data centers. Learn more and join the journey to building a more prosperous future together:

- Blue Mountain Community College – Data Center Technician Program
- Blue Mountain Community College – Industrial Systems Technology Data Center Operations
- AWS' Grow Our Own Talent – Work Based Learning and AWS Internships


aws