The Colorado Space Business Roundtable (CSBR) and Leion™ are partnering through CSBR's *Promoting Realtime Opportunities for Professional Education and Learning* (PROPEL) initiative to build an adaptable workforce that benefits the aerospace industry. We have taken one small step, identifying a possible new source of satellite operations talent. Now we are looking for aerospace partners to join us in making it real. Get involved!

Contact us to participate.

Volatility in the Labor Market

Demand for aerospace workers fluctuates and can be difficult to predict. For example, future demand for satellite operators is affected by conflicting forces. On the one hand, the number of satellites on orbit is projected to grow by tens of thousands by 2030, suggesting a significant increase in demand for satellite operators. On the other hand, autonomous operation reduces some demand and changes job descriptions. Predicting market demand, timing, and job descriptions for satellite operators presents a challenge for the industry.

Both trajectories of market demand bring challenges for employers. When demand increases, employers must fill jobs quickly or lose productivity.[1] Existing workers may not fill all that demand, and traditional workforce development programs have long pipelines that limit the pace of their supply. As a result, aerospace jobs take the longest to fill at 67 days on average.[2] Alternatively, when demand decreases, employers may have to resort to costly layoffs, often spending between $40k and $80k per laid-off employee.[3] Layoffs also damage morale, productivity, employee retention, institutional knowledge, and reputation.[4] Figure 1 below highlights the level and duration of some of that damage.[5] Neither growth nor decline shields employers from workforce challenges and costs.

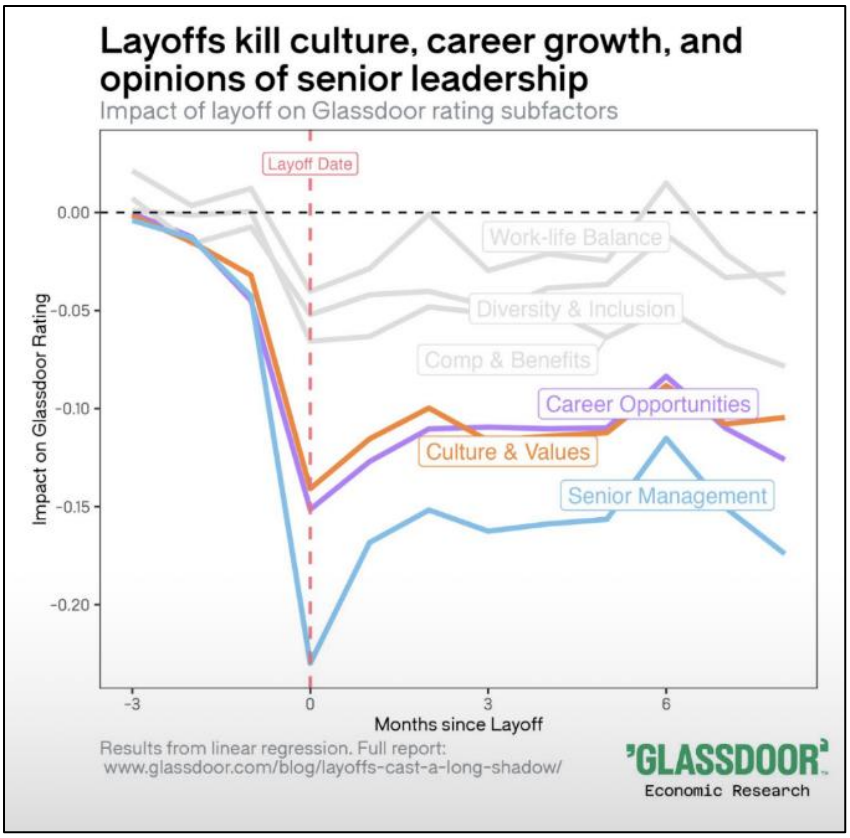

Fig. 1 A layoff event, marked by the vertical red dashed line, damages Glassdoor employer ratings in every category, with the effects extending at least 9 months.

Docking as an Analogy for Hiring

Hiring is like a docking operation that brings employer and worker together. Many employers expect to dock with workers using hard capture alone. They post a highly specific job description and wait for a near-perfect fit with someone who has done the exact job before. But a soft-capture mechanism expands the target and introduces flexibility through range of motion, guiding the two sides together until they successfully achieve the hard capture. Considering outside talent is a soft-capture mechanism for the aerospace workforce.

An Adaptable Workforce

To fill jobs quickly but intermittently, aerospace employers would benefit from a more adaptable workforce. Workers in an adaptable workforce move more freely across disciplines, companies, and industries to meet changing market demand. Workers contribute to adaptability by learning to apply the first principles of their primary jobs to other fields. Then they can be ready to redeploy when markets shift. In other words, they can leave low-demand jobs, voluntarily or otherwise, and move efficiently into higher-demand jobs with similar first principles. And they can move back efficiently when demand changes. Some jobs in the workforce are already adaptable, such as accounting. Other jobs are less suited to adaptability, such as surgery. Between those two extremes lies the opportunity to increase workforce adaptability.

An adaptable workforce enables faster hiring, improved productivity, and economic resilience. It also spreads new ideas. When workers move into new roles, they bring new solutions and networks with them that can help offset their lack of experience in a new job. A 2007 study[6] demonstrated this value. 166 companies open-sourced hard problems that had stymied their expert researchers. 30% of the problems were solved during the duration of the study, and all of those 30% were solved by outsiders with different experience and backgrounds. Adaptability breeds innovation.

The building blocks of a more adaptable workforce include awareness, courage in employers to train and hire non-traditional candidates into appropriate jobs, courage in workers to try new things, support from policymakers and other stakeholders, mechanisms for communicating about opportunities, and a framework for pairing or grouping jobs that share first principles. This brochure introduces the pursuit of a job pairing between satellite operations and geosteering, a job function in the oil and gas industry. Geosteering is the planning and execution of placing a horizontal wellbore optimally within resource-rich rock layers. Typically performed by degreed and experienced geologists, it could prove to be a new adaptable source of satellite operations talent.

Who We Are

The Colorado Space Business Roundtable (CSBR) is a 501(c)6 trade organization fueling the success of Colorado's aerospace economy. Our mission is to strengthen, nurture, and expand Colorado's dynamic space economy, ensuring the state remains a leader in the global aerospace marketplace. Through its PROPEL initiative, CSBR is partnering with Leion to build a more adaptable workforce.

Leion was founded to ease friction in the movement of people – and the solutions, networks, and markets they bring with them – across employers and industries. Leion's founder transitioned to aerospace after a career as an oil and gas executive, leveraging first principles of her experience to become an executive at two private aerospace companies and a non-profit doing workforce development. Although she has never geosteered a well or operated a satellite, she has directly managed people who have.

When she became curious about the apparent similarities between the roles, she recruited two of those former employees to investigate. One has geosteered for public and private companies and has hired, trained, and managed other geosteerers. The other has operated in LEO, served as a guidance, navigation, and control engineer for a major university's satellite laboratory, and was a mission design engineer and orbital mechanics analyst for a private aerospace company. They have 16 and 7 years of experience, respectively, and both now own their own companies. Leion framed the problem for them, captured their results within the larger context, and then partnered with CSBR through the PROPEL initiative to take the next steps, starting with this brochure.

"Radical innovations often happen at the intersections of disciplines."

- Harvard Business Review[6]

Increasing workforce adaptability requires demonstrating real-life adaptations. We asked what an adaptable workforce would look like for satellite operators. Where is talent waiting, almost ready to be deployed in times of growth, and ready to go back where they came from when budgets get cut? Who can learn satellite operations with relative efficiency? We began with geosteering, and we see future opportunities to explore other jobs that may belong in the same job grouping, such as air traffic control, Mars rover operations, and shipping, trucking, and rail logistics.

We wanted to know whether geosteering and satellite operations employ similar skills, software, data types, communication, uncertainties, and work cultures.[7] To explore these questions, our two participants introduced each other to the technical and operational fundamentals of geosteering and satellite operations through one-on-one presentations and discussion. They then used their expertise to assess qualitatively whether they believed those fundamentals overlapped in ways that could support a more adaptable workforce. Each spent about five hours preparing for, engaging in, and reporting on these activities over the course of about two months. Even though the geologic frameworks underlying geosteering differ from orbital dynamics, the participants agreed that the jobs shared valuable similarities that could be exploited for adaptability.

Many similarities emerged from the investigation. Both geosteerers and satellite operators

- guide three-dimensional operational maneuvers of multi-million-dollar assets through alien and remote media to stay within targets and avoid hazards in the execution of a mission
- make real-time, high-stakes decisions under uncertainty
- rely on maturity to shoulder economic and technical accountability
- employ strong procedural discipline, layered team coordination, and fail-safe communication
- work with time-delayed data that require quality monitoring, troubleshooting, and interpretation
- perform trade studies on the selection of what data to invest in under what circumstances, with those investments being in money, time, mass, volume, or power
- take shifts in 24-hour operations
- learn their jobs primarily on the job rather than in college classrooms, including how the tools work, how interpretations lead to actions, and how teams collaborate
- may have job scopes and team structures that are unique to their organizations
- work in cyclical industries with frequent hiring and layoff cycles

These findings led the participants to postulate that experienced geosteerers would be easier to train in satellite operations than new aerospace engineering graduates. While that comparison is unproven, it signals strong confidence that geosteerers will adapt efficiently to satellite operations, putting them at the leading edge of an adaptable workforce.

Various training programs for satellite operations already exist within employer organizations and within training service providers. These training programs can run from weeks to months and can be intended for those with high school diplomas to PhDs. After exploring the overall similarities between the two fields, as described below, the steps in the scope of this initial project are to

(1) identify where geosteerers should be placed in those ranges for the proper level of training,
(2) secure a sponsor to host a small group of geosteerers for training,
(3) select geosteerers for the program, and
(4) execute the training.

Get Involved

Employers

If you employ and/or train satellite operators and are prepared to lead into the future, add a few chairs for geosteerers in your next satellite operations training. Sponsors will test the leading edge of an adaptable workforce and bank future candidates for satellite operations roles. Our goal is to have three or more geosteerers trained for 10-30 hours during the first quarter of 2026 at no cost to sponsors other than their time.

Policymakers

Workforce adaptability leads to more efficient and more productive use of the existing US labor force, even in STEM fields like geosteering and satellite operations. To achieve these results, add reskilling for workforce adaptability to your labor policy alongside traditional workforce development programs that generate brand new workers. Create and expand funding mechanisms for programs like this one and build incentives for employers and workers to engage in training and hiring for adaptability. Policymakers who undertake these challenges will bolster US productivity, innovation, and leadership.

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