

COLORADO BUSINESS REVIEW

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In this Issue: Colorado Engineers begins on this page. Real-World Experiences begins on page 4. EKS&H in Colorado on page 5. On page 6, Colorado's Advanced Industries. Startup Value Survey is on page 8. Summary of PBS begins on page 9.

Photo courtesy of Alfred Benesch & Company.

The Colorado Engineering Profession: **Colorado Engineers—the Problem Solvers**

Mark Hamouz

Early Years of Engineering in Colorado

Prior to achieving statehood in 1876, it was known that Colorado was a significant source of surface water that flowed into numerous territories and states west of the Mississippi River. Water was the reason that the Office of the State Engineer was created in 1881 to formally measure the daily water flow in each stream from which water was diverted to canals for irrigation; monitor and forecast years of droughts; provide opinions on locations of potential reservoirs for future water storage; and record the use of water by the agricultural industry.

The state engineer prepared a report every two years, but unfortunately the original two reports, 1881–82 and 1883–84, are not available. However, the report of 1885–86 by the state engineer, E.S. Nettleton, to the governor,

Benjamin H. Eaton, provides a historical snapshot of the status of Colorado's water resources for those two years.

The chapters of this report are:

1. The 34 Colorado Water Districts Reports: includes the recording of the daily flows of the major rivers, creeks, canals, and ditches.
2. Seepage Studies: of several major rivers and canals.
3. "Wanted—More Farmers": more water supply than demand existed at the time.
4. Fruit Growing in Colorado: a report of irrigation usage of the agriculture industry.
5. Reservoirs: the study of potential locations for water storage if needed in the future.
6. The Conservation of Water by State Control: 1886 was a dry year; however, concern existed about future water needs even though enough water was still available for the current usage that year.

7. Appendix: a report on the design and construction of a multispan bridge over the Grand River (now named the Colorado River) at Grand Junction. Total cost: \$44,930.96, funded by a bill from the Colorado Legislature.

By the time of the 1895–96 state engineer's report, the number of water districts had increased and a division engineer was now supervising the water commission in each district to oversee the irrigation demands from each major river. Additionally, the design and construction of bridges and roads greatly increased and were covered in this report. According to the procedures of that time, each

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THE PROBLEM SOLVERS, CONTINUED FROM PAGE 1

From the Editor

The Professional and Business Services (PBS) Supersector has the third-largest share (15.8%) of Colorado's employment, accounts for 14% of the state's GDP, and impacts nearly every industry and company in the state of Colorado. Companies in this sector provide a wide variety of business services, ranging from accounting and legal, to architectural and computer systems design.

The articles in this issue of the *CBR* highlight services provided by Colorado companies working in PBS as well as where the industry is headed.

Our next issue will review Colorado's economy six months into the year. Look for it in your inbox this summer.

Please contact me with any comments at 303-492-1147.

Richard Wobbekind

bridge and road project had to be funded by individual bills passed by the Colorado Legislature.

Eventually, the increasing population, with its demand for more goods and service and the growth of automobile technology, led to the Colorado Highway Commission being established on January 1, 1910. Formed to develop the first state primary highway system to organize and connect the mishmash of existing private and toll roads, this commission eventually morphed into the Colorado Department of Highways and now exists as the Colorado Department of Transportation (CDOT). Since then, other Colorado engineering departments were established as the population grew and more specific demands were made on the infrastructure. Currently, these agencies include the Colorado Department of Public Health and Environment (CDPHE) and the Colorado Department of Natural Resources, which now includes the Colorado Division of Water Resources, previously known as the Office of the State Engineer.

Some Statistics

The Bureau of Labor Statistics reported the number of employees working for private engineering firms peaked in 2008, at 32,998, and declined with the recession. Starting in 2011, this number started to increase again, to 31,380 employees, by 2012. The average annual salary of all engineering employees in 2012 was reported at \$97,800, and the engineering profession contributed \$3.1 billion in wages to Colorado's economy in 2012. The vast majority of engineering firms are classified as small businesses, and the American Council of Engineering Companies of Colorado (ACEC-CO) reported that 30 or fewer employees comprised close to 75% of its member engineering firms. About 60% of its member firms are employee owned.

Engineers in Colorado are employed by both the private and public sector. Private-sector engineering companies provide services for numerous clients, including municipal, county, state, and federal agencies; industrial and manufacturing companies; airports, railroads, shipping, and other transportation hauling companies; residential and commercial developers that need design services for retail, hotel, and related tourism industries; agricultural and farming industries; water supply, distribution, and waste treatment; and many others. On the other hand, most engineering firms outsource legal; accounting; reproduction; human resources; retirement financial planning; and educational opportunities for both the companies and employees.

Almost all engineering design projects are a type of public/private teaming in execution. For projects that

are owned and funded by a public agency such as the Denver International Airport and the Denver Convention Center, the project is funded and administered by the public agency, and the design—from conceptual to final to construction phase—is accomplished by engineering companies in the private sector. The selection of the private engineering companies for engineering design projects is very competitive through the use of the qualifications-based selection (QBS) process. Other more notable engineering design projects over the last 50 years are the I-70 through Glenwood Canyon; the 16th Street Mall; the RTD Light Rail Corridors; the NORAD Complex; Coors Field; the Pepsi Center; Mile High Stadium; the US Air Force Academy; the Fitzsimons closure and conversion; the Rocky Flats cleanup; Vail Village redevelopment; Grand Mesa Roads; Dillon, Chatfield, Cherry Creek, and Bear Creek reservoirs; the Eisenhower and Johnson tunnels; and the Lowry and Stapleton redevelopments.

A Team Effort in Response to the Flood of September 2013

The tragic consequences of the September 2013 floods in Colorado affected people's lives, their survival, their property, and their communities—from the mountain towns all the way to the border at Julesburg. The National Guard was first engaged to rescue people and to keep travelers away from damaged roads and bridges to prevent further loss of life. The day after the rains stopped, the first work performed was to send crews from the CDOT, the National Guard, and private engineers to inspect and evaluate bridges and roads. Soon after this inspection work commenced, the CDOT met with highway contractors to begin the process of rebuilding. The combined response of Colorado's public and private engineers and contractors was so dynamic that the last of the 27 state roads and associated bridges damaged or destroyed by the floods were reopened a week earlier than the set deadline of December 1, 2013. The efforts put in by managers, inspectors, and contractors was monumental; crews worked every day for weeks and months. Permanent recovery and rebuilding of the state roads and bridges are just beginning to be performed.

The impacts of the flood to the infrastructure of the communities and counties, including Jefferson, Boulder, Larimer, Weld, Morgan, Logan, and Sedgwick, were just as devastating. The damage and destruction ranged from people's homes and property and the bridges and roads linking communities to oil and gas operations and crops. The rebuilding of homes and property, along with property and infrastructure in counties and communities, is expected to take many years.



Photo courtesy of Alfred Benesch & Company.

You can't—drive to work, walk the dog, cook that pot roast, bake the cake, shower after jogging, watch “60 Minutes,” toast the bread, brew the coffee, mow the lawn, call your mother, be cool in the summer, wash your sweat suit, dine out, play computer games, medicate your cold, build your new house, listen to ‘ol’ blue eyes,’ ride your bike, videotape that wedding, vacuum the rug, recycle your garbage, play baseball at night, be warm in the winter, fly to Hawaii, check the time, flush the toilet, buy a fresh tomato in winter, fill that cavity, use the cash machine, mail those letters—without an engineer.

(Courtesy of the American Council of Engineering Companies ([ACEC] of Minnesota)


The Future

It is so hard to fathom that the devastation that can happen in just days can take so long to restore. The 1965 flood and the Big Thompson Canyon flood in 1976 were restricted to smaller areas compared to the September 2013 flood. Three strategies for rebuilding need to happen:

1. Rebuild temporary roads and bridges to reconnect the people and communities and to withstand the spring runoff event;

2. Design and construct permanent roads and bridges that will better withstand another event like this one;
3. While performing #2, integrate sustainable and more resilient designs so the infrastructure can withstand a future event as this will happen again.

Engineering is a profession that is both highly theoretical and highly empirical. Engineers learn from every flood, earthquake, hurricane, and man-made disastrous event and apply that learning to future designs. Through it all, Colorado's engineers remain committed

to staying one step ahead in order to continue to meet the needs of clients and the people of Colorado. 

Mark Hamouz is a Professional Engineer with Alfred Benesch & Company. The company designs complex bridges and highway interchanges, and vehicular and railroad river bridges; implements value engineering principles; and leads value engineering workshops. It also performs inspections of highway and railroad bridges and transit facilities, and assists clients in navigating the complex and ever-changing regulations and policies for the betterment of our infrastructure and benefit of the people of the United States. Mark may be contacted at MHamouz@benesch.com.

Susan Morley Helps Bridge Studies and Real-World Experiences

Susan Morley, senior instructor at the Leeds School of Business, University of Colorado Boulder, sat down with Brian Lewandowski, research associate with the Business Research Division, to discuss the tax classes she teaches at CU and the VITA program she supervises every busy tax season, an IRS-sponsored program.



ready for the CPA exam. Our accounting courses cover the topics tested on the exam, and we have accounting faculty who teach CPA review courses. Students have told me on several occasions that their class notes were just as valuable as the CPA preparation course in helping them pass the exam.

Q: You have become involved in a program called VITA. What is this?


A: VITA stands for Volunteer

Income Tax Assistance and is an IRS-sponsored program that provides free tax return preparation services to low income taxpayers. It has been around a long time nationally, and we have been participating in it at CU for five years. This year Leeds students prepared approximately 500 tax returns and obtained more than \$650,000 in tax refunds for Boulder County taxpayers. To ensure accuracy and completeness, all student-prepared tax returns are reviewed by community volunteers experienced in tax law. Students receive valuable experience working directly with taxpayers, and this hands-on work experience is well received by potential employers. Also, participating in the VITA program gives students an opportunity to perform a much-needed community service.

Q: What are the qualifications required to become a VITA volunteer?

A: Leeds students must take an individual income tax course and pass an IRS certification exam before they can participate in the VITA program and prepare tax returns. They must also pass a standards of conduct and ethics exam.

Q: Can students earn course credit for participating in VITA?

A: Yes, students can earn two pass/fail general business credits for working the VITA site a required number of sessions. Many students, however, simply choose to volunteer their time to help out the community. 

Learn more about VITA at irs.gov/Individuals/Free-Tax-Return-Preparation-for-You-by-Volunteers.

Susan Morley is a senior instructor at the Leeds School of Business. Morley won the Joseph L. Frasca Teaching Excellence Award in 2010 and the David Clough Faculty Support Award for her work with the CU football team in 2009. At the request of Philip DiStefano, chancellor of the University of Colorado Boulder campus, she is a member of CU's Professional Sports Counseling Panel.

Q: I see that you are an alumnus of the University of Colorado; could you touch upon how you ended up here?

A: I attended the University of Kentucky where I received my undergraduate degree. After moving to Colorado, I obtained a Master of Science degree in taxation and became a CPA. I worked for Price Waterhouse in the tax department of the Denver office and then worked for a Fortune 500 mining company before returning to CU to earn a law degree. After law school, I practiced as a tax attorney for several years in Boulder. This work experience has been invaluable to me in the classroom. Whenever possible, I relate my real-world experiences to the material discussed in class.

Q: What would you like the business community to know about the Leeds accounting program?

A: In addition to providing a quality education in financial and tax accounting, we are doing everything we can to help our students obtain employment after graduation. We have expanded our internship program and have designed courses to allow students to both intern at accounting firms and other companies during the busy season (January–March) and take condensed classes after they return from their internships. These accelerated classes start in April and run for five weeks. This allows students to gain valuable work experience during a busy season while earning credits toward their degree. Internships are also a great way to gain full-time employment with the firm after graduation. I was fortunate to work a busy season internship with Price Waterhouse that resulted in full-time employment. Most of our MSBA students secure employment before they graduate. We are very proud of this.

Q: Do you feel that upon graduation students are ready to sit for the CPA exam?

A: Yes, absolutely. I think our accounting division does a tremendous job getting our students

Elements of the National VITA Program

- VITA offers free tax help to low income taxpayers who make under \$52,000.
- In 2013, nearly 92,000 people volunteered and prepared more than 3.3 million returns nationwide.
- VITA increases tax compliance and improves the accuracy rate of tax returns.
- Several VITA sites are located in Colorado, including Limon, Loveland, Fort Collins, and Denver.

EKS&H: Choosing to be in Colorado and Growing with the Community

Paul Kaiser

The origins of Colorado's largest locally based public accounting and consulting firm, EKS&H, go back nearly 40 years, to 1978. That year, Doug Ehrhardt and Bill Keefe founded a firm, and were soon joined by Dave Steiner (BusAcct'75), a Colorado native and CU alum. Eventually, Ehrhardt, Keefe & Steiner merged with Hottman, Harris & Drake, another Denver firm, founded by another Colorado native, Bob Hottman.

Through this merger, the four individuals made a decision to create a "different kind of accounting firm." The goal of this new firm was to be a true, trusted business advisor to clients. Though the foundation of EKS&H was and remains on serving local clients, as the Colorado economy has grown and expanded, so has the firm and its capabilities. With more than 500 employees and three offices, EKS&H is now the 45th-largest public accounting firm in the country, serving clients throughout the Rocky Mountain region, across the country, and around the globe.

Though the firm now has a truly global reach, recruiting efforts remain locally focused. With the third-highest percentage of college-educated state residents, why recruit anywhere outside of Colorado? EKS&H is proud to maintain long-standing relationships with many of the local colleges and universities. In fact, nearly 60 current employees are CU alumni—including nine current partners and the chairman.

Strategic Acquisition—Expanded Services

Recently, EKS&H completed its first major acquisition.



Infolink Consulting, another home-grown Colorado company, is a technology company that implements valuable information delivery and business analytics solutions. Its services include business intelligence, performance management, data integration, and software training. According to EKS&H Partner and CU alum Melissa Brownstein, "From private equity to healthcare, and from public sector

to manufacturing, the solutions their highly talented professionals provide will fit in seamlessly with the opportunities we offer clients in many industries."

EKS&H assists clients with a full range of audit, tax, and financial and technology consulting services to help address growing challenges and opportunities in a wide variety of industries. One such example was the recent transaction services work with Boulder-based Avery Brewing.

Acquiring Financing—From the Right Colorado Partners

After three years of planning, ground was broken in January on Avery Brewing's new 96,000-square-foot brewery and restaurant. Achieving this remarkable goal, however, was not always an easy process. To accomplish the nearly \$30 million construction project, EKS&H helped the brewery find financing, and more importantly the right business partners. "First we helped the founders, Adam and Larry Avery, strategically understand the cash flow, balance sheet, and bank covenant implications of their loan options," said CU alum and EKS&H Partner, Lori Gibson (BusAcct'82). "Then we helped them find the right lending partner—one that would understand their business goals and objectives and work with them long term to achieve those." The new facility could be operational as soon as December 2014.

Commitment to the Community—And Each Other


The success of locally based, organic growth for firms like EKS&H is based on three equally important strategies said partner, Brent Peterson (BusAcct'89). "We aim to serve the best companies and organizations in the state. We recruit the brightest students from schools like the University of Colorado Boulder, and we provide significant support to critically important local nonprofit institutions." Since 2003, EKS&H has organized an annual firm-wide day of service and through this effort employees, and their families and friends, have contributed more than 10,000 hours to a wide variety of organizations, including Volunteers for Outdoor Colorado, Colorado Therapeutic Riding Center, Denver Urban Gardens, Denver Children's Home, Family Tree, Anchor



Center for Blind Children, and Easter Seals Rocky Mountain Village.

This year's EKS&H day of service was just completed in conjunction with the local nonprofit Concerts for Kids on its annual community service day. On Saturday, April 26, more than 40 individuals, including five partners from EKS&H, went to Savio House, an organization dedicated to eliminating violence, crime, drug and alcohol abuse, child abuse and neglect, and other destructive behaviors in families through care, support, and education. For more than six hours EKS&H volunteers assisted with landscape projects, including planting trees, mulching gardens, laying a brick patio, as well as painting the exterior of one of the organization's buildings. "We were honored to be able to partner again this year with amazing Colorado nonprofits like Concerts for Kids and Savio House," said EKS&H CEO Bob Hottman. "These two organizations are doing incredible work helping children and families in our community, an area that is linked directly to our core value of *commitment to each other*."

A Different Kind of Firm—Now and in the Future

Though many firms in the accounting and consulting industry say the same thing, "expertise, quality, service..." EKS&H is more than that. The company has always believed that serving its clients and supporting the Colorado community is an honored obligation. Based on this foundation and following this philosophy, EKS&H will continue to be Colorado's premier accounting and consulting firm well into the future. After all, that's what being a true business advisor is all about. 

Paul Kaiser is a Marketing Manager with EKS&H. For more information about EKS&H, contact Brent Peterson. Peterson, CPA, is an audit partner with EKS&H and leads the high tech practice as well as the Technical Accounting and Advisory Group (TAAG) at the firm. He can be reached at bpeterson@eksh.com or 303-740-9400.

Professional, Scientific, and Technical Services Fuel Colorado's Advanced Industries

Noah Aptekar and Jonathan Belais

Colorado is at the forefront of the national dialogue—championed by the Brookings Institution and McKinsey & Co.—regarding the importance of R&D and STEM intensive “advanced industries” (AIs) to U.S. competitiveness and future economic growth. (STEM is science, technology, engineering, and mathematics.) The AIs are highly varied and straddle advanced manufacturing industries and the Professional, Scientific, and Technical Services subsector of the Professional and Business Services Supersector.

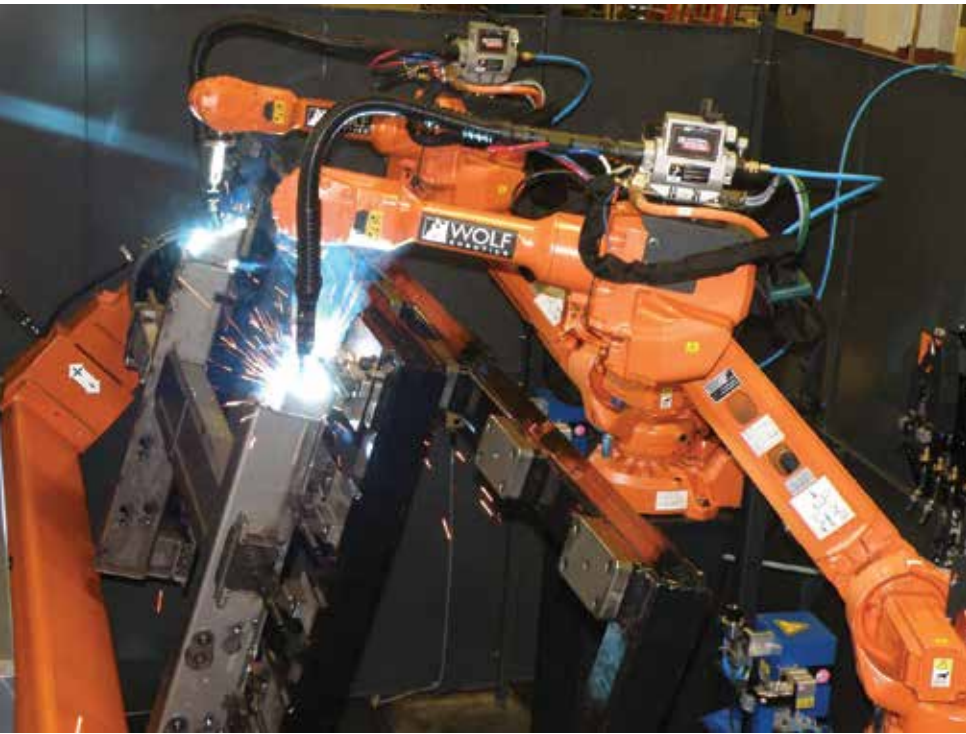


Photo courtesy of the Colorado Advanced Manufacturing Alliance.

The Colorado Office of Economic Development and International Trade (OEDIT) has identified seven of the state's key industries as AIs: advanced manufacturing, aerospace, bioscience, electronics, energy and natural resources (including cleantech), infrastructure engineering, and technology and information. Collectively, these AIs provide more than a half million quality and high-paying jobs in Colorado—out of roughly 2.4 million total jobs—and account for 30% of the state's wage earnings, 30% of the total sales revenues across all industries within the state, and 35% of the value of all goods sold outside the state. These statistics are based on analysis of Quarterly Census of Employment and Wages (QCEW) data for the state of Colorado using EMSI.

Given the importance of the AIs to the Colorado economy, OEDIT is working diligently with firms,

research institutions, industry associations, government officials, and other stakeholders to accelerate the growth of these sectors. In 2013, the Colorado General Assembly passed the Advanced Industries Acceleration Act that created a \$150 million grant program (AIA program) over the next 10 years to accelerate commercialization of new technologies (through proof-of-concept grants), the growth of startups (through early-stage capital and retention grants), and the development of an effective innovation system (through infrastructure grants). The AIA program has quickly become one of OEDIT's most effective tools for supporting the state's AIs and plays a key role in the broader AI strategy for the state. In addition to providing grant funding to specific companies and projects through a rigorous, competitive process, the AI strategy emphasizes collaboration—across industries, research institutions, and government—and the engagement of the Professional, Scientific, and Technical Services providers in contributing the financial and strategic support necessary to grow and launch new AI companies.

Within a year of new legislation passing, OEDIT has provided more than \$5 million in funding to proof-of-concept projects and early-stage companies. This funding is provided, with a match, to help entrepreneurs and innovators achieve the specific milestones necessary to commercialize their technologies and products in Colorado. Acquisition of professional and technical services plays a major role in the scope of work for most grant recipients. Beyond direct funding, OEDIT has worked tirelessly to connect these companies to industry associations and services firms to help them overcome their commercialization barriers. This includes introducing companies to intellectual property management professionals, engineering and design firms, and prototyping partners, as well as legal and accounting firms. In this way, the professional and technical services industry is a critical component of the development of Colorado's AI ecosystem.

The Professional, Scientific, and Technical Services subsector accounts for roughly 200,000 jobs in Colorado; 100,000 of these are considered directly within Colorado's AIs—accounting for one-fifth of the employment in the AIs. These are predominantly jobs in engineering-based industries, research and development (including federal laboratories that are government-owned and contractor-operated, like the National Renewable Energy Laboratory), and other technical industries. The majority of the 100,000 Professional, Scientific, and Technical jobs not counted in the AIs include lawyers, accountants, and consultants who operate across sectors and are also critical to the AIs.



Photo by Glenn Askawa, courtesy of the Laboratory for Atmospheric and Space Physics.

Highlights of the impact of Professional, Scientific, and Technical Services across the seven advanced industries follow:

Advanced Manufacturing: Any manufactured product requires a team of engineers and designers to develop, prototype, test, and refine a design. U.S. manufacturing has a reputation for innovation, high quality, and precision — particularly for complex products. Research and development, industrial design, and engineering expertise may exist in-house at some manufacturing firms or may be contracted out to a third-party firm.

Aerospace: During 2012, OEDIT worked with the Brookings Institution and McKinsey & Co. to analyze the Colorado space economy as part of its national

AIs program. One outcome was the identification of the breadth of the value chain for Colorado's aerospace industry, which includes the research and development of new instruments, computer systems, and aerospace vehicle designs with federally funded laboratories. This also includes the advanced engineering and operations of systems like satellites and their instruments. The use of these systems for surveying and geographic information system (GIS) application also falls within professional, scientific, and technical services.

Bioscience: Of all the AIs, bioscience may be the most closely linked to basic research. This includes the work of contract research organizations to conduct

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Photo courtesy of the Colorado Advanced Manufacturing Alliance.

Colorado Startup Value Survey

Jason Schrock, Spencer Imel, and Laura Blomquist

Because firms in the Professional and Business Services (PBS) Sector generally operate by providing technical and support services to other businesses inside and outside the state, Colorado's PBS Sector is closely tied with broader economic conditions. Specifically, firms in the PBS Sector tend to especially thrive during periods when a large number of businesses are being created or are expanding, generating increased demand for advisory and support services. New business activity continues to expand in Colorado, which should help the PBS Sector.


In order to better understand Colorado's economy and the startup environment in the state, the Governor's Office of State Planning and Budgeting recently completed a study that helps assess overall business creation and expansion activity in Colorado and thus the potential for growth in the PBS Sector. The study surveyed entrepreneurs to better understand the state's environment for new and expanding businesses, or the "entrepreneurial ecosystem." The survey responses help gauge the levels of satisfaction with the resources and costs faced by entrepreneurs in Colorado.

To understand what drives entrepreneurs' satisfaction with their community, the survey explored how they conceptualize "the value" they receive from the community. After conducting interviews with entrepreneurs,

investors, and leaders in the startup community, a framework was constructed for interpreting the costs and benefits, or "the value proposition," that entrepreneurs face when starting a business in Colorado. This framework, the Value Tree for Entrepreneurs, shown in the figure, broadly illustrates the categories of benefits and costs that were identified by participants in the interview process. These categories are components of the ecosystem in which entrepreneurs operate. This framework was then used to create a series of surveys that asked responding business owners to rate their satisfaction with each component identified in the interview process.

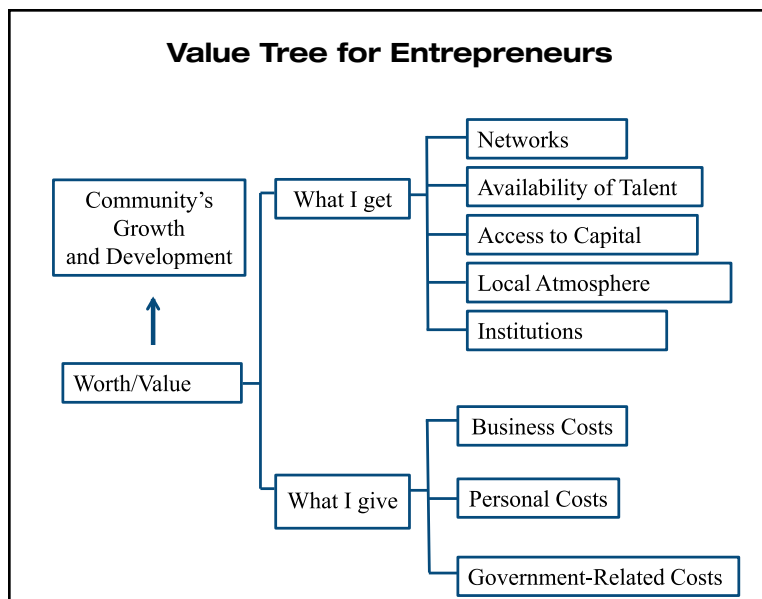
In December 2013, data were collected from more than 700 businesses, which created a broad-based dataset that describes the value of Colorado's ecosystem for new businesses as perceived by entrepreneurs themselves. A summary of the data, included in the table, shows the average scores that were given by survey respondents. Also, it shows the relative impact weight of each component of the value proposition, or the relative importance of each component on the entrepreneur's satisfaction with their community, derived using regression analysis. The data indicate that owners of new businesses in Colorado are most heavily concerned with the atmosphere in which they live and work and the networks of advisors, skilled workers, peers, and service providers that are available to them.

The data showed great unevenness in satisfaction levels among business owners in various sectors and geographic areas of the state.¹ The strongest satisfaction levels were found among business owners in information and technology-related businesses and were especially concentrated in the Boulder and Denver Metro area.

The data have two main implications for the PBS Sector. First, the survey results reinforce findings of other recent studies that Colorado offers a rich ecosystem of resources for new businesses, especially in technology-related industries. Because a large portion of the demand served by firms in the PBS Sector comes from businesses in these industries, this indicates the potential for more growth for Colorado's PBS Sector going forward. Additionally, it indicates that the relationships between new businesses and those individuals and firms that support them, including providers in the PBS Sector, are among the most valuable components of Colorado's environment for business growth. 

The Economics Team in the Governor's Office of State Planning and Budgeting (OSPB) includes Jason Schrock, Chief Economist; Spencer Imel, Economist; and Laura Blomquist, Economist. In OSPB they develop state revenue estimates, produce the Governor's Quarterly Revenue and Economic Forecast, monitor the legislative budget process, and provide accurate and concise public information on the economy.

¹ The survey data can be accessed at www.colorado.gov/startupvaluesurvey.



Attribute	Impact Weight	Colorado Score
What Startups Get		
Network for Startups	38%	7.0
Availability of Talent	6	6.1
Access to Capital	11	4.7
Local Atmosphere	29	8.3
Institutions	15	6.0
"What I Get"	100%	7.0
What Startups Pay		
Business Costs	52%	6.0
Government-Related Costs	18	5.2
Personal Costs	30	6.0
"What I Pay"	100%	6.3
Overall Value		
What I Get	71%	7.0
What I Pay	29	6.3
Overall Value	100%	7.8

Source: OSPG Survey Data Colorado 2013.

Summary of the Professional and Business Services Industry

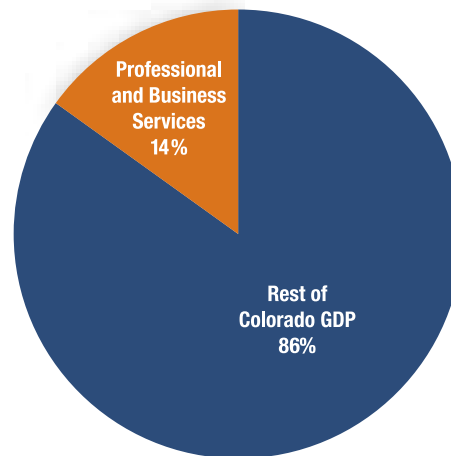
Brooke Fox, Jim Dalton, Sam McMeley, Jimmy Owsley, Noah Seidenfeld, and Ryan Thorpe

Professional and Business Services (PBS) is part of the services-providing supersectors. PBS consists of three subsectors: Professional, Scientific, and Technical Services; Management of Companies and Enterprises; and Administrative and Support and Waste Management and Remediation Services.

The 2013 Colorado GDP was \$294.4 billion, of which \$41.2 billion (14%) was accounted for by PBS. Professional, Scientific, and Technical Services GDP was the largest portion (63.9%) of total PBS GDP in Colorado in 2013, and grew 4.7% year-over-year in both 2012 and 2013. Management of Companies made up 15.1% of total PBS GDP, growing 21.3% real growth in 2012 and contracting 6.4% in 2013. Administrative and Waste Management Services accounted for 21% of PBS, grew 5.2% in 2012 and shrank 2.9% in 2013. Average PBS wages were 38.2% above average nonfarm covered wages in Colorado.

Nationally, PBS employment increased 3.6% year-over-year in April 2014, outpacing the 1.7% year-over-year growth in total employment. PBS employment has grown 6.1% above the prerecession peak, adding 1.1 million jobs, compared to 0.1% growth in total employment. Growth in the industry can be attributed to the addition of jobs in accounting and bookkeeping services, temporary help services, and services to buildings and dwellings.

Total Colorado GDP

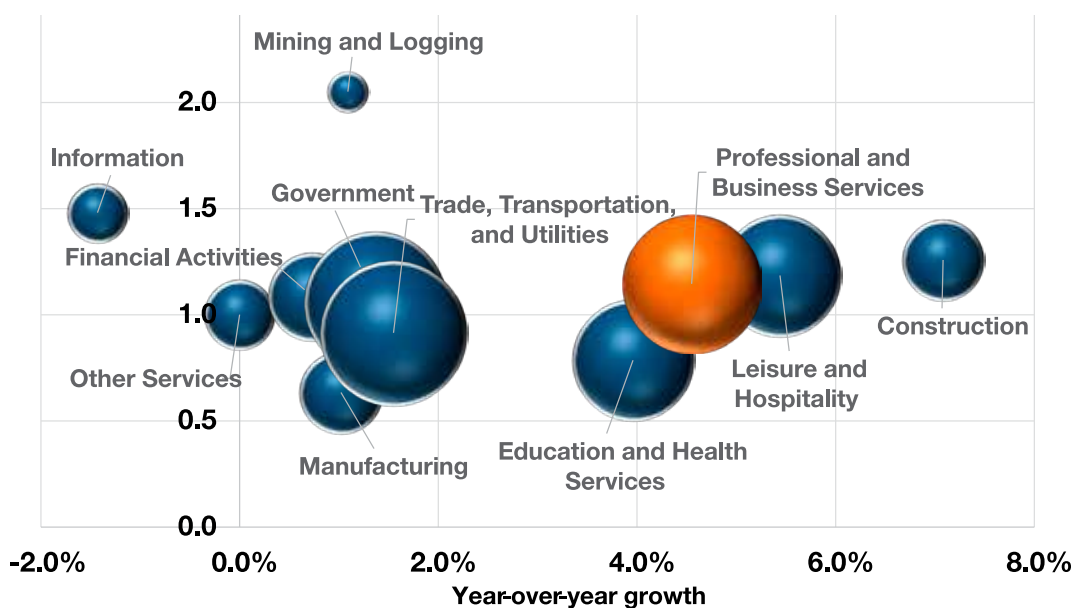


Source: Bureau of Economic Analysis.

After Trade, Transportation, and Utilities and Government, the PBS Supersector represents the third-largest share (15.8%) of Colorado's employment, with a total of 386,000 jobs. PBS employment has continued to outperform total employment. In Colorado, PBS has grown 8.2% above the prerecession peak compared to 3.2% for total employment in the state. In Colorado, the industry added 16,800 jobs year-over-year in April 2014, a 4.6% increase. This gain has been primarily driven by the increase in Professional, Scientific,

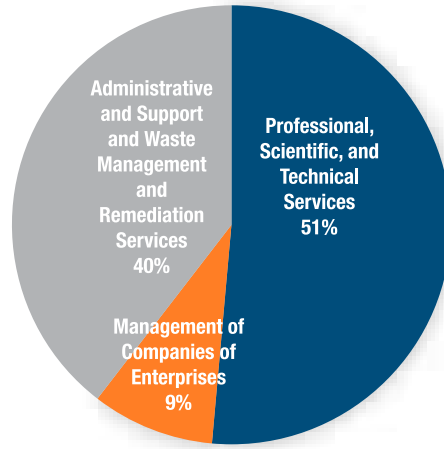
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Colorado Employment, April 2014



Source: Bureau of Labor Statistics, CES.

PBS Employment



Source: Bureau of Labor Statistics, Current Employment Statistics (NSA), 2013.

and Technical Services, which added 10,400 jobs, a year-over-year increase of 5.5% in April. Administrative and Waste Management added 6,300 jobs (4.3%) and Management of Companies added 100 jobs (0.3%). In total, the PBS Sector represented 15.8% of total employment in Colorado in April. The majority of PBS employment (51.3%) is in the Professional, Scientific, and Technical Services subsector, followed by Administrative and Waste Management (39.7%) and Management of Companies (9%).

The greatest concentration of PBS jobs is within urban counties. Denver has the greatest number of Professional, Scientific, and Technical Services; Management of Companies; and Administrative and Waste Management jobs. Boulder has the second-most jobs in Professional, Scientific, and Technical and Management of Companies, and El Paso and Arapahoe are second and third in the number of Administrative and Waste Management jobs.

Colorado demonstrates several strategic advantages across PBS industries and subsectors. These advantages include a large percentage of persons 25 and older who hold a bachelor's degree (35%—third highest in the nation), a business- and entrepreneur-friendly environment, and a unique quality of life that attracts young professionals. Due to a tightening national professional-services labor pool, the starting salary for U.S. professionals is expected to rise 3.4% in 2014. Increases in the Denver area may be moderately higher according to Robert Half International, a staffing services company.

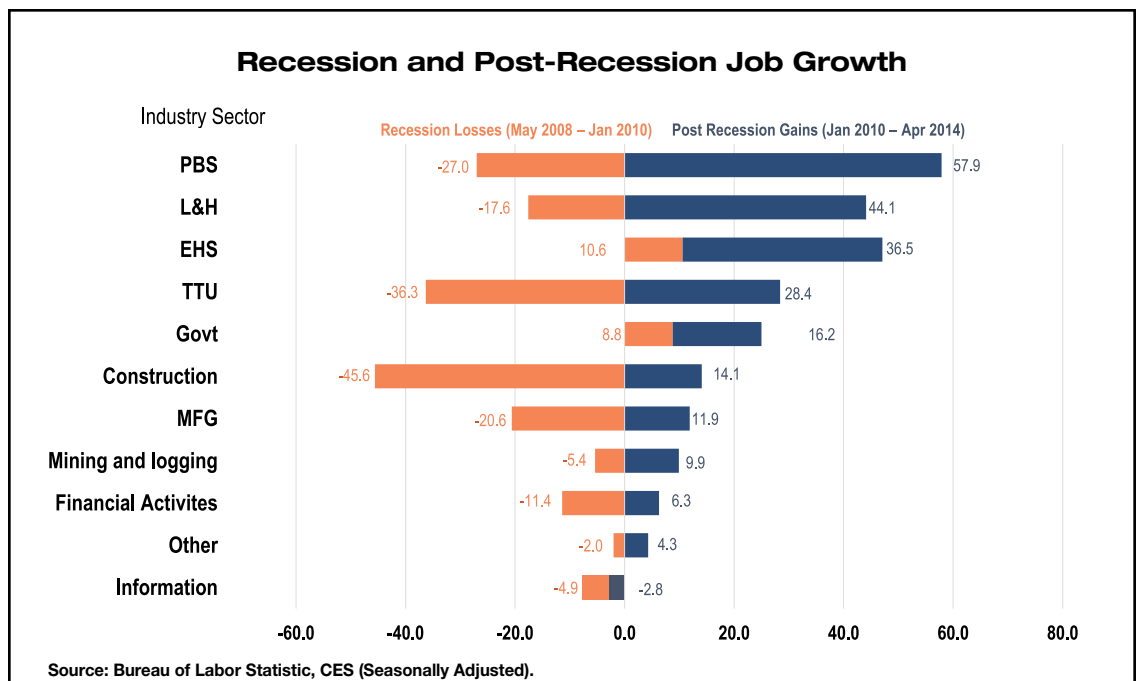
Employment through the Recession

Recently, the PBS industry has been experiencing positive employment growth; however, it suffered during the Great Recession. Examining the period from peak total employment in Colorado (May 2008) to when the state reached a relative minimum level of employment (January 2010), the PBS industry fell 7.6%. Only Construction; Mining and Logging; Manufacturing; and Trade, Transportation, and Utilities saw greater declines. Since January 2010, when the state started to gain jobs back, PBS employment has been growing, climbing 17.6%. In percentage terms, only the Mining and Logging industry has recorded a greater gain in employment. The PBS Sector has recovered the jobs it lost during the recession and is a stable source of jobs in Colorado.

PBS Subsectors

Professional, Scientific, and Technical Services

Firms in this diverse sector provide a range of specialty and general services to businesses in Colorado. They are often built on talent-based business models using specialized consultants, architects, lawyers, and engineers. The reluctance of companies and



organizations to commit to in-house full-time hires continues to support overall demand for many project-based professional consulting services. As a result, the growth in demand for management consulting services and employment increased in 2013. Colorado's largest employers in this sector include such companies as law firm Holland & Hart, the accounting firm EKS&H, and the engineering and construction services firm URS Corporation.

Management of Companies

This subsector is made up of establishments that hold the securities of companies and enterprises for the purpose of owning a controlling interest or influencing management decisions or establishments that administer, oversee, and manage establishments of the company of enterprise. Many of these firms are company headquarters, and Colorado continues to make gains in this area. This sector also includes companies that manage other businesses such as Vail Resorts, Echosphere (Dish Network), Johns Manville, Comcast, and Arrow Electronics, among others.


Administrative and Waste Management

The Administrative and Waste Management subsector includes establishments that perform routine support activities for the day-to-day operations of other organizations. Among those activities performed are office administration, hiring and placing of personnel, document preparation and similar clerical services, solicitation, collection, security and surveillance services, cleaning, and waste disposal services. The growth forecasts for construction and consumer spending, combined with continued volatility and lower demand and prices for recyclable commodities, indicate 3.1% job growth in this subsector this year.

Educational Attainment of PBS Workforce

Educational attainment levels of the Professional and Business Services Sector is diverse; all education levels, including incomplete high school degrees to doctoral/professional degrees. The Administrative and Waste Management subsector has a higher number of high school/equivalent and non-high school graduates than the Management of Companies or the Professional, Scientific, and Technical Services subsectors. In all, the most prevalent educational attainment level of the PBS Supersector is a bachelor's degree, and the second-most common level is some college but with no degree.

Conclusion

Overall, the PBS Sector in Colorado is a stable and plentiful source of well-paying jobs. While workers with bachelor's degrees make up a significant portion of the workforce, there are well-paying job opportunities for individuals with a high school or associate's degree. Like other industries, the PBS Sector declined during the recession but has rebounded and experienced job growth of 18.2% since the industry stopped losing jobs in September 2009, three months prior to the state. PBS holds a relatively large share of jobs in the Colorado labor market, and it is projected to experience strong positive job growth in 2014. 

Brooke Fox, Jim Dalton, Sam McMeley, Jimmy Owsley, Noah Seidenfeld, and Ryan Thorpe are Student Research Assistants with the BRD.

Sources

Bureau of Economic Analysis. National Real GDP by Subsector. <http://www.bea.gov/iTable/iTable.cfm?ReqID=9&step=1#reqid=9&step=1&isuri=1>. Accessed May 26, 2014.

Bureau of Economic Analysis. State GDP by Industry Subsector. <http://www.bea.gov/itable/iTable.cfm?ReqID=70&step=1#reqid=70&step=1&isuri=1>. Accessed May 26, 2014.

United States Bureau of Labor Statistics. National Professional & Business Services statistics, Current Employment Statistics. http://data.bls.gov/pdq/SurveyOutputServlet;jsessionid=7B09983841596029116C21513A56C25D.tc_instance4. Accessed May 25, 2014.

United States Bureau of Labor Statistics. Occupational Attainment of Education Percentages. http://www.bls.gov/emp/ep_education_tech.htm. Accessed May 18, 2014.

United States Bureau of Labor Statistics. Professional & Business Services Employment by State and County, Current Employment Statistics. http://data.bls.gov/pdq/SurveyOutputServlet;jsessionid=E14CEBB72A1E714D25F73488C97EF5DC.tc_instance4. Accessed May 18, 2014.

United States Census Bureau. Professional & Business Services Employment by State and County, Current Employment Statistics. http://data.bls.gov/pdq/SurveyOutputServlet;jsessionid=2AE782DAEF0FF4653D66EA439DF51730.tc_instance4. Accessed May 25, 2014.

United States Census Bureau. Statistics of U.S. Businesses-State by County, NAICS Sectors employment. <http://www.census.gov/econ/subb>. Accessed May 26, 2014.

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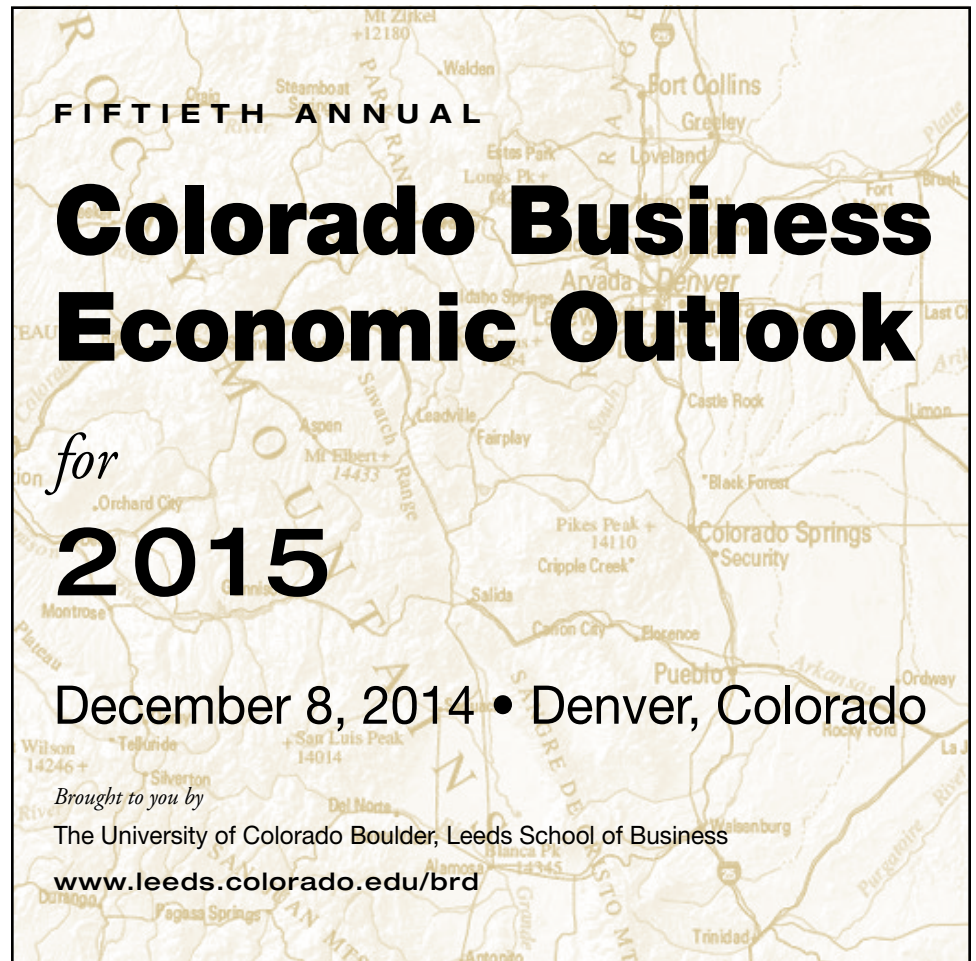
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PST SERVICES FUEL COLORADO'S ADVANCED INDUSTRIES, CONTINUED FROM PAGE 7

preclinical research and clinical trials, as well as develop biomarkers and other tools that can assist in drug development or the testing of medical devices.

Electronics: The electronics industry is driven in large part by enabling technologies, including photonics, nanomaterials, microelectronics, and advanced materials, which are, in turn, reliant upon research and development. In Colorado, the National Institute for Standards and Technology (NIST) Boulder Labs and CU-Boulder are leaders in advancements of these enabling technologies that have led to three relevant Nobel Prizes in physics since 2001.

Energy and Natural Resources (including Cleantech): The National Renewable Energy Laboratory (NREL) is one of the major research and development organizations within the state dedicated to the advancement of new technologies in energy and cleantech. Products in cleantech, in particular, require critical design and engineering expertise and research

testing in order to be successfully utilized in major commercial construction projects or to be effectively integrated into the energy system.

Infrastructure Engineering: World-class engineering, design, commercial, and civil construction firms call Colorado home, and they sell their services to the world. From major water projects and environmental engineering to state-of-the-art airport and utilities facilities design, the expertise comes from Colorado and is deployed everywhere. Colorado is home to tens of thousands of highly trained engineers—one of the highest densities of engineers compared to any state in the nation—who work on major civil, commercial, and environmental projects serving the needs for secure water, energy, and ecosystems, as well as major stadiums and venues. Both developed and developing countries present major market opportunities for Colorado's engineering, design, and construction services firms, as their services are unparalleled.

Technology and Information: Some of the largest segments of Professional, Scientific, and Technical Services are computer systems design services and customer computer programming services. All of the AIs (including manufacturing) are driven by software and computer systems, which are critical to the Professional, Scientific, and Technical Services subsector.

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