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Utah Innovation Ecosystems

Utah's higher education institutions, well-trained workforce, collaborative atmosphere, and culture of innovation contribute to the state's strong innovation ecosystems.

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Acknowledgements

The Kem C. Gardner Policy Institute and the Economic Development Corporation of Utah jointly produced this study of Utah's innovation ecosystems. It highlights the characteristics that contribute to the state's success in innovation and identifies gaps or opportunities for improvement in the various innovation ecosystems. This marks part two of a two-part research series. Part one summarized research to define innovation and innovation ecosystems, explained why innovation ecosystems matter, and illustrated an assessment framework. See Appendix 1 for the part one research summary.

The Governor's Office of Economic Opportunity (GOEO) and the Utah Innovation Lab commissioned this project and provided invaluable feedback throughout the study. Kristina Bishop, Ryan Drafke, and Olivia Midgley provided excellent research assistance. Dianne Meppen, Samantha Ball, and Kara Byrne lent professional expertise to conduct in-depth interviews.

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Utah Innovation Ecosystems

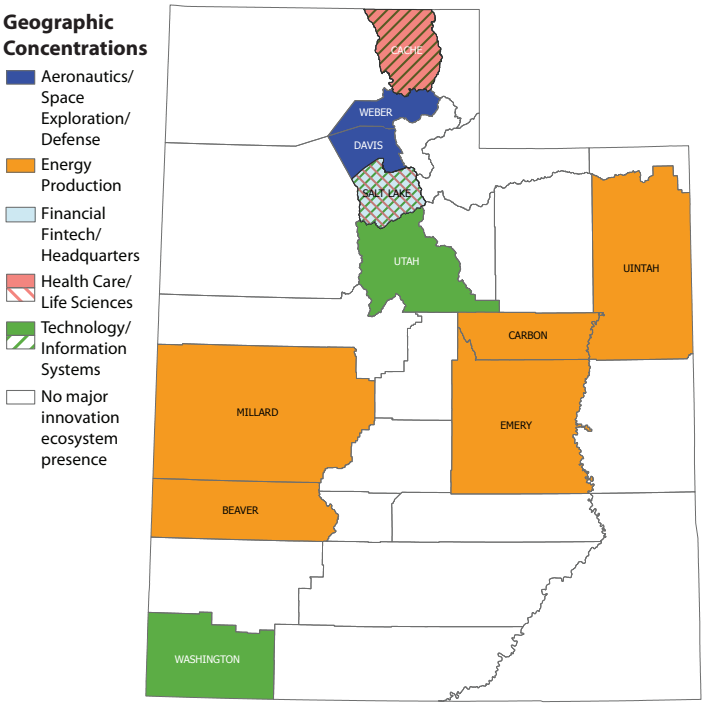
Analysis in Brief

Utah's broad innovation ecosystem ranks high among U.S. states across various measures. Characteristics that have contributed to Utah's success include the state's higher education institutions, a well-trained workforce, social infrastructure, collaboration among innovation ecosystem actors, and a culture of innovation. Continued success of the state's innovation ecosystem may require attention to physical infrastructure and capital funding.

Key Findings

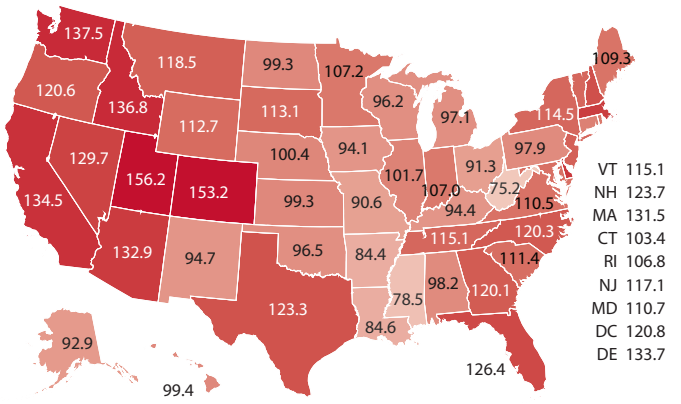
- **Industry-aligned innovation ecosystems** – Besides Utah's broad innovation ecosystem, five industry-aligned innovation ecosystems exist in Utah at various levels of maturity:
  - Aeronautics, Space Exploration, and Defense
  - Energy Production
  - Finance, Fintech, and Headquarters
  - Health Care and Life Sciences
  - Technology and Information Systems
- **Utah's potential innovation strengths** – Potential strengths common across many of Utah's industry-aligned innovation ecosystems include human capital development (especially through higher education institutions); social "infrastructure" such as social capital and networks, industry associations, and collaborative ecosystem actors; and Utah's culture of innovation and entrepreneurial mindset.
- **Utah's potential innovation gaps** – Potential gaps offer opportunities for innovation ecosystem actors to further develop the ecosystems. Potential gaps common across a few of the industry-aligned innovation ecosystems include a lack of physical infrastructure (incubation space/labs, mature innovation hubs/districts, research facilities, etc.) and a lack of venture and other capital. In particular, attracting venture capital for the aeronautics/space exploration/defense, energy production, and health care/life sciences ecosystems has been challenging over the years.
- **Innovative state** – Utah ranks first among U.S. states for innovation capacity and outcomes. The Innovation Intelligence Index (II3), produced by the Indiana Business Research Center at the Indiana University Kelley School of Business, measures core attributes of innovation using five "core indexes" or components: human capital and knowledge creation, business dynamics, business profile, employment and productivity, and economic well-being. Utah ranks 6th or better in each of these attributes.

Utah Innovation Ecosystems



Source: Kem C. Gardner Policy Institute and EDCUtah analysis of multiple data sources (cited in body of report) and of in-depth interviews conducted between June and August 2024.

Headline Innovation Intelligence Index by State, 2023



Source: Indiana Business Research Center, 2024

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SECTION 1:

Introduction and Overview of Utah's Innovation Ecosystem

A successful innovation ecosystem fosters the development of innovation districts and innovation hubs. Figure 1 depicts the relationship of innovation ecosystems, innovation districts, and innovation hubs. Innovation hub is the smallest unit among these terms. The research team focused on identifying and evaluating Utah's innovation *ecosystems*, although innovation *districts* and *hubs* represent characteristics of the broader ecosystems.

A thriving innovative ecosystem demands ongoing evaluation to identify gaps and opportunities. In part one (Appendix 1) of this research project, the research team provided definitions, a literature review, and an opportunity analysis framework. This report represents part two of the research, which focuses on identifying and evaluating Utah's innovation ecosystems. Characteristics of innovation ecosystems are grouped into four main areas for the evaluation: human capital, financial capital, infrastructure, and the surrounding characteristics.

The research team identified a broad multi-disciplinary Utah innovation ecosystem, as well as five ecosystems under the multi-disciplinary umbrella ecosystem which more closely tie to specific industries: 1) Aeronautics, Space Exploration, and Defense, 2) Finance, Fintech, and Headquarters, 3) Technology and Information Systems, 4) Health Care and Life Sciences, and 5) Energy Production. The research team assessed each ecosystem through quantitative data analysis and qualitative analysis from in-depth interviews.

Utah's Broad Innovation Ecosystem

Utah ranks first in the nation for innovation capacity and output based on the latest headline Innovation Intelligence Index (II3)[1]. The headline index consists of five core indexes, with Utah ranking 1st in Economic Well-Being, 2nd in Business Profile and Business Dynamic, 3rd in Employment and Productivity, and 6th in Human Capital and Knowledge Creation. Utah outperforms the national average in every core area.

Definitions – Innovation Ecosystem and Related Terms

Terminology surrounding innovation ecosystems is sometimes used differently in different contexts. As language surrounding the concept of innovation evolves, we define our usage of some key terms below.

Innovation - The process of implementing new methods, products, and ideas to "create new market demand or cutting-edge solutions to economic, social and environmental challenges."[2]

Innovation Ecosystem - The dynamic set of actors, activities, artifacts, institutions, and relationships that influence and are essential for the innovative performance of an individual actor or a population of actors. This includes not only direct relationships but also complementary and substitute relations, forming a complex and evolving environment for innovation.[3]

Innovation District – "Geographic areas where leading-edge anchor institutions and companies cluster and connect with [startups], business incubators, and accelerators."[2]

Innovation Hub - Whether physical or virtual, an innovation hub serves as a space where innovators gather to share ideas, collaborate on projects, and develop solutions to complex problems. In the context of an innovation district, a hub plays a crucial role as a dedicated space for activating resources and fostering relationships essential to growth. Innovation hubs, in this sense, function as microcosms of innovation districts.[2]

Figure 1: Relationship of Innovation Ecosystem, Innovation District, and Innovation Hub

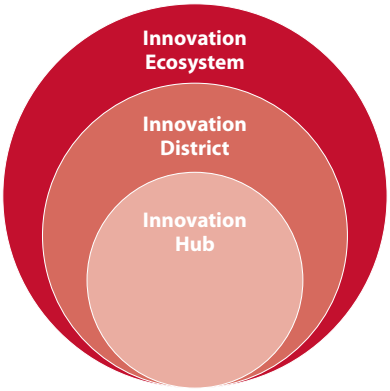
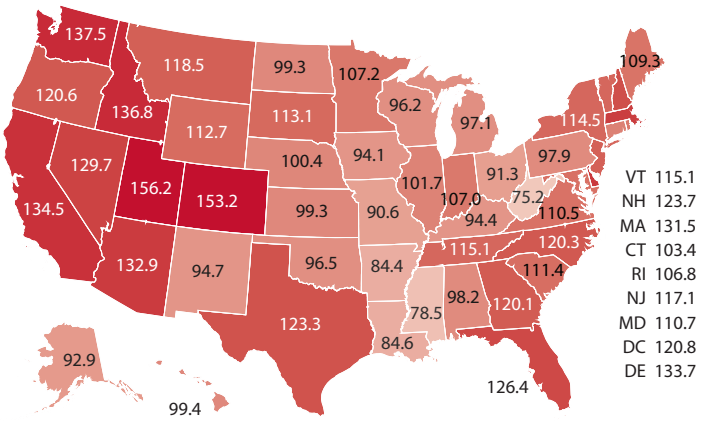
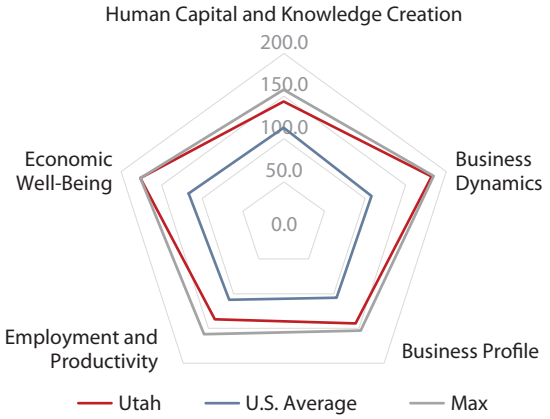


Figure 2: Headline Innovation Intelligence Index by State, 2023



Source: Indiana Business Research Center, 2024

Figure 3: Utah Innovation Intelligence Core Index Rankings, 2023



Source: Kem C. Gardner Policy Institute Analysis of 2023 Innovation Intelligence Index data provided by Indiana Business Research Center

Assessing an innovation ecosystem involves evaluating its key characteristics or drivers and identifying discrepancies between current conditions and successful examples. Various indicators are available for comparing innovation ecosystems at international, national, and regional levels. The research team identified the Innovation Intelligence Index as a suitable measure for comparing Utah to other states.[4]

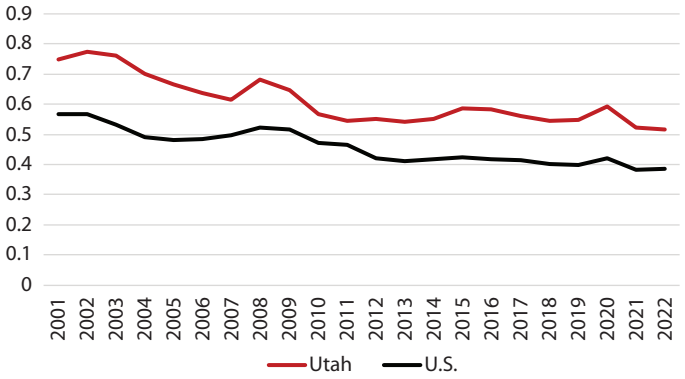
Despite its effectiveness in measuring and comparing regional innovation ecosystems, the index lacks data granularity to industry-aligned ecosystems, limiting its utility as the primary tool for this study. Consequently, this report incorporates data from the Innovation Intelligence Index as part of the quantitative analysis of Utah's overall innovation ecosystem, but not for the specific analysis of Utah's five industry-aligned ecosystems. To complete the analysis, the research team utilized additional data from other credible sources and insights from in-depth interviews of Utah's innovation ecosystem leaders and pioneers.

Human Capital

Important innovation ecosystem characteristics relate to human capital development and include the effectiveness of universities fostering innovation and human capital development before graduation, the support provided by higher education and non-accredited learning institutions for skill development, business creation associated with higher education, and the research and development activities occurring within the ecosystems.

Utah ranks 6th among U.S. states in human capital and knowledge creation.[5] Overall, Utah offers a comprehensive range of educational opportunities for both students and non-students, equipping them with the skills necessary to thrive in innovative industries and ecosystems. Based on the assessment results of five ecosystems in Utah, human capital emerges as one of the strongest components supporting the state's innovation ecosystem.

Figure 4: Utah and U.S. Appropriation of Tax Funds to Higher Education (% of GDP), 2001-2022



Source: National Science Foundation (2024)

Higher Education and Government

Higher education institutions in Utah offer degrees and programs which largely align with the state's five identified industry-aligned innovation ecosystems. The state government allocates more funds to higher education compared to the national average. Although there has been a gradual decline over time, Utah's appropriation of state tax funds for higher education remains higher than the U.S. average (Figure 4).

Different universities in Utah have established strong programs tailored to the state's innovation ecosystem. For instance, Utah State University (USU) specializes in aerospace engineering and technology, while the University of Utah excels in life sciences, health care, general engineering, and business degrees for financial services and fintech. The University of Utah's undergraduate entrepreneurship program ranks 7th overall in the U.S. and 4th among public universities.[6] Both public and private universities significantly contribute to the dynamic innovation ecosystem. Brigham Young University (BYU), for example, is a leader in business programs such as

accounting (3rd overall) and entrepreneurship (34th overall), providing resources for students to start innovation-led businesses.[7] Additionally, Utah's regional and other universities and Utah's community and technical colleges offer degrees and certificates that support a broad range of careers across all identified ecosystems.

The Utah government has also played a crucial role in long-term planning of human capital development within the innovation ecosystem. For example, the Utah's Engineering and Computer Science Initiative, launched in 2001,[8] led to a more than two-fold increase in engineering and computer science degrees awarded by participating institutions from FY 2000 to FY 2022.[9] Furthermore, Utah is a leader in developing industry-recognized certifications (IRCs).[10] The state actively promotes IRCs and requires institutions to incorporate extensive feedback from at least five relevant employers for each initiated IRC-focused program. Both the University of Utah and Utah Valley University (UVU) offer a wide variety of IRC programs. The Utah System of Higher Education (USHE) collaborates with educational institutions and private sector companies to expand career and educational opportunities through the "Talent Ready Utah" program. This program includes multiple Pathways initiatives which connect students to careers in various industries.

Collaboration among higher education institutions, government, and industry have the potential to foster innovation and build a strong workforce. Some areas of Utah's innovation ecosystem could improve in collaboration, as noted by a few of the interviewees. Collaborative partnerships ensure curriculum meets industry demand and that students have internship opportunities, preparing them for the workforce. Utah's higher education institutions host numerous research centers and labs, particularly in aeronautics, space exploration, defense, and energy production, offering students hands-on experience, opportunities for experimentation, and avenues for fostering innovation and technological advancement.

Additionally, an in-depth interview with a higher education leader involved with innovation revealed a pressing need for enhancements in higher education teaching and curriculum to align with industry's current in-demand skills. Student preferences have shifted regarding educational delivery. Students express a preference for in-person collaboration on projects, while showing less enthusiasm for attending lecture-based classes. This shift indicates a demand for a more experiential and interactive learning environment. Developing and expanding workforce training programs will help bridge the gap between academic and industry requirements. Such programs should focus on equipping students with practical skills and an understanding of the cultural and environmental aspects of the future workplaces.

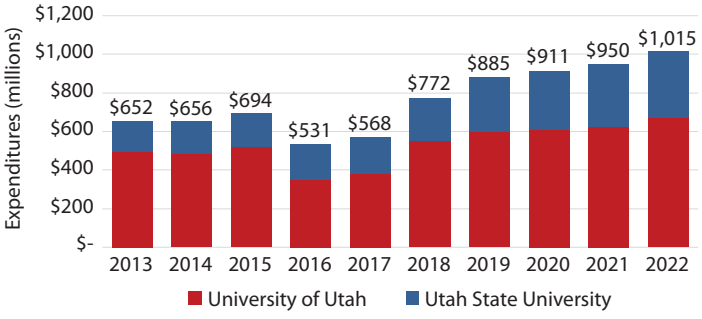
R&D Activities and Commercialization

Utah is home to two prominent R1 research universities - the University of Utah and Utah State University.[11] Both universities provide academic programs at the undergraduate, graduate, and professional levels that produce diverse types of innovations. Research universities offer numerous labs that give students hands-on experience and opportunities for experimentation, such as the pathology labs at the University of Utah's School of Medicine and the Energy Technology Research & Innovation Lab (eTRI) at Utah State University.

These two R1 institutions consistently attract significant and growing research funding each year. In 2022, the University of Utah ranked 47th and Utah State University ranked 83rd out of 890 universities for total research and development (R&D) expenditure.[12] From FY 2019 to FY 2023, total research funding awarded to Utah's research institutions rose from $937 million to $1.2 billion. In FY 2023, the primary sources of federal funding were the Department of Health and Human Services for the University of Utah (contributed 58% of the University of Utah's total federal funding), and Department of Defense for Utah State University (which provided 45% of Utah State University's total federal funding).[13] This funding distribution reflects the specialized research areas of each institution: Utah State University leads the state in aerospace and defense research, while the University of Utah is renowned for its expertise in medical and life sciences.

Research output can be measured in many distinct aspects such as the number of publications, citations, number of patents, and startups that derive from the universities. Leading public and private universities in Utah greatly impact innovation, as evidenced by their high Innovation Impact rankings.[14] According to Clark (2024), using comprehensive metrics of innovation[15], the University of Utah ranked 41st, Brigham Young University 42nd, and Utah State University 127th among 177 leading universities in the U.S. These universities represent a high concentration of innovation impact for a state accounting for about 1% of the U.S. population. Brigham Young

Figure 5: Total R&D Expenditures of the University of Utah and Utah State University, 2013-2022



Source: The National Science Foundation (2024)

Table 1: Commercialization Metrics, by Institution, FY 2018-2022

(Annual Average*)

University	Patents Issued	Invention Disclosures	License Agreement	Startups
University of Utah	196	203	26	11
Utah State University	14	44	34	12
Brigham Young University	29	64	23	7

Note: *Numbers from Brigham Young University include data from 2020 only.
Sources: University of Utah's Technology Licensing Office, Utah State University's Office of Research, and Tech Transfer Office at Brigham Young University

University ranked 1st in innovation impact productivity among the "smaller universities" group.[16] Despite having a smaller research budget compared to larger universities, Brigham Young University produces a comparable research output, resulting in a high innovation impact productivity.

Another approach to evaluate the research output to innovation is to consider the number of patents, invention disclosures, license agreements, and startups originating from the institutions. The University of Utah and Utah State University provide services for faculty, staff, and students' intellectual property and work with industry leaders to implement the technology. Table 1 shows an annual average of the number of patents, invention disclosures, license agreements, and startups from FY 2018 to FY 2022.

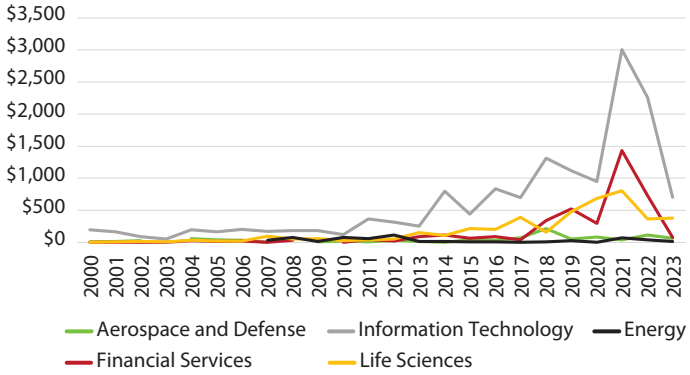
Financial Capital

Financial capital is crucial to an innovation ecosystem for several reasons - it supplies the critical resources required for R&D activities and supports the growth and scaling of startups and small businesses. Sustainable financial capital creates high-paying jobs and benefits, thereby attracting top talent in the associated industries. These advantages generate a virtuous cycle where successful innovations yield returns that are reinvested into innovation ventures, perpetuating further growth and development.

This area of innovation ecosystems includes the accessibility of various funding sources in Utah – including public (e.g., government grants), private (e.g., venture capital, corporate partnerships), nonprofit and other financial support mechanisms for startups and innovative projects. Other innovation ecosystem characteristics include state and local government support for innovation through the tax system and business incentive programs, the availability of federal, state, and local government funds available within the ecosystem, and government commercialization efforts and resources.

Figure 6: Utah's Invested Venture Capital by Industry,* 2000-2023

(Millions of Nominal Dollars)



Notes: *Industry definitions represent industries as defined by PitchBook. The Life Sciences industry shown in the graph includes the HealthTech and Life Sciences industry verticals from PitchBook. The Aerospace and Defense industry includes the following PitchBook industry verticals: Advanced Manufacturing, Cybersecurity, Robotics and Drones, and Space Technology.
Source: PitchBook Data (2024)

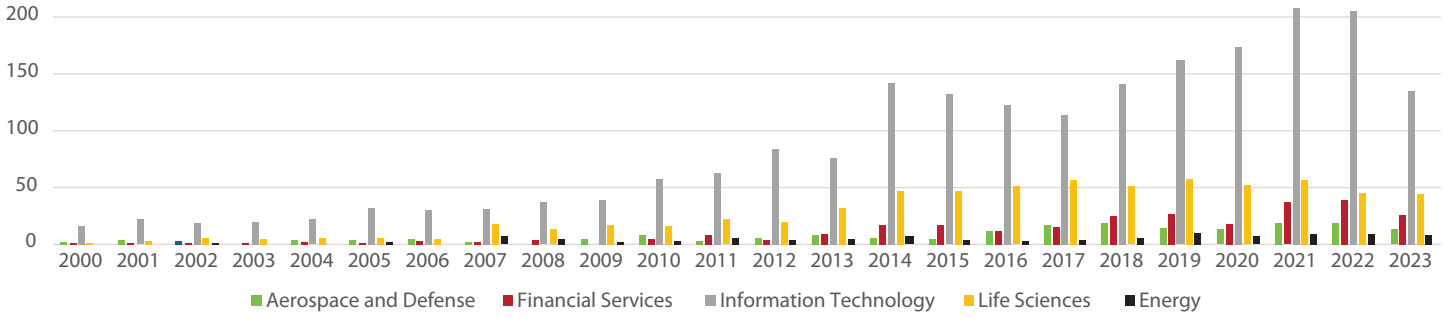
Venture Capital Attraction

According to the Innovation Intelligence Index, Utah ranks 4th in Business Profile, which includes metrics such as venture capital dollars, number of deals, foreign direct investment attractiveness, and proprietorship rates. This ranking indicates that Utah is a highly attractive destination for investors looking to invest in new businesses. The success rate of new companies in Utah is also outstanding. Stanford University constructed a random sample from a large database of venture capital-backed companies and found that in Utah, 1 out of 61 privately-held companies, or 1.65%, are unicorns (valued at or above $1 billion), almost 70% above the national average.[17]

Figures 6 and 7 illustrate that Utah's information technology sector attracts the most financial deals and capital, followed by financial services and life sciences. The ease of attracting capital in information technology is attributed, in part, to the shorter return on investment period, as noted in various in-depth interviews. Interestingly, although financial services garnered more capital, the number of venture capital deals in life sciences was significantly higher. This disparity highlights the structural differences between the industries: the Utah financial services sector is dominated by larger companies, whereas the Utah life sciences industry consists of smaller companies. The peak period for venture capital investment was from 2020 to 2022, with the information technology sector alone attracting $3.0 billion into Utah's economy in 2021. After 2022, the venture capital flows began to slow down, mirroring a global trend. The increase in interest rates elevated the cost and risk of investment, which in part led to a decline in venture capital activities.

In addition to venture capital from private sources, the state of Utah established the Utah Innovation Fund to partner with industry, venture capital firms, and higher education

Figure 7: Utah's Venture Capital Deal Counts by Industry,* 2000-2023



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Source: PitchBook Data (2024)

institutions. The fund supports promising startups across multiple industries. Industry partners gain access to cutting-edge research and technical expertise, while venture capital partners connect with startups at early stages, and higher education partners strengthen relationships and opportunities for student and faculty innovators. This fund demonstrates the state's commitment to bridging gaps in capital and fostering connections between industry and academia. Currently, the Utah Innovation Fund supports 10 Utah startups with $2 million in seed funding allocated overall to date (as of September 2024).

Local, State, and Federal Government Funding and Commercialization Programs

Government support can be crucial for the success in small businesses in innovation. From 2020 to 2022, Utah ranked 13th in the nation for average annual federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funding per $1 million of Gross Domestic Product (GDP).[18] Several agencies provide services and funding for innovation-led businesses in Utah.

The Utah Innovation Center aids small businesses by connecting them with federal decision-makers and offering comprehensive services, including consultations, training, proposal guidance, writing, editing, and submission. It also hosts regular workshops for small businesses planning to submit to specific SBIR/STTR agencies. It provides connections and resources with its partners, including industry associations, investment firms, university technology transfer offices, and former SBIR/STTR award-winning companies.

The Utah Technology Innovation Funding (UTIF) program provides support for small companies through microgrants to offset competitive SBIR/STTR application costs, and nonrecourse loans to bridge the gap between Phase I and Phase II SBIR/STTR R&D efforts.

Additionally, the Utah Small Business Development Center, with 12 locations statewide, offers free evaluations, advice, and affordable training programs to help cultivate essential business skills. For companies planning to sell their products to government agencies, the Utah APEX Accelerator, under the Governor's Office of Economic Opportunity, assists businesses in pursuing and securing government contracts. It facilitates the transfer of innovative technology to the defense industrial base, provides access to networks, resources, and potential partnerships, and offers training sessions to improve government contracting skills.

As previously mentioned, the state of Utah established the Utah Innovation Fund in 2023. The Utah Innovation Fund not only provides seed capital to companies with promising ideas tied to the state's higher education institutions in Utah, but it also works with the Utah Innovation Lab to commercialize technologies from these institutions and coordinate their commercialization activities at a state level.

Tax System and Business Incentive Programs

When considering government support through the tax system, Utah imposes a flat 4.55% corporate income tax and ranks 8th best overall in the Tax Foundations 2024 State Business Tax Climate Index.[19] While Utah's business incentives are considered average by the site selector community[20], the state offers several notable programs.

Examples of these business incentive programs include the Economic Development Tax Increment Financing (EDTIF), which offers a post-performance refundable tax credit for qualified companies in the targeted industries, including aerospace and defense, advanced manufacturing, financial services, life sciences and health care, and software and information technology. Additionally, with the rural modifications to the EDTIF program, known as REDTIF, projects within rural Utah qualify for more significant incentive amounts and may authorize additional, non-retail projects outside of the targeted industries in rural communities. The Industrial Assistance Account (IAA) provides a post-performance grant for the creation of high-paying jobs in Utah.[21] Additionally, the Utah New Market Tax Credit offers incentives of federal income tax credits in exchange for equity investments in specialized financial intermediaries.[22] The High-Cost Infrastructure Tax Credit (HCITC) supports significant

infrastructure investments in Utah, as well as renewable energy, oil and gas, and alternative energy installations. Eligible commercial projects can claim annual credits of 30% of infrastructure-related state revenue until the credit maximum is reached.[23] The state also provides credit for increasing research activities, which applies to R&D activities and expenditures. Beyond state-level incentives, many Utah counties and municipalities offer tax credits to qualifying companies.

While there are multiple tax incentives and credits for larger companies, smaller companies have fewer options. Larger companies can often take advantage of a wide range of incentives due to their substantial investment capabilities and the scale of their operations. Utah targets economic development opportunities with programs such as EDTIF, REDTIF, and IAA that produce significant post-performance benefits, such as extensive high-paying job additions and/or high capital investment in the state. Larger firms are more likely to receive these incentive benefits since they often provide lower risk and higher returns for the state.

Physical and Social Infrastructure

Innovation ecosystems possess both physical and social infrastructure. Physical infrastructure includes research and pilot facilities, co-working space, labs, incubation space, as well as innovation hubs and districts. Social infrastructure refers to entrepreneurial communities, social networks, and collaboration opportunities between innovation ecosystem actors. The research team also identified anchor companies and education institutions within each of Utah's innovation ecosystems.

Physical Infrastructure

Physical infrastructure provides essential facilities and services for businesses and entrepreneurs to thrive. It includes:

- Research and development facilities such as labs and research centers
- Innovation hubs, co-working spaces, and incubators
- Business parks, industrial zones, and innovation districts

Utah offers numerous co-working spaces, incubation services, and start-up support for small businesses. However, these infrastructures are less common in the state's rural areas. The state's innovation hubs and districts not only advance their respective fields but also positively impact the local community by generating high-paying jobs.

When leading anchor institutions and companies cluster and connect with startups, business incubators, and accelerators in close proximity, this forms an innovation district. Utah has several such areas where companies are clustered within the same industry. Notable examples include University of Utah's Research Park, Hill Air Force Base/Falcon Hill, Silicon Slopes (southern Salt Lake County/northern Utah County), Utah State University Innovation Campus, the Depot District, and the planned Utah Tech University Innovation District. The University of Utah's Research Park ranks 13th among innovation districts nationwide in terms of prosperity and opportunity surrounding the district due to its success in attracting skilled professionals, increasing income levels, and creating employment opportunities.[24] Innovation literature - such as Clark (2024) - identify University of Utah's Research Park as the only innovation district in Utah due to its maturity and successful characteristics. However, the research team identified more than just one innovation district in Utah even though these other ones may not be as mature in their development as the University of Utah's Research Park. Innovation districts can foster environments where companies thrive and develop innovative technologies and products through knowledge spillovers, access to specialized resources, and collaboration opportunities. These clusters attract investment and benefit from better market access and opportunities to expand.

The Utah government, via the Point of the Mountain State Land Authority, oversees the strategic real estate development opportunity at the site in Draper vacated by the state prison. This location, once developed, will serve as a one-stop service facility aimed at fostering innovation and technological advancement. Within The Point, Innovation Alley will act as an innovation district. This space is designed to enhance human interactions, promote technological innovation, support startups, and strengthen relationships among universities, businesses, and entrepreneurs. Convergence Hall will provide workspace, classrooms, and offices for universities, as well as educational opportunities for K-12 students. It will act as an innovation hub inside Innovation Alley.

An innovation hub is a physical or virtual space where innovators gather to share ideas, collaborate on projects, and develop solutions to problems. Hubs are often located within innovation districts, higher education institutions, or standalone areas dedicated to research. Examples of Utah's

Table 2: Potential Multi-disciplinary Innovation Districts and Hubs in Utah

Innovation Districts	Innovation Hubs
Innovation Alley at The Point*	Atwood Innovation Plaza at Utah Tech University
The Depot District	Convergence Hall at the Point*
Utah State University Innovation Campus	Innovation Academy at Utah Valley University
Utah Tech University Innovation District*	Roosevelt Innovation Hub
	Utah Innovation Lab
	Vernal Innovation Hub

Notes: 1) Those indicated with an asterisk are in a planning or development stage. 2) This table consists of potential innovation districts and hubs in Utah's broad innovation ecosystem while tables in Section 2 include potential innovation districts and hubs that are industry-aligned. 3) The planned Utah Tech University Innovation District involves an expansion around the Atwood Innovation Plaza.
Source: Kem C. Gardner Policy Institute and EDCUtah analysis of multiple data sources including those cited in Appendix 4.

innovation hubs that are industry or ecosystem specific include the Center for Medical Innovation at the University of Utah, Utah State University's Space Dynamics Laboratory, the Stena Center for Financial Technology at the University of Utah, Tech Ridge, BioMADE, U-EPIC Energy Center, and the San Rafael Energy Research Center. The Utah Innovation Lab represents a prime example of a multi-industry hub. The state government created the lab in 2023 and designed it to act as an incubator and accelerator for researchers and entrepreneurs looking to bring their technologies to market. The lab also helps commercialize technologies discovered, advanced, or developed at Utah's institutions of higher education. Other multi-industry hubs include the Vernal Innovation Hub and the Roosevelt Innovation Hub, which are industry agnostic coworking incubator centers in the Uintah Basin. Multi-industry hubs connected to higher education include the Atwood Innovation Plaza at Utah Tech University and the Innovation Academy at Utah Valley University. The Atwood Innovation Plaza consists of various resources such as Makerspace, a service for prototype manufacturing, a business resource center, an innovation guidance and solutions center, and a startup incubator. The Innovation Academy at UVU consists of various programs and initiatives across the organization to provide interdisciplinary, project-based, and hands-on learning opportunities to students.

Social Networks/Industry Collaborations

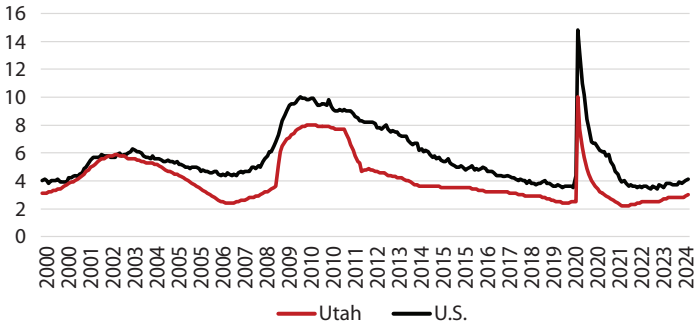
Industry collaborations facilitate the exchange of information, best practices, and emerging trends anchor companies, higher education institutions, government entities, and startups. These collaborations often involve pooling resources to support research and development initiatives. In Utah, examples of well-known industry associations include 47G, Utah Association of Financial Services, Silicon Slopes, BioUtah, and BioHive. There are also multi-industry collaborations in Utah such as the Wasatch Innovation Network. These networks help identify new business opportunities, keep organizations updated with the latest trends, and enable the sharing of resources, technology, and expertise. This collective approach can reduce costs and accelerate development.

Anchor Organizations

Anchor companies and organizations are the strength of Utah's innovation ecosystem. They invest in research and development, often partnering with universities, research institutions, and startups. Anchor companies can act as incubators or accelerators, providing startups with funding, mentorship, and access to the market. These large companies typically invest in workforce training and development programs, enhancing the skills of the local labor force and benefiting the small companies by spillover effects. Additionally, with their significant economic impact, anchor companies can influence

> *"The environment in Utah is generally very positive for innovation."*
>
> - Utah fintech pioneer

Figure 8: Unemployment Rates of the U.S. and Utah (%), 2000-2024



Source: U.S. Bureau of Labor Statistics, Unemployment Rate [UNRATE] and Unemployment Rate in Utah [UTUR], Retrieved from FRED, Federal Reserve Bank of St. Louis.

local and regional policies that promote innovation. All five identified ecosystems in Utah have anchor companies that are leading innovation in that specific field. Examples include Northrop Grumman Corporation, Goldman Sachs, Adobe, ARUP Laboratories, BioMerieux, Enbridge (formerly Dominion Energy), and Rocky Mountain Power.

Surrounding Characteristics

Other characteristics surround Utah's innovation ecosystem such as the economy, culture of innovation, and quality of life. An ecosystem's culture includes the environment supporting creativity, experimentation, and the pursuit of new ideas, solutions, and businesses. Each innovation ecosystem operates in an economy, measured by GDP growth, industry employment growth, and other economic indicators. The quality of life for innovators, entrepreneurs, and the workforce also shapes an innovation ecosystem.

Culture of Innovation

Utah is outstanding in this regard due to its entrepreneurial mindset, strong education and research institutions, and active networking and community support. According to the Business Dynamic Index from II3, the state ranks first in the establishment expansions to contractions ratio. This ratio measures whether employment gains from the growth of existing businesses outweigh the employment losses from business contraction. Utah's top ranking in this area indicates a dynamic and thriving business environment. The assessment of five ecosystems also confirms that culture of innovation is one of the main factors supporting Utah's innovation ecosystem.

Additionally, Utah ranks 3rd in establishment births to all establishment ratios. This metric measures the rate at which new business establishments are created relative to the total number of establishments. A high ranking signifies a vibrant entrepreneurial ecosystem where new startups are frequently emerging, further demonstrating the state's strong culture of innovation and its ability to foster new ideas. In-depth interviews reveal that the state benefits from private sector philanthropists and organizations collaborating with higher education to help students learn business skills and support startups. These partnerships are often sustained by generous donors and are supported by business professionals who share their best practices and help prepare students for the workforce. Utah's culture of innovation stands out for its collaborative spirit, with a supportive network of experienced business founders eager to assist new entrepreneurs.

In 2024, the state of Utah launched the Startup State Initiative to highlight the entrepreneurial mindset that exists in Utah and elevate it to new heights. The initiative helps startups, small businesses, and entrepreneurs at every stage of business by unifying the state's entrepreneurial ecosystem and simplifying government processes and regulatory burdens. At startup.utah.gov, the state curates hundreds of public and private entrepreneurial resources for Utah entrepreneurs, provides up-to-date community news and information, and highlights significant events across the state.

Economy

Utah ranks first in job growth to population growth and second in five-year personal income growth (22.3%) among all U.S. states, according to II3.[25] Following the COVID-19 pandemic, Utah's real GDP growth surpassed that of the U.S. The latest forecast predicts that U.S. real GDP growth will be 2.5% in 2024 and 2.2% in 2025, whereas Utah's real GDP growth will be 2.7% in 2024 and 2.6% in 2025.[26] Additionally, Utah has consistently maintained low unemployment rates. Figure 9 illustrates that Utah has outperformed the nation regarding unemployment over the past few decades.

Utah's exceptional performance in job growth, personal income growth, and real GDP growth, coupled with consistently low unemployment rates, underscores its robust economic resilience and leadership in comparison to other U.S. states.

Quality of Life

The II3 revealed that Utah ranks 1st among U.S. states in economic well-being.[27] However, it also shows that Utah has opportunities to enhance its environment to better support business proprietorship. In-depth interviews also highlighted several challenges that need addressing. Specifically, recruiting employees from outside the state has become increasingly difficult due to the elevated cost of housing (8th highest state median sales price of existing single-family homes), which deters potential talent.[28] Concerns about water shortages, air quality, and state politics also contribute to hesitancy among prospective employees. These factors can affect the attractiveness of Utah as a business location and potentially impact the state's ability to draw and retain skilled professionals.

However, Utah's strong economy and low unemployment rates contribute to a stable environment where businesses can thrive and allow companies to invest in research and development, further driving innovation. Utah's outdoor recreational opportunities, family-friendly environment, and a strong sense of community still attract talent and help maintain a positive work-life balance, which can be conducive to creativity and innovation.

SECTION 2:

Utah Innovation Ecosystem Profiles

Utah's broad innovation ecosystem fosters the growth and development of key industries and the formation of innovation districts and hubs. Within the broader Utah innovation ecosystem, at least five industry-focused ecosystems have emerged over time due to efforts at the state level to target specific industries for development, by natural market forces and competitiveness, and through the partnerships and programs developed by key actors and anchor institutions throughout the state. The five industry-aligned ecosystems in Utah identified by the research team, all with varying levels of maturity and accompanying innovation district and hubs, include the following:

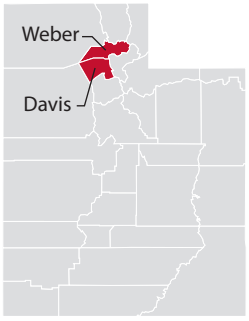
- Aeronautics, Space Exploration, and Defense Innovation Ecosystem
- Energy Production Innovation Ecosystem
- Finance, Fintech, and Headquarters Innovation Ecosystem
- Health Care and Life Sciences Innovation Ecosystem
- Technology and Information Systems Innovation Ecosystem

Aeronautics, Space Exploration, and Defense Innovation Ecosystem

The aeronautics, space exploration, and defense industry in Utah is anchored by key institutions such as Hill Air Force Base, the Utah Test and Training Range, and several major defense contractors like Northrop Grumman and Lockheed Martin. Hill Air Force Base, one of the largest employers in the state, plays a pivotal role in maintenance, repair, and overhaul operations for the U.S. Air Force. This, in turn, attracts numerous subcontractors and suppliers to the region, creating a robust ecosystem of aerospace activities. The Utah Test and Training Range provides extensive testing capabilities for weapons and systems. The state is also home to Falcon Hill Aerospace Research Park, one of the largest Enhanced Use Lease (EUL) initiatives in the Air Force and one of the largest commercial EULs in the Department of Defense.

Innovation in Utah's aeronautics, space exploration, and defense industry is fostered through a combination of public-private partnerships, educational programs, and investment in research and development. Initiatives like the Utah Aerospace Pathways program and collaborations with universities such as the University of Utah and Utah State University help build a skilled workforce ready to meet industry demands. The robust innovation ecosystem drives economic growth and prosperity in Utah.

Geographic Concentrations



Weber County has emerged as a significant location for the aerospace and defense industries, primarily due to its strategic location and robust infrastructure. The county is home to Hill Air Force Base. This presence has attracted a cluster of aerospace and defense companies, fostering a thriving ecosystem of innovation and employment in the region.

Davis County is a prominent center for aerospace and defense, primarily due to the presence of Hill Air Force Base. This strategic asset has attracted numerous aerospace companies, fostering a strong industrial base.

Potential Innovation Districts and Hubs

Hill Air Force Base (AFB) is a major U.S. Air Force base about 30 miles north of Salt Lake City. Hill AFB is the home of the Air Force Materiel Command's (AFMC) Ogden Air Logistics Complex (OO-ALC) which is the worldwide manager for a wide range of aircraft, engines, missiles, software, avionics, and accessories components. The OO-ALC is part of the Air Force Sustainment Center. The Falcon Hill Aerospace Research Park development next to Hill AFB represents a significant component of this innovation district.

Potential innovation hubs in this innovation ecosystem include the Utah State University Space Dynamics Lab, which has a rich heritage of providing air, space, ground, and cyber solutions to NASA and the Department of Defense. Capabilities include small satellite technologies, advanced spaceborne sensors and instruments, command and control, ground systems, and mission data processing.

The Miller Advanced Research and Solutions (MARS) Center at Weber State University launched in 2022 to bring various stakeholders together. Weber State University, 47G, other state and community partners, federal partners, and industry partners sponsored MARS to address production deficiencies in high-temperature materials deployment and the need to further develop hypersonic capabilities.

The 47G Utah Advanced Materials and Manufacturing Initiative (UAMMI) Institute could potentially be termed an innovation hub. It works to build a significant ecosystem for aerospace, defense, and cyber companies. Bringing together academic institutions, service providers, government, and community partners, they foster talent, fund entrepreneurship, and fuel innovation in Utah. The 47G UAMMI Institute is a

Table 3: Aeronautics, Space Exploration, and Defense Innovation Ecosystem Profile Characteristics

Areas of Specialization	
Aerospace and defense Advanced materials Aircraft component manufacturing and assembly	Unmanned systems (including advanced air mobility)
Geographic Concentrations	
Weber County	Davis County
Potential Innovation Districts	
Hill Air Force Base / Falcon Hill	
Potential Innovation Hubs	
USU Space Dynamics Laboratory 47G UAMMI Institute	MARS Center at Weber State University
Key Partnerships and Programs	
Utah Aerospace Pathways UNICOS	
Industry Alignment	
Aerospace and Defense	

Table 4: Aeronautics, Space Exploration, and Defense Innovation Ecosystem Anchor Institutions

Example Companies		
Albany Aerostructures Composites	JBT Aerotech	Parker Hannifin
BAE Systems	Kihomac	Petersen
Boeing	L3 Harris	Texas Instruments
Duncan Aviation	Lockheed Martin	TTM Technologies
Hexcel	Moog	Wavetronix
	Northrop Grumman	Williams International
Public Organizations		
Hill Air Force Base Dugway Proving Ground Tooele Army Depot	Military Installation Development Authority (MIDA)	
Industry Associations		
47G Aerospace States Association Impact Utah Mountain West Chapter of AUVSI Rapid Integration & Acceptance Center Utah Airport Operators Association Utah Back Country Pilots Association	Utah Business Aviation Association Utah Chapter of SAMPE Utah General Aviation Association Utah Manufacturing Association (UMA) Utah Manufacturing Extension Partnership Utah Defense Alliance	
Key Educational Institutions		
Davis Tech Ogden-Weber Tech Salt Lake Community College Aerospace University of Utah Aerospace Engineering	Weber State University Utah Valley University College of Aviation Utah State University	

Table 5: Aerospace and Defense Industry[1] Data, 2023

Industry Employment	5-Year Employment Growth	Industry Location Quotient[2]
33,632	23.0%	1.88

Notes: (1) The industry definition matches the industry definition used by GOEO. This may or may not align with other industry definitions, such as those of DWS, Gardner Institute, etc.
(2) The location quotient measure's Utah's specialization in this industry relative to the nation. A score greater than 1.0 means a higher concentration of activity in the industry in Utah than in the nation and signals economic strength.
Source: Bureau of Labor Statistics data accessed via JobsEQ

federal and state funded initiative to bring together public, private, community, industry and education partners to assure growth and sustainability of Utah's advanced material and manufacturing industry.

Key Partnerships and Programs

The Utah Aerospace Pathways program prepares high school students for aerospace careers through partnerships with industry leaders, schools, and government. It offers specialized training, hands-on experience, and certifications, creating a skilled workforce for Utah's growing aerospace sector and providing students with direct paths to high-demand jobs. Led by the University of Utah, the Utah Network for Integrated Computing and Semiconductor research and education (UNICOS) brings together stakeholders in the Utah semiconductor industry to provide workforce training and research to create a highly skilled workforce and generate innovation. Collaborative partners include public and private universities and colleges, as well as industrial partners such as Texas Instruments.

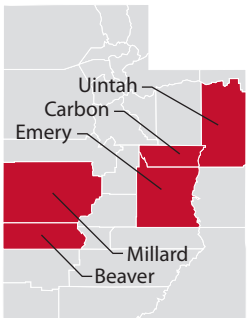
Industry Alignment

The primary industry alignment for the aeronautics, space exploration, and defense innovation ecosystem is centered around aerospace and defense. Home to several major aerospace companies and military installations, including Northrop Grumman, Boeing, and Hill Air Force Base, Utah has developed a robust ecosystem that supports both manufacturing and research and development in aerospace technologies. This sector benefits significantly from collaborations with local universities and research institutions, which drive forward innovations in composites, propulsion systems, and unmanned aerial systems.

Energy Production Ecosystem

Utah possesses abundant and diverse energy resources including large reserves of conventional nonrenew–able energy, several areas suitable for renewable resource development, and vast quantities of untapped unconventional oil shale and oil sand resources. Technology and innovation in energy production continue to be priorities for the state. Recently, Governor Cox set the goal of doubling Utah's energy output by 2034, reflecting public policy support for this ecosystem.[29]

Geographic Concentrations



Beaver County is rapidly growing in renewable energy with multiple solar power plants and wind farms. Beaver County's Milford Wind Corridor is one of the largest wind farms in Utah. The county also has access to the Roosevelt Hot Springs area, allowing for geothermal power generation. The planned Fervo Energy geothermal project, for example, will begin delivering power to the grid in 2026.[30]

Carbon and ***Emery*** counties have has historically been a significant center for mining and coal-fired power generation and is exploring opportunities for economic diversification, including potential developments in renewable energy and alternative production for coal, such as carbon fiber technology. Emery County hosts two large coal-fired power plants: the Hunter and Huntington plants. It also explores renewable projects, particularly in solar and wind energy.

Millard County is home to the Intermountain Power Plant (IPP), the largest power plant in Utah, which historically focused on coal but is transitioning to natural gas and hydrogen. Nearby In Delta, ACES Delta is developing a large renewable energy site to produce, store, and deliver green hydrogen energy.[31] Millard County is uniquely suited for traditional and renewable energy because of its abundant solar, wind, and geothermal resources.

Uintah County is part of the Uinta Basin, which is one of the largest producers of oil and natural gas in Utah. The basin's extensive oil, natural gas, oil shale, and oil sands resources make it a central area for nonrenewable fuel extraction.

Potential Innovation Districts and Hubs

The San Rafael Energy Research Center in Emery County, Utah serves as an innovation hub by focusing on advancing both conventional and renewable energy technologies. Situated in a resource-rich region, it supports research and development in oil, gas, solar, and wind energy. The center is a collaborative hub for scientists, engineers, and industry experts, aiming to enhance energy efficiency, sustainability, and the integration of renewables into existing grids. This initiative promotes energy independence and environmental sustainability in Utah.

Utah State University's Advancing Sustainability through Powered Infrastructure for Roadway Electrification (ASPIRE) research center focuses on advancing electric vehicle (EV) technologies and sustainable transportation. Funded by the National Science Foundation as an official Generation 4 Engineering Research Center, it develops innovative solutions like wireless charging, enhanced battery technologies, and smart mobility applications. By collaborating with industry, government, and academia, ASPIRE aims to make electric transportation more efficient and accessible, supporting broader environmental goals and positioning Utah as a leader in transportation research.

Other energy related potential innovation hubs in the state include USU's Bingham Research Center and Energy Technology Research & Innovation Lab (eTRI), along with the University of Utah's Energy Futures Hub. The University of Utah Energy Futures Hub consists of multiple research centers focused on various aspects of energy: Energy & Geoscience Institute, Utah Forge, Utah Energy and Power Innovation Center (U-EPIC), and the Wired Global Center.

Key Partnerships and Programs

The Utah Energy Pathways Scholarship Program provides financial support to students pursuing careers in the energy sector, focusing on fields like engineering, environmental science, and renewable energy technologies. This initiative aims to cultivate a skilled workforce aligned with Utah's goals for energy diversity and sustainability.

Table 6: Energy Production Innovation Ecosystem Profile Characteristics

Areas of Specialization	
Solar Power Generation Wind Power Generation	Petroleum, Coal, and Natural Gas Technologies
Geographic Concentrations	
Beaver County Carbon County Emery County	Millard County Uintah County
Potential Innovation Districts	
None	
Potential Innovation Hubs	
San Rafael Energy Research Center USU ASPIRE USU Bingham Research Center USU Energy Technology Research & Innovation Lab (eTRI)	University of Utah Energy Futures Hub (Energy & Geosciences Institute, Utah Forge, U-EPIC, and Wired Global Center)
Key Partnerships and Programs	
Utah Energy Pathways Scholarship Program Utah Energy Education Initiative	Energy and Infrastructure Related Tax Credits
Industry Alignment	
Energy	

Table 7: Energy Production Innovation Ecosystem Anchor Institutions

Example Companies	
AES Clean Energy Services	Intermountain Wind and Solar
Blue Raven Solar	Lumio
Enbridge (formerly Dominion Energy)	Rocky Mountain Power
Empire Solar Group	The Sinclair Companies
Energy Solutions	rPlus Energies
EP Systems	Vivint Solar
Intermountain Power Service Corp	Wheeler Power Systems
Public Organizations	
Utah Office of Energy Development	Utah Renewable Communities
Industry Associations	
Utah Clean Energy	Utah Petroleum Association (UPA)
Interwest Energy Alliance	Utah Association of Energy Engineers (AEE)
Utah Association of Energy Users (UAE)	
Key Educational Institutions	
University of Utah	Utah State University
Salt Lake Community College	Utah Tech University
Weber State University	

Table 8: Energy Production Industry[1] Data, 2023

Industry Employment	5-Year Employment Growth	Industry Location Quotient[2]
59,516	20.1%	1.25

Notes: (1) The industry definition matches the industry definition used by GOEO. This may or may not align with other industry definitions, such as those of DWS, Gardner Institute, etc. (2) The location quotient measure's Utah's specialization in this industry relative to the nation. A score greater than 1.0 means a higher concentration of activity in the industry in Utah than in the nation and signals economic strength.
Source: Bureau of Labor Statistics data accessed via JobsEQ

The Utah Energy Education Initiative aims to improve energy literacy through educational resources, workshops, and events focused on energy sources, sustainability, and environmental impact. Collaborating with schools and community groups, it equips Utah residents with the knowledge to make informed energy decisions. This initiative supports Utah's commitment to a sustainable energy future by promoting responsible energy practices and awareness of renewable options.

Utah offers various tax credits aimed at encouraging energy efficiency and the development of renewable energy infrastructure. The Renewable Energy Systems Tax Credit provides incentives for residential and commercial installations of solar, wind, geothermal, and biomass energy systems. Additionally, the Commercial Property Assessed Clean Energy (C-PACE) program allows commercial property owners to finance energy efficiency and renewable energy improvements through a voluntary assessment on their property tax bill. The High Cost Infrastructure Tax Credit (HCITC) is designed to offset the costs of infrastructure development in rural areas for projects that include electrical, road, water, or gas creation or improvements. Additional tax credits include: the Alternative Energy Development Incentive (AEDI), the Energy Systems Installation Tax Credit, and the Clean Fuel Vehicle and Infrastructure Tax Credit.

Industry Alignment

Utah's energy industry is diverse, integrating traditional nonrenewable with expanding renewable energy sources. The state is a significant producer of oil, natural gas, and coal, but has increasingly invested in solar, wind, and geothermal energy to align with sustainable practices. These efforts reflect Utah's commitment to balancing energy independence with environmental stewardship.

Finance, Fintech, and Headquarters Innovation Ecosystem

Forty-one banking institutions have headquarters in Utah and an additional 17 have offices here. They consist of national, regional, community, and industrial banks. Assets of those headquartered in Utah exceed $1 billion. Fifteen of 24 industrial banks in the U.S. are headquartered in Utah. They account for 85.6% of industrial bank assets. The state's credit union industry includes 56 institutions with over $54 billion in assets. There are also many insurance companies and other financial firms in Utah.[32]

Multiple factors such as a concentration of industrial banks, youthful population, and skilled workforce have led to a concentration of fintech firms in Utah, especially in and around Salt Lake County. While Utah's fintech industry is small compared to the broader tech and financial services sectors, it appears well-positioned for growth.

Geographic Concentrations

Salt Lake City has emerged as a dynamic location for finance, fintech, and corporate headquarters, driven by a business-friendly environment, skilled workforce, and strategic location in the western United States. The city hosts numerous financial institutions, innovative fintech startups, and major corporate headquarters, creating an ecosystem for economic growth.

Similar to the concentration of corporate concentration in Utah's capital city, the entire Salt Lake County has developed into a hotbed of economic activity, especially for finance, fintech, and corporate headquarters.

Table 9: Finance, Fintech, and Headquarters Innovation Ecosystem Profile Characteristics

Areas of Specialization	
Financial Technology (Fintech)	Venture Capital
Industrial Banking	
Geographic Concentrations	
Salt Lake City	
Salt Lake County	
Potential Innovation Districts	
None	
Potential Innovation Hubs	
The Stena Center for Financial Technology	
Key Partnerships and Programs	
Financial literacy in secondary education	
Multiple higher ed student-run investment portfolios	
Westminster University's Center for Financial Wellness	
Industry Alignment	
Financial Services and Fintech	Headquarters and Shared Services

Table 10: Finance, Fintech, and Headquarters Innovation Ecosystem Anchor Institutions

Example Companies		
Acima Credit	Global Payments	MX
American Express	Goldman Sachs	Pricewaterhouse-Coopers
Deloitte & Touche	JP Morgan Chase Bank	SelectHealth
Discover Products	KeyBank	Sutter Connect
Divvy (Bill.com)	KPMG	Wells Fargo Bank
Ernst & Young	LendingClub	Zions Bancorporation
E-Trade	Merrill Lynch	
Fidelity Investments	Morgan Stanley	
Public Organizations		
None		
Industry Associations		
Association for Corporate Growth–Utah Chapter	The Utah Bankers Association	
MountainWest Capital Network	Utah Association of Financial Service	
The Financial Planning Association of Utah		
Key Educational Institutions		
Brigham Young University	University of Utah	

Table 11: Financial Services Industry[1] Data, 2023

Industry Employment	5-Year Employment Growth	Industry Location Quotient[2]
101,616	14.6%	1.04

Notes: (1) The industry definition matches the industry definition used by GOEO. This may or may not align with other industry definitions, such as those of DWS, Gardner Institute, etc. (2) The location quotient measure's Utah's specialization in this industry relative to the nation. A score greater than 1.0 means a higher concentration of activity in the industry in Utah than in the nation and signals economic strength.
Source: Bureau of Labor Statistics data accessed via JobsEQ

Potential Innovation Districts and Hubs

The Stena Center for Financial Technology at the University of Utah, supported by Stena Group, seeks to bridge academia and the fintech industry and acts as an innovation hub by focusing on advancing financial technology through education, research, and industry collaboration. It offers students hands-on learning and connects them with industry experts.

Key Partnerships and Programs

Utah earned an "A" grade in financial literacy from the Nation's Report Card, as the first state requiring a half-credit general financial literacy course to graduate from high school. Many higher education institutions provide students opportunities to help manage investment portfolios. The Center for Financial Wellness at Westminster University provides experiential learning and access to a financial lab facility to students in tax preparation and financial advocacy. These and other examples highlight key partnerships and programs in this ecosystem.

Industry Alignment

Utah's financial services industry is marked by a blend of innovation and legacy, making it a key center for both fintech startups and established institutions like Goldman Sachs and American Express. Favorable state regulations for industrial loan companies (industrial banks) have led to the establishment of many industrial banks in Utah.[33] These and other banks create demand for fintech products and services. The state's growing and dynamic fintech industry fosters advances in digital/open banking, payments, and payments infrastructure, among other areas.

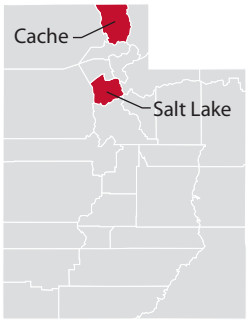
Utah has also become an attractive location for headquarters and shared services. The state offers a business-friendly environment with low operational costs, a favorable tax structure, and a highly educated workforce, which are key factors for companies looking to establish their headquarters or shared service centers. Additionally, Utah's quality of life and scenic beauty contribute to its appeal, aiding companies in attracting and retaining talent.

Health Care and Life Sciences Innovation Ecosystem

Utah's health care and life sciences ecosystem thrives on innovation, supported by top-tier research institutions like the University of Utah and a flourishing startup culture. This synergy has positioned Utah favorably in biotech and medical technology, with significant advancements in genetics, personalized medicine, and digital health. The concentration of health care and life sciences enterprises along the Wasatch Front fosters a collaborative environment that speeds the development of new technologies.

Investment from both public and private sectors is pivotal in nurturing this ecosystem, promoting continuous innovation in patient care and health management. Utah's integrated approach propels medical technology forward and sets new standards in health care efficiency and delivery.

Geographic Concentrations



Salt Lake County is a center for health care and life sciences, featuring a dense concentration of hospitals, research institutions, and biotech companies. This clustering promotes collaboration and innovation, with major facilities like the University of Utah and Intermountain Medical Center driving advancements. The presence of numerous startups and labs further strengthens the region's innovation capabilities.

Cache County is expanding in health care and life sciences, driven by Utah State University and Logan Regional Hospital. Notable life science and biotechnology companies like Thermo Fisher Scientific and Cytiva act as anchor institutions. USU's Research Foundation promotes research and technology commercialization across a broad array of industries, including life sciences.

Potential Innovation Districts and Hubs

The University of Utah Research Park is the most renowned innovation district in Utah, known for its research, technology development, and business innovation affiliated with the University of Utah. Research Park fosters many university-industry collaborations and enables development of innovation.

The Depot District in Salt Lake City, Utah, has evolved from a historical railroad hub into a dynamic center of urban renewal and economic activity. The area hosts an array of businesses including biotech startups and medical research facilities.

Table 12. Health Care and Life Sciences Innovation Ecosystem Profile Characteristics

Areas of Specialization	
Genetic Research	Medical Device Manufacturing
Personalized Medicine	Nutritional Products
Geographic Concentrations	
Salt Lake County	
Cache County	
Potential Innovation Districts	
University of Utah Research Park	
Depot District	
Potential Innovation Hubs	
BioMADE	University of Utah Center for Medical Innovation
Altitude Lab	
Utah Nanofab	
Key Partnerships and Programs	
Utah Life Sciences Medical Innovations Pathway	
Industry Alignment	
Life Sciences	

Table 13: Health Care and Life Sciences Innovation Ecosystem Anchor Institutions

Example Companies		
ARUP Laboratories	Laborie Medical Technologies	Pra Health Sciences
BD (Becton Dickinson)	Merit Medical Systems	RB Health Manufacturing
BioMerieux	Moog Medical Devices Group	Recursion Pharmaceuticals
Biomerics	Moxtek	Sorenson Genomics
Blackrock Neurotech	Myriad Genetic Laboratories	Stryker
Cytiva	Nelson Laboratories	Thermo Fisher Scientific
Deseret Laboratories	Ortho Development	Ultradent Products
Edwards Lifesciences	Otto Bock Healthcare	Varex Imaging
Fresenius USA Manufacturing	PolarityTE	
GE Healthcare		
ICU Medical		
Public Organizations		
University of Utah Therapeutics Accelerator Hub (U2TAH)		
USU Research Foundation		
Industry Associations		
BioUtah	Medical Device Manufacturers Association	
BioHive		
BioInnovations Gateway	Utah Health Care Association	
Key Educational Institutions		
University of Utah	Weber State University	
Brigham Young University	Westminster University	
Utah Valley University	Southern Utah University	
Utah State University	Utah Tech University	

BioMADE in Utah is an innovation hub focusing on developing sustainable technologies. Part of the Manufacturing USA network, it leverages Utah's strong tech infrastructure and life sciences ecosystem to foster collaboration and drive advancements in biological manufacturing.

Table 14: Life Sciences Industry[1] Data, 2023

Industry Employment	5-Year Employment Growth	Industry Location Quotient[2]
48,165	26.5%	1.59

Notes: (1) The industry definition matches the industry definition used by GOEO. This may or may not align with other industry definitions, such as those of DWS, Gardner Institute, etc.
(2) The location quotient measure's Utah's specialization in this industry relative to the nation. A score greater than 1.0 means a higher concentration of activity in the industry in Utah than in the nation and signals economic strength.
Source: Bureau of Labor Statistics data accessed via JobsEQ

Altitude Lab is an incubator focused on accelerating health sciences innovation. Located in Salt Lake City, Utah, it offers startups lab space, mentorship, and industry connections. Specializing in biotechnology and medical innovations, Altitude Lab enhances Utah's life sciences ecosystem by helping transform new ideas into practical health care solutions.

Utah Nanofab at the University of Utah is a leading facility for nanotechnology research, providing advanced tools for the development of micro and nanoscale devices. It supports both academic and commercial projects, enhancing innovations in electronics, photonics, and biotechnology. This facility is pivotal in transforming theoretical research into practical applications, thereby boosting both technological advancement and economic development in the region.

The University of Utah Center for Medical Innovation (CMI) is a multidisciplinary hub that fosters innovation in health care and medical technology. It brings together students, faculty, staff, and the local entrepreneurial community to develop cutting-edge solutions for medical challenges. It offers resources like prototyping facilities, mentorship programs, and funding opportunities to support the entire innovation lifecycle—from idea conception to commercialization.

Key Partnerships / Programs

The Utah Life Sciences Medical Innovations Pathway program equips high school students with skills for careers in life sciences through hands-on experiences and specialized coursework. By partnering with industry leaders, the program prepares students for direct entry into the workforce or further education in fields like biotechnology and medical manufacturing, addressing the demand for skilled professionals in Utah's growing life sciences sector.

Industry Alignment

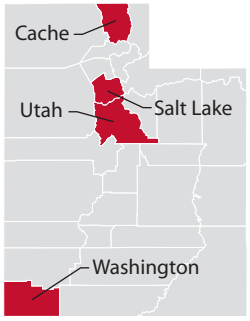
Utah's life sciences industry is rapidly growing, supported by strong collaborations between research institutions, startups, and established companies. Specializing in medical devices, biotechnology, and pharmaceuticals, the sector benefits from groundbreaking research from the University of Utah and a network of innovative biotech firms.

Technology and Information Systems Innovation Ecosystem

Utah is a growing center for technology and information systems innovation, anchored by key institutions like the University of Utah and major tech companies like Adobe and Domo. The Silicon Slopes industry association fosters a collaborative tech ecosystem with numerous startups and access to venture capital, while the universities contribute through cutting-edge research and industry partnerships.

The state supports innovation through public-private partnerships, tech incubators, funding, and initiatives like the Utah Innovation Center, Utah Technology Innovation Funding, and USHE's Utah Innovation Fund. Events such as the Silicon Slopes Tech Summit facilitate collaboration and idea exchange. This comprehensive approach creates a dynamic environment for tech growth and continued innovation.

Geographic Concentrations



Cache County is a burgeoning tech location, fueled by Utah State University's skilled graduates and a supportive business environment. The area attracts companies in software development, biotechnology, and agricultural technology.

Salt Lake County is a thriving tech center, bolstered by its robust infrastructure, talented workforce, and supportive business climate. The region is home to numerous tech companies, from startups to industry leaders, particularly in software development, biotech, and cybersecurity. The presence of major universities and research institutions further enhances its innovative landscape.

Utah County is part of Silicon Slopes, a booming tech center with a vibrant startup culture and numerous tech companies specializing in software, IT, and biotechnology. The region's strong ties to local universities and a highly skilled workforce drive innovation and growth.

Washington County is an emerging tech center, attracting a growing number of tech companies and startups. The area's favorable business climate, combined with its beautiful surroundings and quality of life, makes it an appealing destination for innovation and entrepreneurship. With a focus on software development and renewable energy technology, Washington County is steadily gaining recognition in the tech industry.

Table 15: Technology and Information Systems Innovation Ecosystem Profile Characteristics

Areas of Specialization	
Software Development	Cloud Computing
Cybersecurity	Artificial Intelligence and Machine Learning
Data Analytics	
Geographic Concentrations	
Cache County	Utah County
Salt Lake County	Washington County
Potential Innovation Districts	
Silicon Slopes	
Potential Innovation Hubs	
Tech Ridge	
RevRoad	
Key Partnerships and Programs	
Utah STEM Action Center	
Tech-Moms	
Industry Alignment	
Information Technology	

Table 16: Technology and Information Systems Innovation Ecosystem Anchor Institutions

Example Companies		
Adobe	Instructure	Podium
Ancestry	Lucid Software	Qualtrics
BambooHR	MasterControl	Texas Instruments
Domo	Meta	Xactware
eBay	Overstock	
Entrata	Pluralsight	
Public Organizations		
None		
Industry Associations		
Silicon Slopes	Utah Tech Leads	
Women Tech Council	Utah Tech Entertainment Alliance	
Utah Technology Council		
Key Educational Institutions		
University of Utah	Weber State University	
Brigham Young University	Westminster University	
Utah Valley University	Southern Utah University	
Neumont College	Utah Tech University	
Utah State University		

Table 17: Information Technology Industry[1] Data, 2023

Industry Employment	5-Year Employment Growth	Industry Location Quotient[2]
86,713	19.1%	1.31

Notes: (1) The industry definition matches the industry definition used by GOEO. This may or may not align with other industry definitions, such as those of DWS, Gardner Institute, etc. (2) The location quotient measure's Utah's specialization in this industry relative to the nation. A score greater than 1.0 means a higher concentration of activity in the industry in Utah than in the nation and signals economic strength.
Source: Bureau of Labor Statistics data accessed via JobsEQ

Potential Innovation Districts and Hubs

Silicon Slopes refers not only to an industry association but also to the concentration of technology companies centered around southern Salt Lake County and northern Utah County. It encompasses a thriving area of tech firms, venture capital investment, research institutions, and supportive infrastructure, making it a dynamic center for technological innovation and economic growth in Utah.

Located on the former St. George Airport site overlooking downtown St. George, the 180-acre Tech Ridge Master Plan redefines the modern urban center. This smart, mixed-use development draws innovative tech companies and amplifies their ability to attract and retain top talent. The mix of workspaces, shops, and eateries promote a dynamic social lifestyle, including 60 acres of easily accessible trails, parks, and open space, all surrounded by the striking red cliffs of Southern Utah.

RevRoad, based in Utah, is a venture services firm that helps startups grow by providing marketing, sales, legal, and financial support in exchange for equity. This unique approach allows entrepreneurs to focus on their core business while accessing essential resources. RevRoad's strong network and collaborative environment make it a key player in Utah's startup ecosystem, driving innovation and economic growth.

Key Partnerships / Programs

The Utah STEM Action Center enhances STEM education and workforce development by partnering with schools, industry leaders, and community organizations. It promotes innovative teaching methods and provides resources to engage students in STEM fields. By increasing student proficiency and expanding access to STEM opportunities, the center helps prepare a skilled workforce to meet the demands of Utah's growing tech economy.

Tech-Moms is a program that equips mothers with tech skills and computer training to help them enter or re-enter the workforce. It provides hands-on learning, mentorship, and networking opportunities, empowering women to secure tech-related jobs and contribute to diversifying the industry.

Industry Alignment

Utah's information technology industry has become a dynamic center for tech innovation and growth. The state attracts a blend of major companies and startups focused on software development, cybersecurity, and financial technology. Fueled by a young, skilled workforce and strong university support, Utah excels in AI, machine learning, and cloud computing. The state's business-friendly climate and high quality of life continue to attract talent and investment, reinforcing its position as a national leader in IT.

SECTION 3:

Opportunity Analysis

Research evaluating the maturity of Utah's innovation ecosystems identified numerous potential strengths and gaps. This analysis included secondary research from publicly available sources such as: the Bureau of Labor Statistics, Utah System of Higher Education, Utah Department of Workforce Service, and many others. Appendix 3 contains insight summaries from in-depth interviews with innovation ecosystem pioneers and other leaders, while Appendix 4 contains data summaries from the quantitative analysis. Both sets of information inform the opportunity analysis.

The opportunity analysis of the five innovation ecosystems in Utah reveals several common strengths: human capital development, strong or established anchor companies, social capital and networks, and a culture of innovation. Utah's broad innovation ecosystem benefits significantly from the robust support of higher education institutions. Universities, technical colleges, and community colleges offer a range of degrees and programs that effectively serve each ecosystem, from directly producing innovation to supporting the workforce. Anchor companies in Utah are pivotal in collaborating with government and educational institutions to foster innovation. Additionally, Utah's culture of innovation creates an environment that encourages and supports creativity, experimentation and implementation of new ideas.

Besides the strengths, potential gaps also exist within Utah's five innovation ecosystems. Ecosystems such as health care/life sciences, energy production, and aeronautics/space exploration/defense have struggled to attract venture capital, in contrast to the information technology and financial services sectors, which enjoy more stable capital inflows. Due in part to this capital shortfall, those three ecosystems also face a need for additional lab spaces, incubation, and research facilities. The table that follows summarizes the potential strengths and gaps in Utah's five identified industry-aligned innovation ecosystems.

Table 18: Summary of Potential Strengths and Potential Gaps in Utah's Industry-aligned Innovation Ecosystems

Potential Strength
Potential Gap

	Industry-aligned Innovation Ecosystem				
	Aeronautics, Space Exploration, and Defense	Energy Production	Finance, Fintech, and Headquarters	Health Care and Life Sciences	Technology and Information Systems
Human Capital					
Pre-graduation	Potential Strength, Potential Gap	Potential Strength	Potential Strength, Potential Gap	Potential Strength	Potential Strength
Skill Development (Post-Grad/ Non-accredited) & Business Creation					
R&D Activities and Commercialization					
Financial Capital					
State/Local Tax System and Business Incentive Programs			Potential Gap		
Local/State/Federal Government Funding & Commercialization Programs	Potential Gap				
Venture/Other Capital Availability	Potential Gap	Potential Gap	Potential Strength	Potential Gap	Potential Strength
Infrastructure					
Physical (Incubation/lab space, research facilities, innovation hubs and districts)	Potential Gap	Potential Gap	Potential Gap	Potential Strength, Potential Gap	
Social (Networks and collaboration among actors)	Potential Strength	Potential Strength			Potential Gap
Anchor Organizations	Potential Strength		Potential Strength	Potential Strength	Potential Strength
Surrounding Characteristics					
Culture of Innovation			Potential Strength	Potential Strength	Potential Strength
Economy					
Quality of Life					

Note: Blank cells above represent neutral characteristics. Some ecosystems display both strengths and gaps within the same characteristic due to the varying elements within a characteristic. For instance, the Aeronautics, Space Exploration, and Defense ecosystem lists pre-graduation as both a potential strength and a potential gap. While Utah's higher education institutions provide numerous programs to prepare students for careers in these fields, a potential gap has been identified in education related to composite material manufacturing.

Aeronautics, Space Exploration, and Defense Innovation Ecosystem

POTENTIAL STRENGTHS

Human Capital: Pre-Graduation

Utah's educational institutions, including the higher education system and technical colleges, have thriving programs that equip students with education and experiences that encourage growth in the aeronautics, space exploration, and defense innovation ecosystem. These institutions offer several programs designed to prepare students for careers in aerospace and defense. A few examples include: Utah State University's Aerospace Engineering Program, the Utah Aerospace Pathways program administered by USHE, and the multiple specialized programs in aerospace, defense, flight, cyber security, and other related areas, offered throughout the state.

USHE institutions provide extensive resources to support the growth of businesses and the development of in-demand skills in the aerospace and defense sectors, including business incubation, technology transfer, specialized training programs, and collaborative partnerships. A few examples include: Space Dynamics Laboratory at Utah State University, Rollins Center for Entrepreneurship at Brigham Young University, and Utah Tech Startup Incubator at Utah Tech University. There are also many research labs in both of Utah's R1 institutions that drive cutting-edge innovation with many collaborating closely with the federal government such as the Aerospace Hub at the University of Utah, and the Space Dynamics Laboratory at Utah State University.

Infrastructure: Social (networks and collaboration among actors)

Utah has many industry associations and nonprofit organizations dedicated to the advancement of the aeronautics, space exploration, and defense innovation ecosystem in Utah. 47G works to build the aerospace, defense, and cyber ecosystem, bringing together academic institutions, service providers, government, and community partners to foster talent, fund entrepreneurship, and fuel innovation in Utah. Additionally, Utah Airport Operators Association, Utah Manufacturing Extension Partnership, and Utah State University Aerospace & Space Dynamics Lab are just a few other organizations working to support the ecosystem in Utah.

Infrastructure: Anchor Organizations

Utah is home to some of the most well-known global companies in the aerospace and defense ecosystem and is also home to many strategic military bases of national importance, such as Hill Airforce Base. With an international airport and continued investment from companies like Boeing, Northrop Grumman, and Lockheed Martin, this ecosystem continues to show signs of growth.

POTENTIAL GAPS

Financial Capital: Government Funding Programs

Few government funds are available to support the development of aeronautics, space exploration, and defense companies in Utah. Statewide and local level programs favor larger companies. Capital and manufacturing space are limited for small aeronautics, space exploration, and defense companies in Utah; however, the local ecosystem can tap into federal funds, such as Small Business Innovation Research (SBIR) and utilize free coaching services provided by the state-sponsored Utah Innovation Center.

Financial Capital: Venture/Other Capital Availability

Obtaining funding from venture capital or private equity funds is difficult in the aeronautics, space exploration, and defense innovation ecosystem. This appears to be true in all regions of the U.S., not just in Utah. Venture capitalists and private equity funds tend to favor companies with lower capital intensity and quicker returns on investment, making aerospace and defense a riskier investment.

Infrastructure: Physical (Incubation/lab space, research facilities, innovation hubs and districts)

While there are dozens of co-working spaces, incubation services, and start-up support for small businesses, there is not a substantial amount of manufacturing space and lab space specifically for the aeronautics, space exploration, and defense innovation ecosystem. Additionally, these assets are less common in rural areas of Utah.

Human Capital: Pre-Graduation

While Utah universities and schools offer robust programs in the aeronautics, space exploration, and defense innovation ecosystems, one possible gap is in composite material manufacturing, as identified by a local industry expert in aeronautics, space exploration, and defense. Given its more frequent use in aeronautics, space exploration, and defense applications, and the needed specialty in the state, educational institutions offering this type of curriculum may be beneficial to Utah's workforce.

Energy Production Innovation Ecosystem

POTENTIAL STRENGTHS

Human Capital: Pre-Graduation

Utah's educational institutions, including the higher education system and technical colleges, have thriving programs that equip students with education and experiences that encourage growth in the energy production innovation ecosystem. These institutions offer several programs designed to prepare students for careers in energy production. A few examples include: the University of Utah U-EPIC Energy & Workforce Partnership Program, the Utah Energy Pathways Scholarship Program, and the Utah Energy Education Initiative.

Infrastructure: Social (networks and collaboration among actors)

Utah has many industry associations and nonprofit organizations dedicated to the advancement of the energy production innovation ecosystem in Utah. Just a few include: Utah Clean Energy, Utah Association of Energy Users (UAE), and Utah Association of Energy Engineers (AEE).

POTENTIAL GAPS

Financial Capital: Venture/Other Capital Availability

Obtaining funding from venture capital or private equity funds is difficult in the energy production innovation ecosystem. This appears to be true in all regions of the U.S., not just Utah. Venture capitalists and private equity funds tend to favor companies with lower capital set-up costs and quicker returns on investment, making energy a riskier investment.

Infrastructure: Physical (Incubation/lab space, research facilities, innovation hubs and districts)

The San Rafael Energy Research Center is a major strength in offering research services and resources for energy production in Utah, and while there are dozens of co-working spaces, general incubation services, and start-up support for small businesses, there is a gap in manufacturing space specifically for energy production. Additionally, these assets are less common in rural areas.

Finance, Fintech, and Headquarters Innovation Ecosystem

POTENTIAL STRENGTHS

Human Capital: Pre-Graduation

Utah's educational institutions have thriving programs that equip students with education and experiences that encourage growth in the finance, fintech, and headquarters innovation ecosystem. These institutions offer several programs (such as those in economics and finance) designed to prepare students for careers in financial services.

USHE institutions provide extensive resources to support the growth of businesses and the development of in-demand skills in the finance and fintech sectors, including business incubation, technology transfer, specialized training programs, and collaborative partnerships. A few examples include: the Huntsman Center for Entrepreneurship at Utah State University, Innovative Studio at Weber State University, and the Rollins Center at Brigham Young University. However, the University of Utah is the only institution offering a degree emphasizing fintech.

Infrastructure: Anchor Organizations

Utah is home to well-known global companies in the finance, fintech, and headquarters innovation ecosystem. Utah has the highest number of industrial banks in the nation with 15 active chartered industrial banks, eight of which are in the top 10 industrial banks in the country by asset size. Utah has not only grown some of the most innovative fintech companies such as Divvy, LendingClub, and Snap Finance, but it has also attracted key finance giants such as Goldman Sachs, Wells Fargo Bank, and JP Morgan Chase.

Financial Capital: Venture/Other Capital Availability

Obtaining funding from venture capital or private equity funds can be more difficult in finance, but fintech companies that more heavily utilize technology have easier access to capital. Venture capitalists and private equity funds tend to favor companies with lower capital set-up costs and quicker returns on investment, making fintech a less risky option compared to more capital-intensive industries. Divvy is an example of a Utah-based fintech company that was supported by a local VC company that led to a recent successful acquisition by Bill.com.

Surrounding Characteristics: Culture of innovation

Utah has a legacy culture in innovation, not only in the finance, fintech, and headquarters innovation ecosystem, but in other ecosystems that directly support this ecosystem, such as technology. This focus on innovation has led to Utah's strong economy, growth in finance companies, development of industry associations, and educational assets that all come together to advance the ecosystem in the state.

POTENTIAL GAPS

Financial Capital: State/Local Tax System and Business Incentive Programs

Few government funds are available to support the development of finance and fintech companies in Utah. Statewide and local level programs favor larger companies. Capital is limited for small finance and fintech companies in Utah; however, the local ecosystem can tap into federal funds, such as SBIR, with the help of the Utah Innovation Center.

Infrastructure: Physical (innovation districts and hubs) and Social (networks and collaboration among actors)

Utah has a few industry associations and nonprofit organizations dedicated to the advancement of the finance, fintech, and headquarters innovation ecosystem in Utah; however, these do not appear to be as strong as in other ecosystems. A few examples include: Association for Corporate Growth–Utah Chapter, The Financial Planning Association of Utah, and The Utah Bankers Association. These are niche organizations dedicated to their sub-industry but do not appear to be advocates of the broader finance, fintech, and headquarters innovation ecosystem. Additionally, while many financial services companies, including many fintechs, are located in Salt Lake County and while there are some universities offering gathering places for finance students and entrepreneurs (such as the Stena center which just launched The Stena fintechXstudio, an early stage fintech incubator and accelerator), there does not appear to be a finance innovation district in the state.

Human Capital: Pre-graduation

While many Utah universities offer electives, minors, and majors in economics and finance, there are few programs that fully integrate finance and tech curricula for fintech career pathways.

Health Care and Life Sciences Innovation Ecosystem

POTENTIAL STRENGTHS

Human Capital: Pre-Graduation

Utah's educational institutions, including the higher education system and technical colleges, have thriving programs that equip students with education and experiences that encourage growth in the health care and life sciences innovation ecosystem. These institutions offer several programs designed to prepare students for careers in health care and life sciences. A few examples include: the University of Utah Pathway Programs for medical students, the Sorenson Legacy Foundation Center for Clinical Excellence at Utah State University, and the ASM-WSU Microbiology Certificate Program for Clinical Microbiology and Weber State University.

Utah's health care and life sciences innovation ecosystem has major centers of research, such as Research Park at the University of Utah, and is also home to large health care systems such as the Huntsman Cancer Institute and the University of Utah Medical School. Brigham Young University also announced in 2024 the establishment of a medical school in Provo.

Infrastructure: Physical (innovation hubs/districts)

The University of Utah Research Park is a hub for research, technology development, and business innovation affiliated with the University of Utah, fostering university-industry collaboration. Primary Children's hospital and the Huntsman Cancer Institute reside in Research Park. This innovation district has received national recognition.

Infrastructure: Anchor Organizations

Utah is home to well-known companies in the health care and life sciences innovation ecosystem. Legacy companies such as bioMérieux, ARUP Laboratories, BD (Becton Dickinson), and Thermo Fisher Scientific continue to invest in Utah. Newer companies such as Owlet and Recursion Pharmaceuticals are also growing Utah's health care and life sciences innovation ecosystem. Utah's anchor organizations often support Utah's key health care and life sciences specialities, such as medical device manufacturing, diagnostics, and genetics.

Surrounding Characteristics: Culture of Innovation

Utah has a culture of innovation, not only in the health care and life sciences ecosystem, but in other ecosystems that directly support health care and life sciences, such as technology. This focus on innovation has led to Utah's strong economy, growth in health care and life sciences companies, development of industry associations, and educational assets that all come together to advance the ecosystem in the state.

POTENTIAL GAPS

Financial Capital: Venture/Other Capital Availability

Obtaining funding from venture capital or private equity funds is difficult in the health care and life sciences innovation ecosystem. This appears to be true in all regions of the U.S., not just Utah. Venture capitalists and private equity funds tend to favor companies with lower capital set-up costs and quicker returns on investment, making health care and life sciences a riskier investment.

Infrastructure: Physical (incubation/lab space, research facilities)

While there are dozens of co-working spaces, incubation services, and start-up support for small businesses, there is not a substantial amount of lab space specifically for the health care and life sciences innovation ecosystem. Additionally, a large amount of Utah is rural and these assets are less common in rural areas.

Technology and Information Systems Innovation Ecosystem

POTENTIAL STRENGTHS

Human Capital: Pre-Graduation

Utah's educational institutions have thriving programs that equip students with education and experiences that encourage growth in the technology and information systems innovation ecosystem. These institutions offer several programs designed to prepare students for careers in tech. A few examples include: 1) the University of Utah's Kahlert School of Computing that provides a wide range of degrees from computer science, data science, software development, and computer engineering, 2) Brigham Young University's computer science programs that include many concentrations such as animation and games, bioinformatics, software engineering, and machine learning, 3) the StartUp Incubator and associated resources at Utah Tech University's Atwood Innovation Plaza, which offers programs and resources for tech innovation.

The education system in Utah demonstrates strong support for the continuous development of human resource skills post-graduation through a variety of professional education programs and partnerships with industry leaders. Utah's System of Higher Education created the Utah Engineering and Computer Science Initiative to encourage more students to graduate in STEM fields. Utah also has significant access to skills and education in tech outside higher education, such as through Davis Technical College, Ogden-Weber Technical College, and multiple coding bootcamps such as V School and Devmountain.

Infrastructure: Anchor Organizations

Utah is home to well-known global companies in the technology and information systems innovation ecosystem. Utah has produced 13 tech unicorns to date (a tech unicorn is a privately held startup company that has a valuation of at least $1 billion but is not listed on the stock market), including DOMO, Qualtrics, and Lucid Software. Utah is also home to regional offices for global giants such as Microsoft, Adobe, and Facebook.

***Financial** Capital: Venture/Other Capital Availability*

The Utah technology and information systems innovation ecosystem is a great place to acquire private funding. Whether sourcing funding from local VC firms such as Pelion or Epic Ventures, or accessing funding from out-of-state in San Francisco, San Jose, or others, Utah tech firms have had access to capital to innovate and grow–particularly over the past 10 years. The ecosystem experienced 135 VC deals in 2023 and 205 in 2022, with total capital invested of $707 million in 2023 and $2,260 million in 2022.

Surrounding Characteristics: Culture of innovation

Utah has a legacy culture in innovation, not only in the technology and information systems innovation ecosystem, but in other ecosystems that directly support this ecosystem, such as finance. This focus on innovation has led to Utah's strong economy, growth in tech companies, development of industry associations, and educational assets that all come together to advance the ecosystem in the state.

POTENTIAL GAPS

Infrastructure: Social (networks and collaboration among actors)

Utah has strong industry associations in the technology and information systems innovation ecosystem but the collaboration between the public and private sectors appears to be a gap compared to other ecosystems. Tech companies and leaders historically have not played a strong role in the public policy process in the state.

APPENDIX 1:

Innovation Ecosystems Research

Innovation ecosystems are dynamic sets of actors, activities, artifacts, institutions, and relationships that influence and are essential for the innovative performance of an individual actor or a population of actors. This includes not only direct relationships but also complementary and substitute relations, forming a complex and evolving environment for innovation. They offer resources for entrepreneurs and typically generate innovation districts and hubs and lead to economic growth and prosperity. Many historical innovation ecosystems involved government planning with an eye towards national competition and security. Today, governments play a role in many innovation ecosystems with the goal of achieving national or regional economic excellence.

For an innovation ecosystem to thrive, it requires the collective integration of factors in four key areas: human capital, financial capital, infrastructure, and culture and economic elements. Human capital refers to the development of a skilled workforce equipped for the demands of an innovative environment. Financial capital, from public, private, or non-profit funding sources, is crucial for supporting startups and funding collaborative projects among the government, academic institutions, and businesses. Physical infrastructure, including pilot facilities or testing labs, and social networks or entrepreneurial communities are vital for providing a conducive environment for innovation to flourish. Lastly, the culture and economic landscape surrounding the innovation ecosystem play significant roles in the success of innovation. A thriving economy and a high quality of life attract talented individuals to the ecosystem. A culture that fosters innovation encourages creativity, experimentation, and the exploration of new ideas, solutions, and ventures, thereby bolstering the innovation ecosystem.

Why Innovation Ecosystems Matter

Innovation ecosystems promote economic growth, foster collaboration, knowledge, and technology transfers. They also provide support for entrepreneurs and startups–which in turn supports further innovation. Innovation ecosystems also mitigate risk and enable adaptation to change, foster global competitiveness, and engender solutions for societal challenges, along with creating significant cultural and educational impact.

Economic Growth and Prosperity

Innovation ecosystems encompass the essential components, assets, and characteristics necessary to foster economic expansion and prosperity for residents. The innovation emerging from thriving ecosystems, along with the subsequent creation of innovation districts, enhances economic productivity and occasionally contributes to addressing societal and environmental challenges. Innovation districts generate high-quality, high-paying job opportunities for residents while spurring high rates of migration, both domestically and internationally. Those who migrate to these innovation districts tend to be highly educated, highly valuable citizens who only add to the economic advantages of the region. Innovation ecosystems "have the unique potential [...] to spur productive, inclusive, and sustainable economic development".[34]

As economic growth and prosperity increase and as more capital flows into local regions, state and local governments experience increased tax revenue that can be invested back into the community, local infrastructure, additional economic incentives, educational and training resources, and other needs. In summary, innovation ecosystems contribute to economic growth and well-being in the following ways:

- Providing local employment opportunities
- Supporting the attraction and retention of skilled talent, including executives
- Advancing targeted industry strategies
- Creating a targeted economic impact in innovation-rich regions
- Generating measurable competitive advantages for a region's economy
- Creating a shared common goal that leads to economies of scale and greater propensity for success, such as shared strategy and R&D that can leverage the combined strengths of ecosystem participants

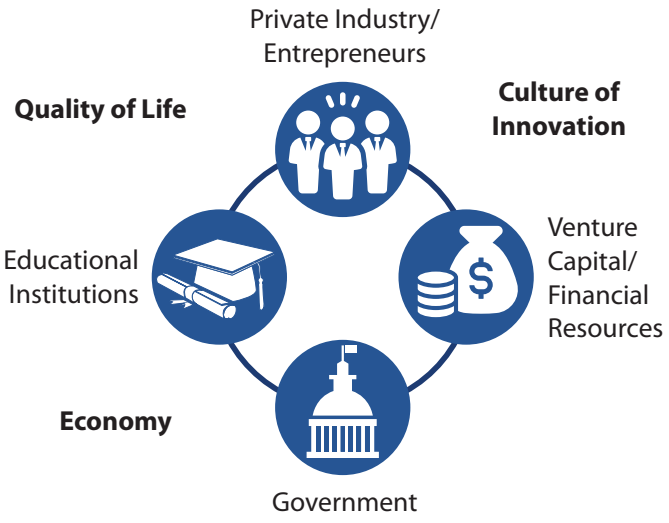
Resources for Entrepreneurs and Local Innovation

Successful innovation ecosystems foster the development of innovation districts and innovation hubs, which are often designed and developed to provide invaluable resources for entrepreneurs and innovators within a community. These resources frequently include incubation services to help entrepreneurs and small businesses secure funding from investors or government grants. Access to capital is critical to entrepreneurs and small businesses, often determining their success or failure.

Innovation districts and hubs provide access to programs that educate entrepreneurs on essential business and innovation skills. These may include navigating the legal requirements to run a business, managing personal and business finance, developing customer service skills, and implementing effective marketing strategies. They may also offer more advanced training programs and opportunities for experienced entrepreneurs and business owners.

Innovation ecosystems provide important infrastructure for catalyzing economic growth, including job creation activities. Entrepreneurs, startups, and small businesses find an environment where innovative and forward-thinking action is rewarded and leads to growth for their businesses and resulting growth for local economies. Some societal pressing issues can be solved when thought leaders from different industries convene and share ideas and resources.

Figure 1-1: Innovation Ecosystem Actors and Surrounding Characteristics



Global and State Competitiveness

Innovation ecosystems provide an avenue for increased economic competitiveness on both a global and national scale. The literature on innovation systems, originating with Frederich List in 1841, initially advocated for the establishment of innovation systems to enhance competitiveness and ensure national security amidst the early stages of globalization.[35] The increase in innovation, industry, and prosperity makes the region an attractive place to both live and do business. Effective ecosystems see an increase in national and international migration to the region, further boosting the economy, adding skilled labor, and driving further growth and prosperity for both citizenry and the private sector. Public entities see an increase in tax revenue because of the economic growth. These benefits have a compounding effect that continues to benefit a region's competitiveness nationally and internationally.

Innovation Ecosystem Characteristics and Drivers

An innovation ecosystem can be established across various scales of economic activity, ranging from individual projects or enterprises to regional, national, and global levels. A well-functioning innovation ecosystem integrates actors and activities to create an environment that facilitates new ideas, develops, and brings them to the market, which helps foster economic growth and development. Assessing an innovation ecosystem involves recognizing the current state of its key characteristics or drivers, examining the disparity between the present conditions and successful instances, and devising further plans or strategies based on these findings.

"Innovation characteristics" are defined here as generally present or desirable to have in an innovation ecosystem but not necessarily required for success. Innovation drivers represent the subset of characteristics that are required or act as significant catalysts to progress. An innovation ecosystem is not necessarily the result or outcome of innovation characteristics, nor are all innovation characteristics needed to build an effective ecosystem. The general framework outlined below provides a guide to evaluate the maturity and success of an innovation ecosystem.

Innovation ecosystem actors include private sector parties such as startups, small and medium-sized enterprises, and large anchor businesses where entrepreneurs innovate and investments in research and development (R&D) occur across a single or multiple industries. Public sector actors include federal, state, and local governments who play a supporting role in creating a strong economy and fostering a culture of innovation. Higher education and other learning organizations develop human capital and research necessary for economic development.

Characteristics of an innovation ecosystem are organized into four key areas: human capital development, financial capital, physical and social infrastructure, and the surrounding culture and economy. Characteristics or factors organized to each area are outlined below:

- ***Human Capital*** – Human capital characteristics describe the role of higher education and other learning institutions in human capital development, the skilled workforce, R&D activity, and commercialization.
- ***Financial Capital*** – Financial capital characteristics describe the state and local tax system, business incentive programs, private and public sources of capital, federal/state/local commercialization programs and funding matches, and other factors related to the availability and access of capital to spur innovation.

- ***Physical and Social Infrastructure*** – Characteristics of physical and social infrastructure include physical places for research and collaboration of ecosystem actors and placemaking, such as research facilities, incubation space/labs, hubs/districts, and anchor companies/organizations and their connectedness to entrepreneurs. Social capital and networks are part of social infrastructure as well.
- ***Surrounding Characteristics*** – Surrounding characteristics of innovation ecosystems include those assets that provide economic strength and opportunities. This includes a culture of innovation among ecosystem actors, the quality of life/livability and amenities to attract a talented workforce, and other wrap-around and supporting factors.

Innovation Ecosystem Assessment Framework: An Opportunity Analysis

A successful innovation ecosystem should be built on comprehensive regional master plans where all characteristics or elements could be assessed holistically to identify opportunities and challenges and ensure the high quality, compatibility, and relevance of each element.[36] Effective innovation ecosystems typically employ systems to measure and monitor the influence of innovations on the economy, society, and environment. This project focuses on a regional innovation framework as opposed to a national framework given Utah's regional economy. The proposed framework combines Viitanen's (2016) and Guzman et al. (2023) frameworks as the guide for the Part Two research.[37] Both studies share a common goal of pinpointing the factors contributing to a successful regional innovation ecosystem.

Viitanen's framework identified the key ecosystem characteristics essential for establishing a robust foundation in the regional innovation ecosystem. The framework has undergone testing and validation through a selected case study of Cambridge, United Kingdom. The interconnected elements in the innovation ecosystems are grouped by the activities driven by the different actors. Guzmen et al. (2023) examined significant public sector initiatives, studied the regional bottlenecks, and analyzed initiative outcomes.

Assessment on activities driven by the private sector - The strength of relationships among related companies enhances the introduction of innovative concepts and attracts a skilled workforce. High-growth small and medium enterprises (SMEs) and startups, sometimes backed by venture capital, can introduce fresh ideas and contribute to business creation. Simultaneously, dynamic anchor companies can leverage these new ideas to enhance product development, participate in global value network competition, and adopt a comprehensive approach to business development.

Assessment on activities driven by public sector - The public sector plays a large role in supporting and facilitating many parts of the innovation ecosystem. The activities in this group involve policies related to education, R&D, tax policy, and regulations that uphold intellectual property and other critical laws.

Table 1-1: Examples of assessment questions grouped by activities from Viitanen (2016) and Guzmen et al. (2023)

Group of Activities	Actors	Examples of Key Questions for Assessment
Activities driven by the private sector	Anchor Companies Startups & Growth-Oriented SMEs Venture companies	• How many domestic/global anchors are located within the ecosystem? • How active are these anchors in cross-sectoral collaboration? • How many startups and ventures are born within the ecosystem? • How growth-oriented have the local SMEs been since going public?
Activity driven by public sector	Education (elementary to university)	• How well does the education system meet the global criteria? • How well is the K-12 curriculum designed for critical thinking and research skills?
	Infrastructure/Service Structures	• Is there a good connectivity to other regions through airports? • Is there good internet access? • How well does the local infrastructure/service structure meet global criteria?
	Innovation Policy Framework	• Does the state support innovation through the tax system? • Are there matching funds from federal grants by local government? • How successful have these actors been attracting funding? • How well have the local actors managed to link in and benefit from the national policy framework?
Activities driven by public-private partnerships	Cluster Policies and Programs	• How many cross-sectoral cluster programs are established? • Are these programs connected to the outside (globally?)
	R&D Activity	• How many top-quality actors are located within the ecosystem? • How active are these actors in cross-sectoral collaboration?
	Incubation Environments Living Labs & Test Beds	• What kind of incubation services are available to tenants? • How well does the incubation system facilitate SME growth? • What kinds of test environments exist within the ecosystem? • Do the test environments involve end users in joint activities • Are the incentives set up so that the innovators seek to commercialize their inventions?

Source: Viitanen (2016) and Guzmen et al. (2023)

Figure 1-2: Opportunity Analysis Framework of Utah Innovation Ecosystems

Assessment on activities in public-private partnerships - Many studies emphasize the significance of public-private partnerships to the success of innovation ecosystems. The relationship between universities, responsible for generating skilled labor and innovative concepts through research, and industries, allows for ideas and research to be transformed into production and commercialization. These endeavors are based on mutual public-private interests, where collaborative activities supporting intellectual property and cross-sectoral collaboration are jointly planned.

The key questions for evaluation are grouped into four key areas (Figure 2). The degree to which each area has developed and matured likely varies across innovation ecosystems. During Part Two of the research project, each of the four areas will be evaluated for all of Utah's identified innovation ecosystems via quantitative analysis of available data and qualitative insights obtained by in-depth interviews of key leaders from each ecosystem.

Common Characteristics (Drivers of Success)

This examination of national and international innovation ecosystems has revealed commonalities that may correlate with success. For examples of specific case studies, see the following section. These commonalities include industry legacy and expertise, notable companies, robust research initiatives, and active research and development with strong university-industry connections. These success factors often cluster in major markets, known for their skilled workforce, strategic locations, and proximity to key assets like schools and research centers. A lively entrepreneurial culture, interdisciplinary collaboration, and consideration of geography, population, equity participation, and affordability also play a role in success. Additionally, access to funding through venture capital, support for startups, and favorable government policies, such as tax incentives and grants, contribute to the success of businesses and thus the ecosystem. These factors highlight the varied aspects contributing to innovation's success.

Innovation Ecosystems Around the World

Innovation ecosystems are present across the world in varying degrees of maturity. Many communities have components of innovation ecosystems but lack critical drivers of success. Others flourish and epitomize what an innovation ecosystem can become. Many of these ecosystems are instructive when evaluating local strengths and gaps.

United States Examples

Boston

Home to 26 unicorns (companies with a valuation over $1 billion) and world-class universities, Boston has long been a center of innovation and growth. Boston has industry expertise in life sciences, fintech, and AI. With an educated workforce, local business mentorship, and an excellent location, Boston has all the key ingredients for an innovation ecosystem. "Workforce is critical. In the most successful Innovation Districts, talent is the top priority."[38]

> *"Boston's ecosystem is a force to be reckoned with. Fueled by top-tier universities, experienced entrepreneurs, and a supportive community, it's no surprise it continues to produce innovative startups and attract significant funding."*
>
> - Harry Glorikian, General Partner, Scientia Ventures

Boston's local government is known for being supportive to startups and other innovation efforts. Boston's innovation ecosystem is on par with the best global ecosystems and ranks high due to its collaborative and focused efforts to innovate.

Detroit

Detroit is an example of an innovation ecosystem, particularly in the tech sector. Detroit is home to Google, Microsoft, Apple, Amazon, IBM, and Rocket Mortgage, and has regional offices for LinkedIn, Twitter, and Cisco, among others. Detroit has a strong startup environment with over 1,500 companies across different sectors. The city has expertise in tech, cybersecurity, and life sciences.

"Detroit entrepreneurs are resourceful, tenacious, and have shown it can be done—high growth, strong investment, big exits. As a high-caliber support ecosystem forms around our future founders, we're going to see high-growth companies lead Michigan's economy."

- Justin Mast, Founder, Bloomscape

Detroit invests in local talent, offers tax credits to incentivize growth, and takes advantage of its strategic location. Detroit also has the support of investors, with $13 billion in venture capital funding between 2018 and 2022.[39]

Philadelphia

Philadelphia has industry expertise in life sciences, advanced manufacturing and robotics, artificial intelligence (AI) and data analytics, and more recently, fintech. Philadelphia has attracted significant investment from outside the community, including nearly $5 billion from New York and more than $3 billion from San Francisco.

"We're building an innovation ecosystem that will help to propel our region to global leadership in Life Sciences, and we're laying the path for our researchers, co-op students, graduates and neighbors to participate."

- John Fry, President, Drexel University

Ben Franklin Technology Partners of Southeastern Pennsylvania (Ben Franklin) is a state fund that invested over $10 million into 42 local companies. Ben Franklin offers grants, loans, and equity to startups.[40] Philadelphia is home to eight unicorns and over $16 billion in total venture capital funding between 2018 and 2022.

Bakery Square, Pittsburgh
Source: Utah System of Higher Education, Global Innovation District Research

Pittsburgh

Pittsburgh was recently the recipient of a $62.7 billion federal grant from the Economic Development Administration to grow its robots and autonomy ecosystem. This funding has catalyzed the development of the Robotics Factory, an organization that helps robotics startups get off the ground.

"Pittsburgh is quite literally leading our nation back to the surface of the Moon, and if Pittsburgh can land on the Moon, Pittsburgh can do anything. We are the next generation of the tech economy, and the opportunities here are limitless."

- John Thornton, CEO, Astrobotic Technology, Inc.

Local educational institute Carnegie Mellon University, along with the Norman and Ruth Rales Foundation, support the development of the local STEM talent pipeline with tuition-free graduate study for nearly 90 students per year.

Pittsburgh has industry expertise in advanced manufacturing and robotics, life sciences, and "spacetech." Pittsburgh also has a fully developed innovation district, focusing on research and development of these industries.[41]

San Diego

San Diego has been a center for tech innovation for many years, which has continued to grow due to its many universities and military bases. The city is flooded with incubators, accelerators, and other resources available for startup success.

"San Diego's strength is its breadth of innovation: Tech, Life Sciences, Defense, and Healthtech are all colliding and collaborating. Nearshoring is easy with Mexico just 20 miles from downtown, and the great weather further contributes to the ecosystem being perfectly positioned for continued growth."

- Mike Krenn, CEO, Connect/SDVG

San Diego has expertise in "cleantech", life sciences, and AI/big data analytics. With over $23 billion in venture capital funding between 2018 and 2022, San Diego has no shortage of investors willing to support the development of innovative technologies.[42]

In addition to those listed above, the United States has many other established and emerging innovation ecosystems. Just a few are listed below:

- Atlanta, Georgia
- Baltimore, Maryland
- Boston, Massachusetts
- Brooklyn, New York
- Buffalo, New York
- Cambridge, Massachusetts
- Chicago, Illinois
- Cleveland, Ohio
- Houston, Texas
- Portland, Oregon
- Providence, Rhode Island
- San Francisco, California
- San Jose, California
- Seattle, Washington

International Examples

Paris, France

Station F in Paris is the world's largest startup campus and a successful innovation district. The campus is home to more than 1,000 startups and more than 30 programs designed to support the next generation of entrepreneurs.

- ***Support for Research and Innovation*** **-** France offers incentives such as exemptions and reimbursements to encourage research hiring, demonstrating a commitment to fostering innovation. Station F connects early-stage ventures with funds and investors, highlighting a broader ecosystem that supports innovation.
- ***Navigating Regulatory Processes*** **-** Trainers are available to assist individuals and companies in navigating complex regulatory processes, making it easier to engage in research and entrepreneurship.
- ***Diverse and Specialized Zones*** **-** Station F operates diverse zones, including Share Zone and Create Zone, each with its own focus and managed by different entities. The presence of various programs within Station F demonstrates specialization in areas like fashion, finance, crypto, and work.
- ***Equity Participation and Affordability*** **-** Startups participating in Station F programs typically give up a percentage of equity in exchange for benefits like mentorship, affordable desk space, and access to resources. Station F's emphasis on affordability, with low monthly fees and special rates on services, makes it accessible to a wide range of startups.
- ***Community and Networking*** **-** Station F promotes community and networking among startups, investors, and venture capitalists, with events like Future 40 and demo days. The presence of housing options like Flatmates, which attract international students, further fosters a diverse and interconnected entrepreneurial environment.

Cambridge, England

Cambridge University is home not only to world-class educational assets, but also collaborations with government and the private sector. These collaborations foster an environment for innovation and new businesses.

- ***Interdisciplinary Collaboration*** **-** Cambridge thrives on a rich and vibrant collaborative ecosystem that involves academia, businesses, and government organizations. The clustering of excellence is based on specialized technical expertise, facilitating the cross-pollination of ideas.

- ***Strong University-Industry Connections*** **-** Cambridge has a strong affiliation with its university, and there are dedicated personnel available to connect companies with the university's activities. This connection supports tech commercialization and fosters innovation.
- ***Investment and Support for Startups*** **-** Organizations like Cambridge Innovation Capital are instrumental in supporting startups, focusing on deep tech, med tech, and biotech investments. They collaborate with other entities to provide investment opportunities and have a positive impact on the local entrepreneurial ecosystem.
- ***Talent Development and Entrepreneurship*** **-** The region emphasizes talent development, transparency, and professional autonomy. Special attention is given to post-docs, who are trained to become entrepreneurs, recognizing that only a few will continue in academia.
- ***Data-Driven Advocacy*** **-** Membership organizations like Cambridge Ahead play a significant role in advocating for good growth and improving the quality of life in the area. They operate as conveners and bring valuable data to inform decision-making processes.

Dubai, United Arab Emirates

A center for regional and international trade for over one-hundred years, Dubai has seen impressive growth and made strides in innovation. With focus on research, financing innovation, and accelerators among others, Dubai offers a welcoming environment for growing startups.

- ***Dubai Future Foundation*** **–** The foundation acts as a driver of economic development through heavy investment in research. Strong partnerships exist in Dubai for workforce development. The pictured museum highlights Dubai's many innovation success stories.
- ***Abu Dhabi Global Market*** **–** Abu Dhabi is positioned as an international finance center. Abu Dhabi focuses on driving innovative solutions to problems through partnerships with research, access to capital, and policy advocacy.
- ***Hub71 (Incubator/Accelerator/Fund)*** **-** The government makes large investments to support translational research and early startups. Hub71 segments by sector and includes state agencies as partners to allow the opportunity of entrepreneurs to solve real problems.

Dubai, United Arab Emirates
Source: Utah System of Higher Education, Global Innovation District Research

Other international examples of innovation ecosystems include:

- Barcelona, Spain
- Berlin, Germany
- London, England
- Medellin, Columbia
- Montreal, Canada
- Seoul, South Korea
- Stockholm, Sweden
- Toronto, Canada

APPENDIX 2:

Research Methodology

Opportunity Analysis

While the primary unit of analysis for this research was the innovation ecosystem, potential innovation hubs and innovation districts were also identified, often aligned to specific innovation ecosystems. Additional research would be required to solidify identification of innovation hubs and districts in Utah, as well as their strengths and gaps.

To identify Utah innovation ecosystems, the research team followed four steps: 1) defining an innovation ecosystem, 2) understanding and organizing characteristics of an ecosystem into a framework, 3) applying the definition and framework to Utah, and 4) validating Utah's identified innovation ecosystems with the project's advisory council. The advisory council consisted of Kori Ann Edwards and Pete Codella (Governors' Office of Economic Opportunity), Jefferson Moss and Tori Hooper (Utah System of Higher Education), David Carlebach and Peter Given (World Trade Center Utah), Brad Bonham (BONCO), Don Willie (Love Utah Box, Willie Strategies, The Point Utah), Jennifer Robinson (Kem C. Gardner Policy Institute), and Scott Cuthbertson (EDCUtah). The opportunity analysis that followed revealed varying levels of maturity across the many characteristics defining Utah's innovation ecosystems. While this report focused on more mature innovation ecosystems such as Utah's broad multi-disciplinary innovation ecosystem and five industry-aligned innovation ecosystems, there are certainly other less mature innovation ecosystems in Utah beyond the scope of this report.

The opportunity analysis consisted of both data analysis and in-depth interviews. The research team evaluated publicly available data sources as noted and cited throughout the report. The data analysis organized information of each innovation ecosystem by 12 primary characteristics, which each fall under one of four major areas: human capital, financial capital, infrastructure, and surrounding characteristics. Detailed summaries of the data analysis are provided in Appendix 4. Twelve industry experts and entrepreneurs shared insights as interviewees in the in-depth interviews, each with unique roles, backgrounds, and perspectives. The interviewees included entrepreneurs considered pioneers or leaders in each of Utah's five-industry aligned innovation ecosystems, leaders in higher education, leaders in state government, and managing partners of venture capital firms. The mixed methods approach to this research surfaced potential strengths and gaps in each of the identified innovation ecosystems in Utah.

Industry Alignment

The table below maps specific industries and their associated NAICS to the five industry-aligned innovation ecosystems. These mappings were used to calculate economic statistics in Section 2 and Appendix 4 of this report. Industries mapped to aeronautics/space exploration/defense, energy production, financial/fintech/headquarters, health care/life sciences, and technology/information systems represent GOEO's industry clusters for aerospace and defense, energy, financial services, life sciences, and information technology, respectively. While this research report does not focus on economic industries, their alignment to innovation ecosystems represents one of many evaluated innovation ecosystem characteristics.

Table 2-1: Industry Mapping with Utah's Innovation Ecosystems

NAICS	Industry	Innovation Ecosystem
325211	Plastics Material and Resin Manufacturing	Aeronautics/Space Exploration/Defense
325920	Explosives Manufacturing	Aeronautics/Space Exploration/Defense
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	Aeronautics/Space Exploration/Defense
335991	Carbon and Graphite Product Manufacturing	Aeronautics/Space Exploration/Defense
336411	Aircraft Manufacturing	Aeronautics/Space Exploration/Defense
336412	Aircraft Engine and Engine Parts Manufacturing	Aeronautics/Space Exploration/Defense
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	Aeronautics/Space Exploration/Defense
336414	Guided Missile and Space Vehicle Manufacturing	Aeronautics/Space Exploration/Defense
336415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	Aeronautics/Space Exploration/Defense
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing	Aeronautics/Space Exploration/Defense
336992	Military Armored Vehicle, Tank, and Tank Component Manufacturing	Aeronautics/Space Exploration/Defense
488190	Other Support Activities for Air Transportation	Aeronautics/Space Exploration/Defense
541330	Engineering Services (25%)	Aeronautics/Space Exploration/Defense
927110	Space Research and Technology	Aeronautics/Space Exploration/Defense
928110	National Security	Aeronautics/Space Exploration/Defense

Table 2-1: Industry Mapping with Utah's Innovation Ecosystems *(continued)*

NAICS	Industry	Innovation Ecosystem
21	Mining, Quarrying, and Oil and Gas Extraction (76%)	Energy Production
22	Utilities (75%)	Energy Production
23	Construction (25%)	Energy Production
31	Manufacturing (6%)	Energy Production
486	Pipeline Transportation	Energy Production
521110	Monetary Authorities-Central Bank	Financial/Fintech/Headquarters
522110	Commercial Banking	Financial/Fintech/Headquarters
522130	Credit Unions	Financial/Fintech/Headquarters
522180	Savings Institutions and Other Depository Credit Intermediation	Financial/Fintech/Headquarters
522210	Credit Card Issuing	Financial/Fintech/Headquarters
522220	Sales Financing	Financial/Fintech/Headquarters
522291	Consumer Lending	Financial/Fintech/Headquarters
522292	Real Estate Credit	Financial/Fintech/Headquarters
522299	International, Secondary Market, and All Other Nondepository Credit Intermediation	Financial/Fintech/Headquarters
522310	Mortgage and Nonmortgage Loan Brokers	Financial/Fintech/Headquarters
522320	Financial Transactions Processing, Reserve, and Clearinghouse Activities	Financial/Fintech/Headquarters
522390	Other Activities Related to Credit Intermediation	Financial/Fintech/Headquarters
523150	Investment Banking and Securities Intermediation	Financial/Fintech/Headquarters
523160	Commodity Contracts Intermediation	Financial/Fintech/Headquarters
523210	Securities and Commodity Exchanges	Financial/Fintech/Headquarters
523910	Miscellaneous Intermediation	Financial/Fintech/Headquarters
523940	Portfolio Management and Investment Advice	Financial/Fintech/Headquarters
523991	Trust, Fiduciary, and Custody Activities	Financial/Fintech/Headquarters
523999	Miscellaneous Financial Investment Activities	Financial/Fintech/Headquarters
524113	Direct Life Insurance Carriers	Financial/Fintech/Headquarters
524114	Direct Health and Medical Insurance Carriers	Financial/Fintech/Headquarters
524126	Direct Property and Casualty Insurance Carriers	Financial/Fintech/Headquarters
524127	Direct Title Insurance Carriers	Financial/Fintech/Headquarters
524128	Other Direct Insurance (except Life, Health, and Medical) Carriers	Financial/Fintech/Headquarters
524130	Reinsurance Carriers	Financial/Fintech/Headquarters
524210	Insurance Agencies and Brokerages	Financial/Fintech/Headquarters
524291	Claims Adjusting	Financial/Fintech/Headquarters
524292	Pharmacy Benefit Management and Other Third Party Administration of Insurance and Pension Funds	Financial/Fintech/Headquarters
524298	All Other Insurance Related Activities	Financial/Fintech/Headquarters
525110	Pension Funds	Financial/Fintech/Headquarters
525120	Health and Welfare Funds	Financial/Fintech/Headquarters
525190	Other Insurance Funds	Financial/Fintech/Headquarters
525910	Open-End Investment Funds	Financial/Fintech/Headquarters
525920	Trusts, Estates, and Agency Accounts	Financial/Fintech/Headquarters
525990	Other Financial Vehicles	Financial/Fintech/Headquarters
541211	Offices of Certified Public Accountants	Financial/Fintech/Headquarters
541213	Tax Preparation Services	Financial/Fintech/Headquarters
541214	Payroll Services	Financial/Fintech/Headquarters
541219	Other Accounting Services	Financial/Fintech/Headquarters
325411	Medicinal and Botanical Manufacturing	Health Care/Life Sciences
325412	Pharmaceutical Preparation Manufacturing	Health Care/Life Sciences
325413	In-Vitro Diagnostic Substance Manufacturing	Health Care/Life Sciences
325414	Biological Product (except Diagnostic) Manufacturing	Health Care/Life Sciences
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing	Health Care/Life Sciences
334516	Analytical Laboratory Instrument Manufacturing	Health Care/Life Sciences
334517	Irradiation Apparatus Manufacturing	Health Care/Life Sciences
339112	Surgical and Medical Instrument Manufacturing	Health Care/Life Sciences
339113	Surgical Appliance and Supplies Manufacturing	Health Care/Life Sciences

Table 2-1: Industry Mapping with Utah's Innovation Ecosystems *(continued)*

NAICS	Industry	Innovation Ecosystem
339114	Dental Equipment and Supplies Manufacturing	Health Care/Life Sciences
339115	Ophthalmic Goods Manufacturing	Health Care/Life Sciences
339116	Dental Laboratories	Health Care/Life Sciences
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	Health Care/Life Sciences
423460	Ophthalmic Goods Merchant Wholesalers	Health Care/Life Sciences
424210	Drugs and Druggists' Sundries Merchant Wholesalers	Health Care/Life Sciences
541380	Testing Laboratories and Services	Health Care/Life Sciences
541713	Research and Development in Nanotechnology	Health Care/Life Sciences
541714	Research and Development in Biotechnology (except Nanobiotechnology)	Health Care/Life Sciences
541715	Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	Health Care/Life Sciences
541720	Research and Development in the Social Sciences and Humanities	Health Care/Life Sciences
621511	Medical Laboratories	Health Care/Life Sciences
334111	Electronic Computer Manufacturing	Technology/Information Systems
334112	Computer Storage Device Manufacturing	Technology/Information Systems
334118	Computer Terminal and Other Computer Peripheral Equipment Manufacturing	Technology/Information Systems
334210	Telephone Apparatus Manufacturing	Technology/Information Systems
334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	Technology/Information Systems
334290	Other Communications Equipment Manufacturing	Technology/Information Systems
334310	Audio and Video Equipment Manufacturing	Technology/Information Systems
334412	Bare Printed Circuit Board Manufacturing	Technology/Information Systems
334413	Semiconductor and Related Device Manufacturing	Technology/Information Systems
334416	Capacitor, Resistor, Coil, Transformer, and Other Inductor Manufacturing	Technology/Information Systems
334417	Electronic Connector Manufacturing	Technology/Information Systems
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing	Technology/Information Systems
334419	Other Electronic Component Manufacturing	Technology/Information Systems
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing	Technology/Information Systems
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	Technology/Information Systems
334512	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	Technology/Information Systems
334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables	Technology/Information Systems
334514	Totalizing Fluid Meter and Counting Device Manufacturing	Technology/Information Systems
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	Technology/Information Systems
334516	Analytical Laboratory Instrument Manufacturing	Technology/Information Systems
334517	Irradiation Apparatus Manufacturing	Technology/Information Systems
334519	Other Measuring and Controlling Device Manufacturing	Technology/Information Systems
334610	Manufacturing and Reproducing Magnetic and Optical Media	Technology/Information Systems
423430	Computer and Computer Peripheral Equipment and Software Merchant Wholesalers	Technology/Information Systems
513210	Software Publishers	Technology/Information Systems
517111	Wired Telecommunications Carriers	Technology/Information Systems
517112	Wireless Telecommunications Carriers (except Satellite)	Technology/Information Systems
517121	Telecommunications Resellers	Technology/Information Systems
517410	Satellite Telecommunications	Technology/Information Systems
517810	All Other Telecommunications	Technology/Information Systems
518210	Computing Infrastructure Providers, Data Processing, Web Hosting, and Related Services	Technology/Information Systems
519290	Web Search Portals and All Other Information Services	Technology/Information Systems
541511	Custom Computer Programming Services	Technology/Information Systems
541512	Computer Systems Design Services	Technology/Information Systems
541513	Computer Facilities Management Services	Technology/Information Systems
541519	Other Computer Related Services	Technology/Information Systems
541910	Marketing Research and Public Opinion Polling	Technology/Information Systems

Note: Percentages following industry names represent assumptions for partial industries used since not all companies in those respective NAICS belong to GOEO's industry clusters. Percentages for energy-production related industries are determined by the U.S. Department of Energy.

APPENDIX 3:

In-depth Interviews Summary

Twelve industry experts and entrepreneurs shared insights as interviewees to identify strengths and weaknesses in Utah's innovation ecosystems. Interviewees included the following: entrepreneurs considered pioneers or leaders in each of the five industry-specific innovation ecosystems, leaders in higher education, leaders in state government, and venture capitalists. Summary insights are described below. Views expressed by interviewees do not necessarily represent views of the research team or the comprehensive understanding gleaned from the entire research project.

STATE GOVERNMENT

Social (networks and collaboration among actors)

Governor Mike Leavitt recruited a lot of venture capitalists to Utah, developed the sandbox program, and helped make it easier to do business in the state. We've seen other great efforts by governors and state and local leaders, but overall there is not enough collaboration between the state government, academia, industry, and other stakeholders to drive innovation in Utah. For example, state government can help build physical spaces and be a one-stop-shop for innovation, bringing together higher education, the private sector, and government resources. This can particularly be useful in more rural communities across the state that may lack resources. Higher education can also do more to support students looking to commercialize business ideas.

The state has restructured committees to better align technology with economic development and workforce, emphasizing collaboration. The goal is to create environments where entrepreneurs, professors, and students can effectively engage.

It's important to avoid redundancy in state-supported innovation efforts. Clear roles and collaboration among different entities are crucial to ensure efficient use of resources. The goal is to foster a holistic approach to innovation, where state and educational institutions work together seamlessly to support economic development.

Local/State/Federal Government Funding and Commercialization Programs

While there aren't a lot of significant funding opportunities for small businesses, Utah's tax credits are great for bringing in larger, notable corporations which help fuel the innovation ecosystems. These funding opportunities tend not to apply to smaller companies, and many companies are not even aware of the opportunities. It is particularly difficult to acquire funding for manufacturing ventures of any kind.

Expansion of the sandbox would be beneficial for Utah. Deregulate where it is safe, as innovation will die early if there are too many hurdles for a business to overcome. Utah needs to work to solve the funding challenge. The Utah Innovation Fund offers a public option that helps scalable ventures, but Utah needs additional options for "mom and pop" shops, which represent most small businesses.

The state supports commercialization through the Utah Innovation Fund and various programs, providing back-office support and funding to help translate research into commercial applications. The emphasis is on early-stage support, including market analysis and investment to get startups off the ground. This approach is aimed at maximizing the potential of research from all state universities, ensuring they benefit from shared resources and expertise. One example is the Manufacturing Modernization Grant Program (MMGP) which incentivizes Utah businesses to modernize, establish, relocate, retain, or develop manufacturing in the state. In many cases the state can take equity as part of the exchange for their support, creating a return for state if the company is successful.

When considering the role government should play in supporting the innovation ecosystems in Utah, a key is to help with deregulation. Many other states strangle companies with regulations, but Utah tends to handle this pretty well. Government can also run a more lean system–tax dollars are often spent on projects that should be funded and managed by the private sector, not taxpayer dollars.

HIGHER EDUCATION

Social (networks and collaboration among actors)

Utah has a number of private sector philanthropists and private sector organizations who have partnered with higher education to help students learn business skills and get companies off the ground. Often donors help ensure these partnerships are successful and lasting. Business professionals come together to share best practices and help universities and colleges prepare students to be part of the workforce. One local higher education expert indicated: "We (educators) should think of ourselves as an engine to grow the economy and have a broader impact than we had traditionally.

Utah universities that focus on this sort of collaboration tend to have a lot of spin offs and / or tech transfer success. This level of success rarely comes from a passive approach to industry integration and normally requires school administrators and the private sector to work together in an active way.

These collaborations are still in their infancy. While Utah has experienced some success in these partnerships, much remains to be done before education and industry can be said to be partnering effectively. It also tends to favor certain fields, such as business and tech, while being absent in other fields and disciplines.

Role of Education

While higher education institutions may typically be seen as a way to educate, the role of higher education is often also looked at as a way to prepare students to enter the workforce and earn an income. Universities in Utah could play a larger role in advancing Utah's innovation ecosystems by taking a more proactive approach to industry participation. A few ways this could be achieved include the following: being involved with Utah's chambers of commerce, EDCUtah, the Governor's Office of Economic Opportunity, industry associations such as Silicon Slopes and 47G, and by inviting venture capitalists to campuses to show them what universities are working on.

Universities should also focus on getting students through universities faster and at a better price while offering more applied experience to prepare them for industry. The current teaching methods often lag behind the realities of the workplace. For example, students are required to memorize information they can Google on their phone instead of learning practical skills—including soft skills--they will need when they enter the workforce.

Collaboration between higher education and industry is improving, with efforts to bring schools together to share best practices and resources. Industry advisory boards and targeted clusters help identify market opportunities early in the research process, ensuring that potential innovations are recognized and developed.

Higher education institutions provide significant resources, and state initiatives like the AI policy lab and sandbox environments support innovation. These efforts include working groups and standing subcommittees focused on areas such as AI and blockchain to ensure continuous development and policymaking.

Non-accredited educational organizations, such as coding boot camps, play a significant role in addressing the talent gap. These programs offer flexible, affordable training options that quickly fill industry needs. They are particularly valuable in rural and underserved areas, where traditional higher education may not be as accessible. However, students need to learn soft skills which can sometimes be lacking in fully online programs.

ENTREPRENEURSHIP

General Entrepreneurship

Venture/Other Capital Availability

Building a successful business requires people, space, and dollars. Utah has not always been good at these, but today Utah is doing really well with all three in most cases.

In the 1990s, it was not easy to acquire capital funding to start a business–businesses generally had to fly to California to speak with venture capitalists. Today in Utah, acquiring money is not generally an issue if you are in an industry venture capitalists consider low risk and high return, such as technology. Utah has also reached a critical mass with many serial entrepreneurs who have enough money to start new companies. Companies may face a challenge raising capital if they are not outlining a plan to disrupt a multibillion market or if it is a capital-intensive business.

Skilled Workforce

Generally, Utah has a very talented and educated workforce, and the state has reached a size where it's not generally difficult to find talent for most occupations. If you need specialized skills, you may need to recruit from out of state, but talent attraction is not overly difficult for Utah due to the high quality of life, outdoor activities, and arts and entertainment scene. However, Utah's housing prices are making it more difficult for people to afford to live in the state. Utah's low unemployment rate is a great sign of a strong economy, but it stifles job growth and can make it difficult to find qualified talent.

Culture of Innovation

Utah's culture of innovation is better than other places. In Utah, if someone can help you with their business, they will, and this is not the case everywhere. There is a very supportive network of business founders in Utah who are eager to help each other. This is one of the most critical needs for any entrepreneur–to build a strong network of people who have already done what you are trying to do. This can often be supplied by innovation hubs and incubation services. One local venture capitalist said: "[It] is super important that the universities, the capital providers, and the entrepreneurial community collaborate … [and] it happens all the time."

Aeronautics, Space Exploration, and Defense Innovation Ecosystem

Local/State/Federal Government Funding and Commercialization Programs

This ecosystem is dominated by federal spending. The aerospace and defense industry can be viewed as two buckets 1) aerospace is a more commercial bucket, such as airplanes, and 2) new sectors like advanced air mobility. The defense bucket significantly outspends the aerospace/commercial side, especially in Utah.

Venture/Other Capital Availability

Capital in aeronautics, space exploration, and defense first came from government programs. Entrepreneurs started entering the industry later, but there is still a real lack of capital for aerospace engineering and manufacturing. Venture capital in Utah is mostly focused on software deals rather than manufacturing. The design and manufacturing process is time consuming which makes it a riskier venture for investors. The Colorado Office of Economic Development provides funding for the aerospace and manufacturing industry similar to Utah Science Technology and Research Initiative (USTAR), which is no longer in existence. Colorado is able to recruit companies and uses COED as a draw to the state. Ohio also recruits new aerospace tech and manufacturing into the state through their manufacturing infrastructure, tax credits, and early-stage funding. These are areas Utah could improve upon. The state could step in and have some kind of a matching fund or build design, something where it could team up with private lenders, provide loan guarantees, etc., that are targeted to manufacturing in particular.

Culture of Innovation

Innovation in aeronautics, space exploration, and defense is hard to find in Utah. The ecosystem began with Hill Airforce Base, the first big contract being the ICBM contract. Hercules and Thiokol came out as key contributors to the ICBM program and put Utah on the aerospace industry map. Hercules and Thiokol needed to be in remote locations, and Utah was a great fit for them. They helped start the Minuteman missile program, submarine missile launch programs, and space shuttle motors.

Physical (Incubation/lab space, research facilities, innovation hubs and districts)

Utah state government can help the aeronautics, space exploration, and defense innovation ecosystem with Utah Technology Innovation Funding (UTIF), now being run through the Governor's Office of Economic Opportunity. The state should also provide incubator space for aerospace and manufacturing companies, which is largely missing in Utah. OxEon Energy, for example, is a success story that came out of USTAR. It started at the University of Utah and dealt in high-temperature ceramics. They also made fuel cells that convert natural gas into electricity. They received almost $40 million in grants to work on converting carbon dioxide into oxygen aka carbon sequestration efforts. UAMMI helped with the grant writing.

Social (networks and collaboration among actors)

State government can also collaborate better with academia and industry. Research professors often struggle with business acumen and commercialization. The former USTAR program tried recruiting researchers to the state with medical devices, but many innovations remain academic and have never been fully developed through commercialization. UTIF is now operating in that space, but academia, in general, struggles with commercialization. There are some Utah success stories, mostly in medical devices.

Anchor Organizations

EDCUtah and GOEO are doing proactive broad recruiting, but there may be an opportunity to do targeted recruiting with some really interesting accelerator fits. For example, targeted recruiting helped recruit Petzl to Utah. UAMMI worked on this by helping make and build connections that would help develop economic growth by operating as a connective tissue between groups. National labs see these different efforts and observe the strong connections that exist between business and universities and are being drawn to Utah.

Energy Production Innovation Ecosystem

Social (networks and collaboration among actors)

Utah is in need of higher quantity and quality of graduates to drive the energy production innovation ecosystem in the state. Mechanical engineering is great at the University of Utah, agricultural science/engineering is great at Utah State University, and business education is great at BYU, but deep tech engineering, etc., is all recruited from the east coast. Utah's energy social network is critical to advancing the ecosystem; one local energy expert and CEO indicated it was his mentors and social network that made it possible for him to launch his first product.

Quality of Life

Recruiting to Utah used to be easier and you could get an easy "yes" with a single weekend trip. Now, people fall in love with the state but are not able to afford the housing. Entry-level jobs on the east coast pay $250k, but even that does not get them the housing they would like to have here in Utah.

Culture of Innovation

In some ways Utah is a founder of coal. Utah has held onto nonrenewable energy sources for a long time and innovation is coming late. In the past four years, Utah has been trying to be more progressive with regard to energy production. Examples include virtual power plants, soleil lofts, and Rocky Mountain Power building a test power plant to show what distributive energy could look like without nonrenewable fuels. But Utah still lacks some major names in energy to anchor the ecosystem.

While deregulation can be the right approach in many ecosystems, the deregulation and the decreasing oversight that comes with the recent Chevron decision by the Supreme Court may not be good for energy production. National grid standards are important for innovation: they protect workers and protect the infrastructure. They function like a parent in the room establishing important standards. Now it is up to the states to control the standard of electricity. The grid connects state to state and we have to have cooperation between states and grid systems. One local energy expert said: "There is no question that Utah is by far the best set up to be the tech energy hub for us to set up the national standards for it. Economically we are set up perfectly to do it, leadership wise we are set up perfectly to do it."

Venture/Other Capital Availability

Utah is well-positioned to be a tech energy hub and to create the national standard for it. The state has great leadership and a great economy for it. Venture capital has long processes and while Utah has had IPOs and a lot of cash flow, the state is still missing A- and B-round funding. There are a lot of funding gaps between A and B investors in Utah. To own a market share requires investments of upwards of $800 million, which would have a significant economic impact on the state.

Local/State/Federal Government Funding and Commercialization Programs

Utah could use more U.S. Department of Energy (DOE) grants that would help fund research and bring in private companies to contract with public-use facilities (e.g., SRERC). One recent federal funding opportunity came by way of U.S. Representative John Curtis, who helped bring in $3 million for desalination and hydrogen research in CDSRP or earmarks. Grants are often going to help companies who don't need them; Utah needs new entrepreneurs supporting additional funding opportunities.

SRERC is also working with Jefferson Moss, who works for USHE and UTIF. UTIF is a hopeful source of funding that would help with research and commercialization. An example could be UTIF's investment in Eden Tech, developed at SUU. They focus on desalination research, and they might pilot their project at SRERC.

Finance, Fintech, and Headquarters Innovation Ecosystem

History/Factors of Success – Utah is a leader in the fintech industry, more so than many other industries. Governor Leavitt committed to spending time in Silicon Valley and recruiting companies and talent to Utah. Governor Huntsman followed this course and they were both largely successful. Having a platform compatible for both financial institutions and fintechs in the mid-2010s accelerated the growth of the fintech industry in Utah and beyond. The Fintech Data Exchange (FDX) gave standards to the industry, and it was established right here in Utah (with its founding meeting in Park City). The Dodd-Frank Act Section 1033 confirmed consumer ownership and access to their own financial data, giving regulatory clarity to allow the fintech industry to continue growing and evolving. Also, industrial banks in Utah contribute to fintech's success as both an early client for some Utah fintech firms as well as a fintech company themselves, in many cases.

Anchor Organizations

Success in this ecosystem breeds further successes. This ecosystem overlaps with technology. If one were to look at every tech company, fintech included, in Utah today, you would find "DNA in all those companies that's associated with companies like WordPerfect, Novell, Megahertz, and Iomega. Those were the initial early success tech stories in the state of Utah within what we would call the hardware and software technical space."

Culture of Innovation

Generally, the environment in Utah is very positive for innovation. There tends to be more entrepreneurs and innovators here than what's average or typical in other large cities or communities. These individuals want to solve problems and create innovative solutions.

Venture/Other Capital Availability

Historically, until a few years after the Great Recession of 2008-2009, entrepreneurs faced difficult challenges accessing capital in Utah. For the last decade or so, capital from both coasts has been "pouring" into the state's broad innovation ecosystem and fintech has played a "major role" in this growth of capital.

Economics and Demographics

Utah is "pretty small" and the Wasatch Front is getting crowded. It used to be easier to recruit talent from outside the state due to a lower cost of living here than in other places. Now, Utah property values are greater than many competitive areas. Transportation and other areas face challenges in Utah due to our growth over the years.

Infrastructure (Physical)

The Stena Center for Financial Technology at the University of Utah gives students industry lab-based learning and development, along with an associated incubator for innovation in financial technology. The purpose of this center is to create the next generation of innovators. Silicon Slopes acts more of a generalist for technology broadly and doesn't focus on fintech.

Infrastructure (Social)

The Governor's fintech council has helped government decision makers recognize the importance of the fintech industry in Utah.

Role of Regulation

This is a highly regulated industry. Financial services institutions work with multiple regulators, sometimes both at a federal and state level. Safety and soundness goals of regulators help the industry and innovators are wise to understand regulation and work with regulators.

Health Care and Life Sciences Innovation Ecosystem

Anchor Organizations

While Utah's health care and life sciences innovation ecosystem has grown a lot over the past two decades, the industry is still a "lightweight" compared to health care and life sciences ecosystems in other legacy markets. Finding early talent for life sciences, tech, etc., is very easy in Utah, but more experienced and specialized experts are difficult and must be recruited. This has become easier post-pandemic, where many people have considered working from home and moving to a place with a high quality of life, such as Utah. But it can still be difficult for these experts to come to Utah because if things don't work out at the company they are hired at, there may not be many other options for them in the state. However, there tend to be few issues with retention and people seem to like it in Utah once they come.

Economy

Utah has lost life sciences companies as a result of difficulty recruiting enough qualified talent. Unless Utah universities expand their programs, or additional universities are established, this will likely continue to be an issue for the health care and life sciences innovation ecosystem. This ecosystem requires very specialized education and talent that is often filled by recruits from the east coast, San Francisco, or even London, England.

Physical (Incubation/lab space, research facilities, innovation hubs and districts)

There is minimal lab space in Utah for health care and life sciences companies to get off the ground. There is plenty of office space, but most life sciences companies need to build their own lab space, which can be very expensive. Altitude Lab is one of the few places in Utah where lab space can be leased.

Venture/Other Capital Availability

Venture capital is difficult to acquire in health care and life sciences–this is an issue in Utah and outside of Utah due to the high capital requirements and the length of time it can take to see a return on investment. It is a little easier to get this money from out-of-state, which is an option. Even some international investors are seeing the sciences as a good investment, creating a clear signal for supply in Utah for good companies looking for capital.

Social (networks and collaboration among actors)

BioHive and other industry associations are doing good work, but more needs to be done to close the gaps in the ecosystem. Universities launched the life sciences ecosystem in Utah, and other organizations, like The Church of Jesus Christ of Latter-day Saints, ancestry.com, and the Utah population database, have played a significant role in advancing the ecosystem, particularly from a diagnostics or medical and family records perspective. A sophisticated tech transfer ecosystem in Utah and a deep improvement to license or spin-off IP from universities could dramatically improve the ecosystem.

Utah governments have been supportive of life science companies with small funding opportunities, but it is probably not enough to make a significant difference. Payroll and property tax incentives are useful, but because these startups do not typically generate positive net income until they are sold, incentives based on income are less helpful.

Technology and Information Systems Innovation Ecosystem

Social (networks and collaboration among actors)

A key element driving success in Utah's business landscape is the robust network ecosystem that includes influential associations, strong community support, accessible venture capital, government initiatives, and a skilled talent pool. However, despite these advantages, several challenges persist. Securing capital remains a hurdle for some companies, particularly for non-enterprise software ventures, which often struggle to find the necessary funding to scale.

Venture/Other Capital Availability

There is a notable shortage of early-stage capital, which poses a barrier for startups seeking to secure funding for larger rounds of investment. Positive impacts on the ecosystem have been observed through collaborations such as the Sandbox program and tech transfers from research institutions, which have helped to foster innovation and support business growth. Women have also not sought funding from venture capitalists to the degree men have, creating a disproportionate amount of men awarded funding over women.

Anchor Organizations

Historically, Utah's tech ecosystem has evolved from the success of pioneering companies like Novell and Iomega, benefiting from supportive government policies, educational institutions, and a growing venture capital scene. Looking ahead, there are concerns about the transition to a new generation of entrepreneurs and the need to ensure continued community engagement to maintain the innovative culture that has been a hallmark of Utah's tech success. The challenge will be to sustain this momentum while addressing the ongoing issues related to funding and talent retention.

Utah's tech scene is thriving with a rich history in software and cybersecurity, tracing back to pioneers like Novell and influential figures from local institutions such as the University of Utah. Today, Utah boasts a diverse range of tech startups, including fintech companies like Divvy and MX, and infrastructure software firms.

Recent studies highlight Utah as a leading location for building unicorns, with 61 companies in the state reaching a billion-dollar valuation. The area's robust ecosystem includes investments in disruptive technologies, large markets, and visionary entrepreneurs.

VENTURE CAPITAL

Venture Capital Approach

Historically, venture capitalists' approach has been to remain generalists in investments due to the ever-evolving nature of the market. In the past, there were specialized funds focusing on specific areas such as BTC, BB, machine-to-machine communication, and Java, which then shifted to areas like nanotechnology and clean tech. While specialized funds might yield some successes, the continuous evolution in technology suggests that a more generalized approach is advantageous. Utah, in particular, has a strong history in software development across various forms, dating back to significant contributions like WordPerfect.

Utah's strengths in software have diversified into other areas such as cybersecurity, health IT, AI, and even social networking with notable companies like Ancestry.com. Recursion, for instance, utilizes AI for drug discovery and has attracted significant investment, including a $50 million investment from NVIDIA. This highlights Utah's growing influence in AI and tech innovation, supported by initiatives like the University of Utah's plans to build a significant AI complex.

Utah's venture capital landscape tends to favor tech startups due to their high return potential and generally lower capital requirements compared to non-tech startups. The return profile for tech investments is more appealing, with higher gross margins and quicker scaling capabilities. Non-tech startups, although successful in some instances, often face challenges in attracting venture capital due to longer timelines and less dramatic returns.

Investment criteria focus on technology disruption, market potential, and the caliber of entrepreneurs. Traits sought in founders include risk-taking, ambition, and the ability to build strong teams.

Future strategies will continue to focus on innovation and deeper engagement with stakeholders. Efforts are also underway to improve gender diversity in tech through intentional recruitment and support initiatives.

Social (networks and collaboration among actors) -

Collaboration between startups, investors, higher education institutions, and other stakeholders in Utah is notably strong. The pro-business stance of the state government, combined with cooperative efforts from universities and venture capitalists, fosters a supportive ecosystem for innovation. Universities in Utah have made significant strides in tech transfer and commercialization, with systematic approaches to support faculty and others in spinning out startups and creating business plans.

The venture capital community in Utah is highly collaborative, working well with each other and with startups to provide support and resources. This collaborative spirit extends to the startup ecosystem, where companies often help each other by becoming clients and promoting local innovation. The improved infrastructure and standardized processes for tech commercialization at universities further enhance this ecosystem.

Quality of Life

Despite some challenges in specific industries, Utah's diverse talent pool and the increasing number of tech companies have made it easier to attract and retain skilled professionals. The emergence of unicorn companies and the willingness of external companies to move operations to Utah highlight the state's growing appeal as a tech hub. This is largely due to Utah's high quality of life such as its outdoor assets, service-minded population, and strong economy.

APPENDIX 4:

Data Analysis Summaries

HUMAN CAPITAL DATA ANALYSIS SUMMARY

Table 4-1: Human Capital: Aeronautics/Space Exploration/Defense Innovation Ecosystem

Pre-graduation	Skill Development (Post-Grad/ Non-accredited) & Business Creation	R&D Activities and Commercialization
Various programs and degrees are tailored to the high-demand skills required in the aerospace and defense industry. **Primary and Secondary Education**: Utah students perform better in Math and Science than the country's average[43]. Utah prepares children for engineering and technology in the early stage of education by providing many pathways to support industry: • Engineering and Technology Pathway for junior high and high Schools • Utah Aerospace Pathway Certificate • Utah Rotor Pathway Program (URPP)[44] **Higher Education**: Utah State University leads the state in offering degrees in aerospace engineering and technology in the state's undergraduate and graduate programs, while the University of Utah leads in general engineering programs. Utah Valley University, Salt Lake Community College, and Southern Utah University offer degrees and certifications for technicians in airframe mechanics and aircraft maintenance technology. • Bachelor's degree completion rates in fields related to this industry have been increasing over time, while master's and Ph.D. graduation numbers have maintained roughly the same levels. • There are internship opportunities from collaboration between universities and industry, such as the University of Utah's Aerospace Scholar Program and the Air Force Reserve Officer Training Corps (AFROTC) program[45]. • Research universities offer numerous labs that give students hands-on experience and opportunities for experimentation, fostering innovation and technological advancement. • In Utah, there are only a small number of cybersecurity graduates[46], with available qualifications limited to certifications or master's degrees. However, there are a lot of colleges and universities offering cybersecurity degrees and certificates. The completion rate will potentially increase soon.	**Business Creations**: Businesses in the aeronautics, space exploration, and defense ecosystem typically incur significant fixed costs for innovation development. Greater consolidation of production and shared research and development could bring benefits from economies of scale to the industry.[47] The industry associated with this ecosystem is more concentrated with large firms (there are fewer smaller firms and startups) compared to other industries. New technologies in this ecosystem can be patented or commercialized through the Technology Licensing offices at major universities such as the University of Utah, Utah State University, and Brigham Young University. Faculty, students, researchers, and innovators can also receive support from the entrepreneurial institutes at these universities to launch their businesses. Examples include the Lassonde Entrepreneur Institute at the University of Utah, Utah Valley University's Entrepreneurship Institute, the Center for Entrepreneurship at Utah State University, and Rollins Center for Entrepreneurship & Technology at Brigham Young University. **Skill and Workforce Development**: USHE's Talent Ready Utah convenes industry, education, and other stakeholders to create, expand, and align workforce training and education solutions. Talent Ready Utah supports various multi-disciplinary initiatives as well as industry-specific programs, such as the Utah Defense Manufacturing Community's workforce development program. Other programs provide training and workshops for industries related to this ecosystem, such as the Utah Aeronautics Conference.	**R&D Activities**: The University of Utah, Utah State University, and Brigham Young University are highly ranked for R&D in science and engineering expenditure. In 2022, the University of Utah had an R&D expenditure of $670.1 million, placing it 47th in the rankings of national R&D expenditure. Utah State University spent $344.9 million on R&D in the same year, ranking 83rd. Brigham Young University's R&D expenditure was $45.6 million, placing it 222nd.[48] There are many research labs in both institutions that drive cutting-edge innovation and advancement, with many collaborating closely with the federal government. • The Aerospace Hub at the University of Utah supports highly competitive Aerospace research capabilities, team building, proposal development, and workforce development. • The Space Dynamics Lab at Utah State University collaborates with faculty and students in various types of advanced research in space missions and supporting software systems. **Commercialization:** University of Utah, Utah State University, and Brigham Young University provide services to facilitate the transfer of technologies for commercialization in the forms of patents, invention disclosures, and license agreements, as well as startups for faculty, researchers, students, and industry partners. • In 2023, the University of Utah's Technology Licensing Office reported $23.3 million in licensing revenue, with 23 licenses, 145 patents issued, 265 invention disclosures, and 7 startups.[49] • In FY 2023, USU's campus researchers and the USU Space Dynamics Laboratory secured $405.7 million in total awards, surpassing the previous record of 390.7 million in FY 2022. The university reported $3.04 million in revenue from commercialization and licensing, with 14 invention disclosures and 8 patents issued.[50] • According to the latest report from BYU's Technology Transfer Office, in 2020, BYU received $2.21 million in royalties, created 64 invention disclosures, issued 23 licenses, launched 7 startups, and obtained 29 patents. The state of Utah also supports commercialization across higher education through the Utah Innovation Lab, USHE's commercialization service. The lab empowers institutions that lack operational support for their commercialization projects.

Table 4-2: Human Capital: Energy Production Innovation Ecosystem

Pre-graduation	Skill Development (Post-Grad/Non-accredited) & Business Creation	R&D Activities and Commercialization
Primary and Secondary Education: The Utah Office of Energy Development provides the K-12 curriculum developed in collaboration with the Utah Science Teacher Association to help students understand the critical role of energy and minerals in their lives. Utah Office of Energy Development also offers Energy Pathways Scholarships for students pursuing a STEM degree at a Utah-based trade/tech school or college/university.[51] **Higher Education**: There are diverse programs and trainings offered for every level of education for the energy industry ranging from certificates and associate degrees in electrician training, industrial mechanics and technology, geographical information science, and pre-engineering, to bachelor's, master's, and doctoral degrees in geography, chemistry, and industrial/petroleum/environment/nuclear engineering. • The University of Utah's undergraduate nuclear program is one of fewer than 50 nuclear engineering programs in the U.S. • U-EPIC Energy & Workforce Training Partnership Program partnered with the industry to support skill development through industry-defined student projects, curriculum development, and workforce development events.[52] • Utah State University is creating an energy engineering program to address workforce and economic needs throughout Utah. The program will offer undergraduate and graduate degrees, as well as certificates.	**Business Creation:** New technologies in energy production can be patented or commercialized through the technology licensing offices at universities such as the University of Utah, Utah State University, and Brigham Young University. Faculty, students, researchers, and innovators can also receive support from the entrepreneurial institutes at these universities to launch their businesses. Examples include the Lassonde Entrepreneur Institute at the University of Utah, Utah Valley University's Entrepreneurship Institute, the Center for Entrepreneurship at Utah State University, and Rollins Center for Entrepreneurship & Technology at Brigham Young University. **Skill and Workforce Development**: • Technical and community colleges offer many certifications to help energy professionals gain the knowledge required to provide healthier, safer, and more energy-efficient environments. • U-EPIC Energy Center, by the University of Utah encourages students to pursue career paths in the energy sector by providing a Resilient Energy Certificate Program, Energy Workforce Training Partnership Program, testbed and facilities, and an energy career portal. • USHE's Talent Ready Utah convenes industry, education, and other stakeholders to create, expand, and align workforce training and education solutions. Talent Ready Utah supports various multi-disciplinary initiatives across Utah.	**R&D Activities:** • There are many research centers and labs for energy research, especially at the University of Utah and Utah State University. Research centers include Utah Energy & Power Innovation Center (U-EPIC), Energy & Geoscience Institute, Institute for Clean and Secure Energy, Southwest Co2 Sequestration Partnership, ASPIRE (a National Science Foundation Engineering Research Center at USU dedicated to researching electrification of transportation), USU's Bingham Research Center, and U-Smart Campus. • Utah State University hosts the Energy Technology Research & Innovation Lab (eTRI) to research and develop clean and efficient energy systems, component technologies, and novel thermal transport processes in energy conversion and storage. The research evidence is shown through many publications and inventions.[53] • The Utah state government's San Rafael Energy Research Center focuses its research on nuclear and solar energy, power cycle technology, and manufacturing. **Commercialization:** University of Utah, Utah State University, and Brigham Young University provide services to facilitate the transfer of technologies for commercialization in the forms of patents, invention disclosures, and license agreements, as well as startups for faculty, researchers, students, and industry partners. • In 2023, the University of Utah's Technology Licensing Office reported $23.3 million in licensing revenue, with 23 licenses, 145 patents issued, 265 invention disclosures, and 7 startups.[54] • In FY 2023, USU's campus researchers and the USU Space Dynamics Laboratory secured $405.7 million in total awards, surpassing the previous record of 390.7 million in FY 2022. The university reported $3.04 million in revenue from commercialization and licensing, with 14 invention disclosures and 8 patents issued.[55] • According to the latest report from BYU's Technology Transfer Office, in 2020, BYU received $2.21 million in royalties, created 64 invention disclosures, issued 23 licenses, launched 7 startups, and obtained 29 patents. The state of Utah also supports commercialization across higher education through the Utah Innovation Lab, USHE's commercialization service. The lab empowers institutions that lack operational support for their commercialization projects.

Table 4-3: Human Capital: Finance, Fintech, and Headquarters Innovation Ecosystem

Pre-graduation	Skill Development (Post-Grad/Non-accredited) & Business Creation	R&D Activities and Commercialization
Primary and Secondary Education: • Utah earned an "A" grade in financial literacy from the Nation's Report Card, becoming the first state to require a stand-alone half-credit General Financial Literacy course for high school graduation.[56] • Utah Council on Financial and Economic Education collaborates with private and public entities to strengthen Utah's K-12 financial education requirements and support and raise awareness of resources and initiatives that promote financial wellness in Utah. **Higher Education:** • Numerous institutions across the state offer robust entrepreneurship programs, courses, and centers. • Several universities, such as the University of Utah and Southern Utah University, provide opportunities for students to manage high-value portfolios to get hands-on experience in the financial industry. • Westminster University - Center for Financial Wellness provides experiential learning for students in tax preparation and financial advocacy and a financial lab facility. • The Stena Center for Financial Technology at the University of Utah partners with LoanPro to help accelerate and incubate advances that will strengthen Utah fintech while also providing hands-on experience for students. • Completion of bachelor's and master's degrees in finance and economics gradually increased over the past five years while the number of Ph.D. graduates in these fields dropped over the same period. **Potential Gap:** University of Utah is the only institution offering a degree emphasizing fintech. Given the rapid advancements in technology and the increasing demand in the fintech industry, there is a notable gap in curricula specifically designed to serve Utah's fintech industry.	**Business Creation**: New financial technology can be patented or commercialized through the Technology Licensing offices at major universities such as the University of Utah, Utah State University, and Brigham Young University. Faculty, students, researchers, and innovators can also receive support from the entrepreneurial institutes at these universities to launch their businesses. Examples include the Lassonde Entrepreneur Institute at the University of Utah, Utah Valley University's Entrepreneurship Institute, the Center for Entrepreneurship at Utah State University, and Rollins Center for Entrepreneurship & Technology at Brigham Young University. **Skill and Workforce Development**: • The Utah Bankers Association offers a series of annual development programs designed to help develop the leaders in Utah's banking industry. The courses include an executive development program, a credit analyst development program, and a commercial lending development program. • Given dynamic technological advancements, financial firms have gradually shifted towards skills-based hiring and mobility to build a versatile workforce[57]. Utah's employment growth in information and financial activities in the past year has been slowing down[58], and some occupation employment projections in the traditional financial industry, such as tellers, are dropping.[59] • USHE's Talent Ready Utah convenes industry, education, and other stakeholders to create, expand, and align workforce training and education solutions. Talent Ready Utah supports various multi-disciplinary initiatives across Utah.	**R&D Activities:** Financial innovation research centers are only located at the University of Utah. • Stena Center for Financial Technology at the University of Utah aims to accelerate financial innovation and inclusion. The center provides workshops, labs, research, annual conferences, and other projects and programs for students, faculty, and industry partners. • Utah Center for Financial Services (UCFS) focuses on state-chartered banks' challenges. It explores how innovation can enhance financial services for under-served communities and develop policy recommendations to improve the use of technology in delivering these services.[60] • The University of Utah's Lassonde Entrepreneur Institute and Sorenson Impact Institute, partnered with local, state, and federal governments, venture capital funds, and financial institutions, play roles in supporting financial innovation startups and helping bridge the gap between private capital and social and environmental needs such as community equity funds and outcomes-based financing projects. **Commercialization:** University of Utah, Utah State University, and Brigham Young University provide services to facilitate the transfer of technologies for commercialization in the forms of patents, invention disclosures, and license agreements, as well as startups for faculty, researchers, students, and industry partners. • In 2023, the University of Utah's Technology Licensing Office reported $23.3 million in licensing revenue, with 23 licenses, 145 patents issued, 265 invention disclosures, and 7 startups.[61] • In FY 2023, USU's campus researchers and the USU Space Dynamics Laboratory secured $405.7 million in total awards, surpassing the previous record of 390.7 million in FY 2022. The university reported $3.04 million in revenue from commercialization and licensing, with 14 invention disclosures and 8 patents issued.[62] • According to the latest report from BYU's Technology Transfer Office, in 2020, BYU received $2.21 million in royalties, created 64 invention disclosures, issued 23 licenses, launched 7 startups, and obtained 29 patents. The state of Utah also supports commercialization across higher education through the Utah Innovation Lab, USHE's commercialization service. The lab empowers institutions that lack operational support for their commercialization projects.

Table 4-4: Human Capital: Health Care and Life Sciences Innovation Ecosystem

Pre-graduation	Skill Development (Post-Grad/Non-accredited) & Business Creation	R&D Activities and Commercialization
Primary and Secondary Education: Utah fosters health science education, starting from early stages to advanced degrees, creating a comprehensive ecosystem for skill development. The state offers a Health Science pathway curriculum for junior high/middle school students, emphasizing biotechnology, exercise science/sport medicine, psychology, and behavioral health. **Higher Education:** • Colleges and universities in Utah support advances in life sciences and health care innovation. From 2000 to 2021, STEM degree completions as a share of total degree completions at USHE institutions increased the most at the University of Utah and Utah Valley University.[63] **Potential Strengths**: • The University of Utah leads the state in both bachelor's and doctorate degrees in biomedical fields, showing a strong pipeline from undergraduate to professional practice. • BioUtah, an industry trade association, collaborated with USHE's Talent Ready Utah program and the state to form the Life Science Workforce Initiative in 2023. The state will incentivize Utah colleges and universities for additional high-yield degree graduates.	**Business Creation:** New research discoveries in life sciences can be patented or commercialized through the technology licensing offices at major universities such as the University of Utah, Utah State University, and Brigham Young University. Faculty, students, researchers, and innovators can also receive support from the entrepreneurial institutes at these universities to launch their businesses. Examples include the Lassonde Entrepreneur Institute at the University of Utah, Utah Valley University's Entrepreneurship Institute, the Center for Entrepreneurship at Utah State University, and Rollins Center for Entrepreneurship & Technology at Brigham Young University. **Skill and Workforce Development:** • ARUP Laboratories Institute for Learning provides continuing education resources for laboratory professionals and free continuing education credits. • BioHive provides professional development, such as clinical research and entrepreneurship workshops and seminars, resources and support for students interested in internships, job opportunities, or further education in the biotech and healthtech fields. Current active chapters exist at Brigham Young University, Utah State University, University of Utah, Utah Valley University, and Utah Tech University.[64] • USHE's Talent Ready Utah convenes industry, education, and other stakeholders to create, expand, and align workforce training and education solutions. Talent Ready Utah supports various multi-disciplinary initiatives as well as industry-specific programs such as the Behavioral Health Initiative, Healthcare Equipment for Student Training, Healthcare Targeted Workforce Development, and Healthcare Workforce programs.	**R&D Activities:** • Life sciences research at Utah's public and private higher education institutions attracts a substantial amount of out-of-state funding. From FY 2018 to FY 2022, Utah received an average of $279.5 million annually in NIH funding, led by the University of Utah, Utah State University, and Brigham Young University.[65] **Commercialization:** University of Utah, Utah State University, and Brigham Young University provide services to facilitate the transfer of technologies for commercialization in the forms of patents, invention disclosures, and license agreements, as well as startups for faculty, researchers, students, and industry partners. • In 2023, the University of Utah's Technology Licensing Office reported $23.3 million in licensing revenue, with 23 licenses, 145 patents issued, 265 invention disclosures, and 7 startups.[66] • In FY2023, USU's campus researchers and the USU Space Dynamics Laboratory secured $405.7 million in total awards, surpassing the previous record of 390.7 million in FY 2022. The university reported $3.04 million in revenue from commercialization and licensing, with 14 invention disclosures and 8 patents issued.[67] • According to the latest report from BYU's Technology Transfer Office, in 2020, BYU received $2.21 million in royalties, created 64 invention disclosures, issued 23 licenses, launched 7 startups, and obtained 29 patents. • From 2018 to 2022, the annual number of life science invention disclosures averaged 145.6 per year at the University of Utah and 6.6 at Utah State University. Their five-year averages for life science patents issued were 159.8 and 5.0 patents per year, respectively. The total number of license agreements in life sciences over five years was 77 for the University of Utah and 19 for Utah State University. 34 life sciences startups came from the University of Utah and one from Utah State University.[68] • Utah State University created a significant number of Biotech patents issued (19) from 2018 to 2022. The University of Utah's majority of life sciences innovation concentrates in medical devices and diagnostics. The state of Utah also supports commercialization across higher education through the Utah Innovation Lab, USHE's commercialization service. The lab empowers institutions that lack operational support for their commercialization projects.

Table 4-5: Human Capital: Technology and Information Systems Innovation Ecosystem

Pre-graduation	Skill Development (Post-Grad/Non-accredited) & Business Creation	R&D Activities and Commercialization
Primary and Secondary Education: Utah fosters computer science and information technology education, starting from early stages to advanced degrees, creating a comprehensive ecosystem for skill development. The state offers a Computer Science and Information Technology pathway curriculum for junior high/middle school students, emphasizing coding, programming, web development, and robotics. **Higher Education**: All public and private higher education institutions in Utah offer degrees and certificates in computer sciences and technology, with technical schools providing associate degrees in the field. • The number of new engineering and computer science graduates increased over the past two decades and outpaced the nation by more than double, largely due to the Utah Engineering and Computer Science Initiative[69]. The projected employment in Utah engineering and computer sciences exceeds the projected growth in other occupations through 2028, surpassing in-state labor availability. [70] • The University of Utah's Computer Science graduate school ranks 42nd nationally.[71]	**Business Creation:** New ideas in technology and information systems can be patented or commercialized through the technology licensing offices at major universities such as the University of Utah, Utah State University, and Brigham Young University. Faculty, students, researchers, and innovators can also receive support from the entrepreneurial institutes at these universities to launch their businesses. Examples include the Lassonde Entrepreneur Institute at the University of Utah, Utah Valley University's Entrepreneurship Institute, the Center for Entrepreneurship at Utah State University, and Rollins Center for Entrepreneurship & Technology at Brigham Young University. **Skill and Workforce Development**: USHE's Talent Ready Utah convenes industry, education, and other stakeholders to create, expand, and align workforce training and education solutions. Talent Ready Utah supports various multi-disciplinary initiatives as well as industry-specific programs such as the Computer Science Targeted Workforce Development and Deep Technology Talent programs. Higher education in Utah supports continuous skill development after graduation through various initiatives and programs by collaborating with online learning platforms.[72]	**R&D Activities:** • The University of Utah's School of Computing has enhanced many research areas in the computer sciences and technology, such as algorithms, AI and machine learning, computer architecture, robotics, security/privacy, human-centered computing, and high-performance computing. • Utah State University has received significant funding in many computer sciences areas from the federal government (e.g., National Science Foundation and U.S. Department of Energy), as well as from nonprofit organizations.[73] **Commercialization:** University of Utah, Utah State University, and Brigham Young University provide services to facilitate the transfer of technologies for commercialization in the forms of patents, invention disclosures, and license agreements, as well as startups for faculty, researchers, students, and industry partners. • In 2023, the University of Utah's Technology Licensing Office reported $23.3 million in licensing revenue, with 23 licenses, 145 patents issued, 265 invention disclosures, and 7 startups.[74] • In FY 2023, USU's campus researchers and the USU Space Dynamics Laboratory secured $405.7 million in total awards, surpassing the previous record of 390.7 million in FY 2022. The university reported $3.04 million in revenue from commercialization and licensing, with 14 invention disclosures and 8 patents issued.[75] • According to the latest report from BYU's Technology Transfer Office, in 2020, BYU received $2.21 million in royalties, created 64 invention disclosures, issued 23 licenses, launched 7 startups, and obtained 29 patents. The state of Utah also supports commercialization across higher education through the Utah Innovation Lab, USHE's commercialization service. The lab empowers institutions that lack operational support for their commercialization projects.

FINANCIAL CAPITAL DATA ANALYSIS SUMMARY

Table 4-6: Financial Capital: Aeronautics/Space Exploration/Defense Innovation Ecosystem

State/Local Tax System and Business Incentive Programs	Local/State/Federal Government Funding & Commercialization Programs	Venture/Other Capital Availability
Tax System **Corporate Income Tax:** Utah has a flat 4.55% corporate income tax and ranks 8th best overall in the Tax Foundation's 2024 State Business Tax Climate Index. **Utah New Market Tax Credit**: In 2014, the Utah Legislature enacted the Utah Small Business Jobs Act to attract additional investment in the most severely distressed areas of the state. New Market Tax Credit programs are an effective tool used by the federal government and 13 states, including Utah, to attract private capital investment in areas in need of job growth and economic opportunities. **Credit for Increasing Research Activities in Utah**: This credit equals: 1) 5% of qualified expenses for increasing research activities in Utah above a base amount; 2) 5% of certain payments made to a qualified organization increasing basic research in Utah above a base amount; and 3) 7.5% of qualified research expenses in Utah for the current taxable year. **Local Tax Increment Financing (TIF) programs:** Many Utah counties and municipalities also offer tax credits to qualifying companies. **Business Incentives** Utah's business incentives are generally considered average by the site selector community.[76] While there are tax incentives and credits for larger companies, there are fewer options for small companies and startups. **EDTIF**: The Utah Legislature created the Economic Development Tax Increment Financing (EDTIF) corporate incentive program in 2005 to offer tax credits to qualifying companies. The EDTIF tax credit is a post-performance, refundable tax credit for up to 50% of new state revenues (sales, corporate, and withholding taxes paid to the state) over the life of the project (typically 5-10 years) (funds can be up to 50% for a rural project). The incentive is available to Utah companies and others seeking to relocate or expand operations to Utah. As the state's needs and economy continue to evolve, the Legislature fine-tunes the EDTIF program to maintain Utah's robust environment for economic development. The EDTIF program is available for companies expanding in targeted industries in urban counties. These targeted industries include (bolded industries below most closely align with the ecosystem): • **Advanced Manufacturing** • **Aerospace and Defense** • Financial Services • Life Sciences and Health Care • Software and Information Technology **Industrial Assistance Account** (IAA): The IAA is a post-performance grant for the creation of high-paying Utah jobs.	**Funding Programs** There are not significant amounts of governmental funds available at the local level; however, the local ecosystem can tap into federal funds, such as SBIR, or into state funds, such as the Utah Innovation Fund. The state of Utah created the Utah Innovation Fund to help commercialized technologies discovered, advanced, or developed at Utah's higher education institutions. The fund supports promising startups across multiple industries. **Utah Innovation Center**: The Utah Innovation Center is a current Federal And State Technology (FAST) Partnership Program recipient housed within GOEO. It assists small businesses statewide to apply for the federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funding programs. The Center offers a full range of services to small businesses interested in SBIR and STTR funding with a special focus on underserved populations including ethnic and racial minorities, women, and rural communities. Services include consultations; training, workshops, and seminars; proposal guidance and evaluation; editing and writing; submission assistance; and microgrants and loans to help bridge the funding gap. **Commercialization** **Utah Small Business Development Center**: Hosted at Salt Lake Community College, the Utah Small Business Development Center Network (SBDC), with 14 locations across Utah, provides free one-on-one confidential evaluation and guidance by knowledgeable advisors with real-life business experience. Its centers provide workshops, conferences and free or low-cost training programs that deliver information to assist in developing necessary business skills. **Governor's Office of Economic Opportunity**: Utah's Procurement Technical Assistance Center (PTAC) helps innovative firms sell their products to government agencies, assist with commercialization plans for those interested in selling to the government, understand how to register in the U.S. System for Award Management (SAM), and much more. **Utah Manufacturing Extension Partnership**: The University of Utah Manufacturing Extension Partnership (UUMEP) Center is the statewide manufacturing assistance center funded by the National Institute of Standards and Technology (NIST) Manufacturing Extension Partnership. The UUMEP Center's mission is to deliver customized services to improve all aspects of manufacturing—from the production floor to the front office. Key areas of focus are in food manufacturing, operational excellence, workforce training, advanced manufacturing, growth & innovation, and investment access. The UUMEP Center staff visits clients on-site to discuss their needs, develops a customized solution or project, delivers and manages the custom project, and continuously ensures the project meets the client's desired outcomes.	**Venture Capital** According to PitchBook, companies headquartered in Utah in the Advanced Manufacturing, Cybersecurity, Robotics & Drones, and Space Technology industry verticals* experienced 13 deals in 2023, down from 19 in 2022. Total capital invested decreased from about $113 million in 2022 to near $67 million in 2023. While year-over declines were large in 2023, total capital invested in Utah's Advanced Manufacturing/Cybersecurity/Robotics & Drones/Space Technology firms has increased over time (2023 total capital invested represents 4.4x the amount in 2013). *PitchBook's Advanced Manufacturing, Cybersecurity, Robotics & Drones, and Space Technology industry verticals definition likely differs from GOEO's Advanced Manufacturing and Aerospace & Defense industry definitions or other industry definitions used across the state. However, PitchBook's data still provide adequate context to the amount of venture capital flowing to innovators and startups in this ecosystem. While venture capital is available in the aeronautics, space exploration, and defense ecosystem, it is difficult to acquire primarily due to high capital start-up costs and length of time needed for an investor exit.

Table 4-7: Financial Capital: Energy Production Innovation Ecosystem

State/Local Tax System and Business Incentive Programs	Local/State/Federal Government Funding & Commercialization Programs	Venture/Other Capital Availability
Tax System **Corporate Income Tax:** Utah has a flat 4.55% corporate income tax and ranks 8th best overall in the Tax Foundation's 2024 State Business Tax Climate Index. **Utah New Market Tax Credit**: In 2014, the Utah Legislature enacted the Utah Small Business Jobs Act to attract additional investment in the most severely distressed areas of the state. New Market Tax Credit programs are an effective tool used by the federal government and 13 states, including Utah, to attract private capital investment in areas in need of job growth and economic opportunities. **Credit for Increasing Research Activities in Utah**: This credit is: 1) 5% of qualified expenses for increasing research activities in Utah above a base amount; 2) 5% of certain payments made to a qualified organization increasing basic research in Utah above a base amount; and 3) 7.5% of qualified research expenses in Utah for the current taxable year. **Local Tax Increment Financing** (TIF) programs: Many Utah counties and municipalities also offer tax credits to qualifying companies. **Business Incentives** Utah's business incentives are generally considered average by the site selector community.[77] While there are tax incentives and credits for larger companies, there are fewer options for small companies. **EDTIF**: The Utah Legislature created the Economic Development Tax Increment Financing (EDTIF) corporate incentive program in 2005 to offer tax credits to qualifying companies. The EDTIF tax credit is a post-performance, refundable tax credit for up to 50% of new state revenues (sales, corporate, and withholding taxes paid to the state) over the life of the project (typically 5-10 years) (funds can be up to 50% for a rural project). The incentive is available to Utah companies and others seeking to relocate or expand operations to Utah. As the state's needs and economy continue to evolve, the Legislature fine-tunes the EDTIF program to maintain Utah's robust environment for economic development. The EDTIF program is available for companies expanding in targeted industries in urban counties. These targeted industries include: • Advanced Manufacturing • Aerospace and Defense • Financial Services • Life Sciences and Health Care • Software and Information Technology While energy production may not specifically be a targeted industry, it often includes either heavy manufacturing, tech, or advanced manufacturing and may qualify for these incentives. **Industrial Assistance Account** (IAA): The IAA is a post-performance grant for the creation of high-paying Utah jobs.	**Funding Programs** There are not significant amounts of governmental funds available at the local level; however, the local ecosystem can tap into federal funds, such as SBIR, or into state funds, such as the Utah Innovation Fund. The state of Utah created the Utah Innovation Fund to help commercialized technologies discovered, advanced, or developed at Utah's higher education institutions. The fund supports promising startups across multiple industries. Tax credits and incentives are available for large companies but are not generally available for small companies / startups. **Utah Innovation Center**: The Utah Innovation Center is a current Federal And State Technology (FAST) Partnership Program recipient housed within GOEO. It assists small businesses statewide to apply for the federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funding programs, giving Utah technology-oriented companies a distinct advantage in today's competitive environment. The Center offers a full range of services to small businesses interested in SBIR and STTR funding with a special focus on underserved populations including ethnic and racial minorities, women, and rural communities. Services include consultations; training, workshops, and seminars; proposal guidance and evaluation; editing and writing; submission assistance; and microgrants and loans to help bridge the funding gap. **Commercialization** **Utah Small Business Development Center**: Hosted at Salt Lake Community College, the Utah Small Business Development Center Network (SBDC), with 14 locations across Utah, provides free one-on-one confidential evaluation and guidance by knowledgeable advisors with real-life business experience. Its centers provide valuable workshops, conferences and free or low-cost training programs that deliver important information to assist in cultivating necessary business skillsets. **Governor's Office of Economic Opportunity**: Utah's Procurement Technical Assistance Center (PTAC) helps innovative firms sell their products to government agencies, assist with commercialization plans for those interested in selling to the government, understand how to register in the U.S. System for Award Management (SAM), and much more.	**Venture Capital** According to PitchBook, companies headquartered in Utah in the Energy industry* experienced 8 deals in 2023, about the same as 2022's 9 deals. Total capital invested decreased from about $41 million in 2022 to about $15 million in 2023. Capital invested in energy companies with headquarters in Utah has not grown significantly over time (2023 total capital invested represents 1.05x the amount in 2013). *PitchBook's Energy industry definition likely differs from energy industry definitions used in the state. However, PitchBook's data still provide adequate context to the amount of venture capital flowing to innovators and startups in this ecosystem.

Table 4-8: Financial Capital: Finance, Fintech, and Headquarters Innovation Ecosystem

State/Local Tax System and Business Incentive Programs	Local/State/Federal Government Funding & Commercialization Programs	Venture/Other Capital Availability
Tax System **Corporate Income Tax:** Utah has a flat 4.55% corporate income tax and ranks 8th best overall in the Tax Foundation's 2024 State Business Tax Climate Index. **Utah New Market Tax Credit**: In 2014, the Utah Legislature enacted the Utah Small Business Jobs Act to attract additional investment in the most severely distressed areas of the state. New Market Tax Credit programs are an effective tool used by the federal government and 13 states, including Utah, to attract private capital investment in areas in need of job growth and economic opportunities. **Credit for Increasing Research Activities in Utah**: This credit is: 1) 5% of qualified expenses for increasing research activities in Utah above a base amount; 2) 5% of certain payments made to a qualified organization increasing basic research in Utah above a base amount; and 3) 7.5% of qualified research expenses in Utah for the current taxable year. **Local Tax Increment Financing** (TIF) programs: Many Utah counties and municipalities also offer tax credits to qualifying companies. **Business Incentives** Utah's business incentives are generally considered average by the site selector community.[78] While there are tax incentives and credits for larger companies, there are fewer options for small companies. **EDTIF**: The Utah Legislature created the Economic Development Tax Increment Financing (EDTIF) corporate incentive program in 2005 to offer tax credits to qualifying companies. The EDTIF tax credit is a post-performance, refundable tax credit for up to 50% of new state revenues (sales, corporate, and withholding taxes paid to the state) over the life of the project (typically 5-10 years) (funds can be up to 50% for a rural project). The incentive is available to Utah companies and others seeking to relocate or expand operations to Utah. As the state's needs and economy continue to evolve, the Legislature fine-tunes the EDTIF program to maintain Utah's robust environment for economic development. The EDTIF program is available for companies expanding in targeted industries in urban counties. These targeted industries include (bolded industry below most closely aligns with the ecosystem): • Advanced Manufacturing • Aerospace and Defense • **Financial Services** • Life Sciences and Health Care • Software and Information Technology **Industrial Assistance Account** (IAA): The IAA is a post-performance grant for the creation of high-paying Utah jobs.	**Funding Programs** There are not significant amounts of governmental funds available at the local level; however, the local ecosystem can tap into federal funds, such as SBIR, or into state funds, such as the Utah Innovation Fund. The state of Utah created the Utah Innovation Fund to help commercialized technologies discovered, advanced, or developed at Utah's higher education institutions. The fund supports promising startups across multiple industries. Tax credits and incentives are available for large companies but are not generally available for small companies / startups. **Utah Innovation Center**: The Utah Innovation Center is a current Federal And State Technology (FAST) Partnership Program recipient housed within GOEO. It assists small businesses statewide to apply for the federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funding programs, giving Utah technology-oriented companies a distinct advantage in today's competitive environment. The Center offers a full range of services to small businesses interested in SBIR and STTR funding with a special focus on underserved populations including ethnic and racial minorities, women, and rural communities. Services include consultations; training, workshops, and seminars; proposal guidance and evaluation; editing and writing; submission assistance; and microgrants and loans to help bridge the funding gap. **Commercialization** **Utah Small Business Development Center**: Hosted at Salt Lake Community College, the Utah Small Business Development Center Network (SBDC), with 14 locations across Utah, provides free one-on-one confidential evaluation and guidance by knowledgeable advisors with real-life business experience. Its centers provide valuable workshops, conferences and free or low-cost training programs that deliver important information to assist in cultivating necessary business skillsets. **Governor's Office of Economic Opportunity**: Utah's Procurement Technical Assistance Center (PTAC) helps innovative firms sell their products to government agencies, assist with commercialization plans for those interested in selling to the government, understand how to register in the U.S. System for Award Management (SAM), and much more.	**Venture Capital** According to PitchBook, companies headquartered in Utah in the Financial Services industry* experienced 26 deals in 2023, down from 39 in 2022. Total capital invested decreased from about $728 million in 2022 to about $78 million in 2023. While year-over declines were large in 2023, total capital invested in Utah's Financial Services firms has increased over time (2023 total capital invested represents 16.5x the amount in 2003). *PitchBook's Financial Services industry definition likely differs from GOEO's Financial Services industry definition or other industry definitions used across the state. However, PitchBook's data still provide adequate context to the amount of venture capital flowing to innovators and startups in this ecosystem.

Table 4-9: Financial Capital: Health Care and Life Sciences Innovation Ecosystem

State/Local Tax System and Business Incentive Programs	Local/State/Federal Government Funding & Commercialization Programs	Venture/Other Capital Availability
Tax System **Corporate Income Tax:** Utah has a flat 4.55% corporate income tax and ranks 8th best overall in the Tax Foundation's 2024 State Business Tax Climate Index. **Utah New Market Tax Credit**: In 2014, the Utah Legislature enacted the Utah Small Business Jobs Act to attract additional investment in the most severely distressed areas of the state. New Market Tax Credit programs are an effective tool used by the federal government and 13 states, including Utah, to attract private capital investment in areas in need of job growth and economic opportunities. **Credit for Increasing Research Activities in Utah**: This credit is: 1) 5% of qualified expenses for increasing research activities in Utah above a base amount; 2) 5% of certain payments made to a qualified organization increasing basic research in Utah above a base amount; and 3) 7.5% of qualified research expenses in Utah for the current taxable year. **Technology and Life Science Tax Credits**: During the 2016 general session, the Utah Legislature changed the Technology and Life Science Economic Development Act, giving the Governor's Office of Economic Opportunity authority to issue tax credits to qualifying technology and life science investors. Eligible investors may submit applications for tax credits drawn from $300,000 of funds expressly set aside by the Legislature. **Local Tax Increment Financing** (TIF) programs: Many Utah counties and municipalities also offer tax credits to qualifying companies. **Business Incentives** Utah's business incentives are generally considered average by the site selector community.[79] While there are tax incentives and credits for larger companies, there are fewer options for small companies. **EDTIF**: The Utah Legislature created the Economic Development Tax Increment Financing (EDTIF) corporate incentive program in 2005 to offer tax credits to qualifying companies. The EDTIF tax credit is a post-performance, refundable tax credit for up to 50% of new state revenues (sales, corporate, and withholding taxes paid to the state) over the life of the project (typically 5-10 years) (funds can be up to 50% for a rural project). The incentive is available to Utah companies and others seeking to relocate or expand operations to Utah. As the state's needs and economy continue to evolve, the Legislature fine-tunes the EDTIF program to maintain Utah's robust environment for economic development. The EDTIF program is available for companies expanding in targeted industries in urban counties. These targeted industries include (bolded industry below most closely aligns with the ecosystem): • Advanced Manufacturing • Aerospace and Defense • Financial Services • **Life Sciences and Health Care** • Software and Information Technology **Industrial Assistance Account** (IAA): The IAA is a post-performance grant for the creation of high-paying Utah jobs.	**Funding Programs** There are not significant amounts of governmental funds available at the local level; however, the local ecosystem can tap into federal funds, such as SBIR, or into state funds, such as the Utah Innovation Fund. The state of Utah created the Utah Innovation Fund to help commercialized technologies discovered, advanced, or developed at Utah's higher education institutions. The fund supports promising startups across multiple industries. Tax credits and incentives are available for large companies but are not generally available for small companies / startups. **Utah Innovation Center**: The Utah Innovation Center is a current Federal And State Technology (FAST) Partnership Program recipient housed within GOEO. It assists small businesses statewide to apply for the federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funding programs, giving Utah technology-oriented companies a distinct advantage in today's competitive environment. The Center offers a full range of services to small businesses interested in SBIR and STTR funding with a special focus on underserved populations including ethnic and racial minorities, women, and rural communities. Services include consultations; training, workshops, and seminars; proposal guidance and evaluation; editing and writing; submission assistance; and microgrants and loans to help bridge the funding gap. **Commercialization** **Utah Small Business Development Center**: Hosted at Salt Lake Community College, the Utah Small Business Development Center Network (SBDC), with 14 locations across Utah, provides free one-on-one confidential evaluation and guidance by knowledgeable advisors with real-life business experience. Its centers provide valuable workshops, conferences and free or low-cost training programs that deliver important information to assist in cultivating necessary business skillsets. **Governor's Office of Economic Opportunity**: Utah's Procurement Technical Assistance Center (PTAC) helps innovative firms sell their products to government agencies, assist with commercialization plans for those interested in selling to the government, understand how to register in the U.S. System for Award Management (SAM), and much more.	**Venture Capital** According to PitchBook, companies headquartered in Utah in the HealthTech and Life Sciences industry verticals* experienced 44 deals in 2023, about the same as 2022's 45 deals. Total capital invested edged upwards from about $366 million in 2022 to about $377 million in 2023. Capital invested in HealthTech and Life Sciences companies with headquarters in Utah has grown significantly over time (2023 total capital invested represents 2.4x the amount in 2013 and 48.9x the amount in 2003). *PitchBook's HealthTech and Life Sciences industry verticals definition likely differs from GOEO's Life Sciences and Health care industry definition or other industry definitions used across the state. However, PitchBook's data still provide adequate context to the amount of venture capital flowing to innovators and startups in this ecosystem.

Table 4-10: Financial Capital: Technology and Information Systems Innovation Ecosystem

State/Local Tax System and Business Incentive Programs	Local/State/Federal Government Funding & Commercialization Programs	Venture/Other Capital Availability
Tax System **Corporate Income Tax:** Utah has a flat 4.55% corporate income tax and ranks 8th best overall in the Tax Foundation's 2024 State Business Tax Climate Index. **Utah New Market Tax Credit**: In 2014, the Utah Legislature enacted the Utah Small Business Jobs Act to attract additional investment in the most severely distressed areas of the state. New Market Tax Credit programs are an effective tool used by the federal government and 13 states, including Utah, to attract private capital investment in areas in need of job growth and economic opportunities. **Credit for Increasing Research Activities in Utah**: This credit is: 1) 5% of qualified expenses for increasing research activities in Utah above a base amount; 2) 5% of certain payments made to a qualified organization increasing basic research in Utah above a base amount; and 3) 7.5% of qualified research expenses in Utah for the current taxable year. **Technology and Life Science Tax Credits**: During the 2016 general session, the Utah Legislature changed the Technology and Life Science Economic Development Act, giving the Governor's Office of Economic Opportunity authority to issue tax credits to qualifying technology and life science investors. Eligible investors may submit applications for tax credits drawn from $300,000 of funds expressly set aside by the Legislature. **Local Tax Increment Financing** (TIF) programs: Many Utah counties and municipalities also offer tax credits to qualifying companies. **Business Incentives** Utah's business incentives are generally considered average by the site selector community.[80] While there are tax incentives and credits for larger companies, there are fewer options for small companies. **EDTIF**: The Utah Legislature created the Economic Development Tax Increment Financing (EDTIF) corporate incentive program in 2005 to offer tax credits to qualifying companies. The EDTIF tax credit is a post-performance, refundable tax credit for up to 50% of new state revenues (sales, corporate, and withholding taxes paid to the state) over the life of the project (typically 5-10 years) (funds can be up to 50% for a rural project). The incentive is available to Utah companies and others seeking to relocate or expand operations to Utah. As the state's needs and economy continue to evolve, the Legislature fine-tunes the EDTIF program to maintain Utah's robust environment for economic development. The EDTIF program is available for companies expanding in targeted industries in urban counties. These targeted industries include (bolded industry below most closely aligns with the ecosystem): • Advanced Manufacturing • Aerospace and Defense • Financial Services • Life Sciences and Health Care • **Software and Information Technology** **Industrial Assistance Account** (IAA): The IAA is a post-performance grant for the creation of high-paying Utah jobs.	**Funding Programs** There are not significant amounts of governmental funds available at the local level; however, the local ecosystem can tap into federal funds, such as SBIR, or into state funds, such as the Utah Innovation Fund. The state of Utah created the Utah Innovation Fund to help commercialized technologies discovered, advanced, or developed at Utah's higher education institutions. The fund supports promising startups across multiple industries. Tax credits and incentives are available for large companies but are not generally available for small companies / startups. **Utah Innovation Center**: The Utah Innovation Center is a current Federal And State Technology (FAST) Partnership Program recipient housed within GOEO. It assists small businesses statewide to apply for the federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funding programs, giving Utah technology-oriented companies a distinct advantage in today's competitive environment. The Center offers a full range of services to small businesses interested in SBIR and STTR funding with a special focus on underserved populations including ethnic and racial minorities, women, and rural communities. Services include consultations; training, workshops, and seminars; proposal guidance and evaluation; editing and writing; submission assistance; and microgrants and loans to help bridge the funding gap. **Commercialization** **Utah Small Business Development Center**: Hosted at Salt Lake Community College, the Utah Small Business Development Center Network (SBDC), with 14 locations across Utah, provides free one-on-one confidential evaluation and guidance by knowledgeable advisors with real-life business experience. Its centers provide valuable workshops, conferences and free or low-cost training programs that deliver important information to assist in cultivating necessary business skillsets. **Governor's Office of Economic Opportunity**: Utah's Procurement Technical Assistance Center (PTAC) helps innovative firms sell their products to government agencies, assist with commercialization plans for those interested in selling to the government, understand how to register in the U.S. System for Award Management (SAM), and much more.	**Venture Capital** According to PitchBook, companies headquartered in Utah in the Information Technology industry* experienced 135 deals in 2023, down from 205 in 2022. Total capital invested decreased from about $2,260 million in 2022 to about $707 million in 2023. While year-over declines were large in 2023, total capital invested in Utah IT firms has increased over time (2023 total capital invested represents 2.8x the amount in 2013 and 12.5x the amount in 2003). *PitchBook's Information Technology industry definition likely differs from GOEO's Software and IT industry definition or other industry definitions used across the state. However, PitchBook's data still provide adequate context to the amount of venture capital flowing to innovators and startups in this ecosystem.

PHYSICAL AND SOCIAL INFRASTRUCTURE DATA ANALYSIS SUMMARY

Table 4-11: Infrastructure: Aeronautics/Space Exploration/Defense Innovation Ecosystem

Physical (Incubation/lab space, research facilities, innovation hubs and districts)	Social (networks and collaboration among actors)	Anchor Organizations
There are dozens of co-working spaces, incubation services, and start-up support for small businesses. A large amount of Utah is rural and these assets are less common in rural areas. **Innovation District - Hill AFB/Falcon Hill**: Hill Air Force Base (AFB) is a major U.S. Air Force base about 30 miles north of Salt Lake City. Hill AFB is the home of the Air Force Materiel Command's (AFMC) Ogden Air Logistics Complex (OOALC) which is the worldwide manager for a wide range of aircraft, engines, missiles, software, avionics, and accessories components. The Falcon Hill Aerospace Research Park development next to Hill AFB represents a significant component of this innovation district. **Innovation Hub – MARS Center:** The Miller Advanced Research and Solutions (MARS) Center at Weber State University launched in 2022 to bring various stakeholders together. Weber State University, 47G, other state and community partners, federal partners, and industry partners sponsored MARS to address production deficiencies in high-temperature materials deployment and the need to further develop hypersonic capabilities. **Innovation Hub - Space Dynamics Laboratory**: As a U.S. Missile Defense Agency-sponsored University Affiliated Research Center (affiliated with USU), Space Dynamics Laboratory has a rich heritage of providing air, space, ground, and cyber solutions to NASA and the Department of Defense. Capabilities include small satellite technologies, advanced spaceborne sensors and instruments, command and control, ground systems, and mission data processing. **Innovation Hub - 47G UAMMI Institute**: 47G works to build a significant ecosystem for aerospace, defense, and cyber companies. Bringing together academic institutions, service providers, government, and community partners, they foster talent, fund entrepreneurship, and fuel innovation in Utah. The Utah Advanced Materials and Manufacturing Initiative (UAMMI) Institute within 47G is a federal and state funded initiative that acts as a potential innovation hub to bring together public, private, community, industry and education partners to assure growth and sustainability of Utah's advanced material and manufacturing industry.	There are many organizations in Utah dedicated to the advancement of innovation within this ecosystem. A few examples include: • 47G • Aerospace States Association • Mountain West Chapter of AUVSI • Rapid Integration & Acceptance Center • Utah Airport Operators Association • Utah Back Country Pilots Association • Utah Business Aviation Association • Utah Chapter of SAMPE • Utah General Aviation Association • Utah Manufacturing Extension Partnership Led by the University of Utah, the Utah Network for Integrated COmputing and Semiconductor research and education (UNICOS) brings together stakeholders in the Utah semiconductor industry to provide workforce training and research to create a highly skilled workforce and generate innovation. Collaborative partners include public and private universities and colleges, as well as industrial partners such as Texas Instruments.	**Private Companies** Utah has new and legacy companies anchoring the ecosystem. A few examples include: • Albany Aerostructures Composites • BAE Systems • Boeing • Duncan Aviation • Hexcel • JBT Aerotech • L3 Harris • Lockheed Martin • Moog • Northrop Grumman • Parker Hannifin • Petersen • TTM Technologies • Williams International **Educational Institutions** There are many anchor educational institutions, including: • Davis Tech • Ogden-Weber Tech • Salt Lake Community College Aerospace • University of Utah Aerospace Engineering • Utah Valley University College of Aviation • Utah State University

Table 4-12: Infrastructure: Energy Production Innovation Ecosystem

Physical (Incubation/lab space, research facilities, innovation hubs and districts)	Social (networks and collaboration among actors)	Anchor Organizations
While there are dozens of co-working spaces, incubation services, and start-up support for small businesses in Utah, there is not a significant amount of infrastructure and manufacturing space available for energy production companies. **Innovation Hub - The San Rafael Energy Research Center**: This center provides space, equipment, and staff to support energy research. **Innovation Hub - Energy Future Hubs at the University of Utah**: This hub is a major collaboration among higher education and industry and addresses the climate crisis by identifying the solution for reliable and cost-efficient energy in Utah. The center includes many institutions across interdisciplinary fields and provides research funding opportunities on energy issues. The University of Utah leads other energy initiatives as a model across Utah and Western Regions.[81] **Innovation Hub - ASPIRE at Utah State University:** Utah State University's Advancing Sustainability through Powered Infrastructure for Roadway Electrification (ASPIRE) research center focuses on advancing electric vehicle (EV) technologies and sustainable transportation. Funded by the National Science Foundation as an official Generation 4 Engineering Research Center, it develops innovative solutions like wireless charging, enhanced battery technologies, and smart mobility applications. By collaborating with industry, government, and academia, ASPIRE aims to make electric transportation more efficient and accessible, supporting broader environmental goals and positioning Utah as a leader in transportation research. **Innovation Hub - Bingham research center at Utah State University**: The research center is dedicated to energy and environmental research in Utah and around the world. The key research includes Uinta Basin air quality, emission measurement, and oil and gas-related impacts to air quality. The center collaborates with academic, government, and industry partners to conduct research on air pollution sources, greenhouse gas emissions, and mitigation strategies. It also provides fellowship opportunities for students to conduct environmental research with scientists at the research center. **Innovation Hub - The Energy Transition Research Initiative (eTRI) at Utah State University:** The initiative is a collaborative program among experts from academia, industry, and government to conduct research and develop innovative solutions for reducing carbon emissions and enhancing energy efficiency. eTRI's work often focuses on renewable energy integration, advanced energy storage technologies, grid modernization, and policy development to support clean energy adoption.	There are many organizations in Utah dedicated to the advancement of innovation within this ecosystem. A few examples include: • Utah Clean Energy • Interwest Energy Alliance • Utah Association of Energy Users (UAE) • Utah Petroleum Association (UPA) • Utah Association of Energy Engineers (AEE)	**Private Companies** Utah has new and legacy companies anchoring the ecosystem. A few examples include: • Rocky Mountain Power • Dominion Energy • Intermountain Power Service Corp • AES Clean Energy Services • Lumio • Blue Raven Solar • Vivint Solar • Intermountain Wind and Solar • rPlus Energies • Empire Solar Group **Educational Institutions** There are many anchor educational institutions, including: • University of Utah • Brigham Young University • Utah Valley University • Utah State University • Weber State University • Westminster University • Southern Utah University • Utah Tech University

Table 4-13: Infrastructure: Finance, Fintech, and Headquarters Innovation Ecosystem

Physical (Incubation/lab space, research facilities, innovation hubs and districts)	Social (networks and collaboration among actors)	Anchor Organizations
There are dozens of co-working spaces, incubation services, and start-up support for small businesses. A large amount of Utah is rural and these assets are less common in rural areas. While there are a few places dedicated to financial innovation and startups, there are few that specialize in financial services. **Innovation hub - Stena Center for Financial Technology at the University of Utah**: The Stena Center for Financial Technology at the University of Utah, supported by Stena Group, acts as an innovation hub by focusing on advancing financial technology through education, research, and industry collaboration. It offers students hands-on learning and connects them with industry experts.	There are many organizations in Utah dedicated to the advancement of innovation within this ecosystem. A few examples include: • Association for Corporate Growth–Utah Chapter • The Financial Planning Association of Utah • The Utah Bankers Association • Utah Association of Financial Services	**Private Companies** Utah has new and legacy companies anchoring the ecosystem. A few examples include: • Acima Credit • American Express • Deloitte & Touche • Discover Products • Divvy (Bill.com) • Ernst & Young • E-Trade • Fidelity Investments • Global Payments • Goldman Sachs • JP Morgan Chase Bank • KeyBank • KPMG • LendingClub • Merrill Lynch • Morgan Stanley • MX • Pricewaterhouse-Coopers • SelectHealth • Sutter Connect • Wells Fargo Bank • Zions Bancorporation **Educational Institutions** The anchor educational institutions include: • Brigham Young University • University of Utah

Table 4-14: Infrastructure: Health Care and Life Sciences Innovation Ecosystem

Physical (Incubation/lab space, research facilities, innovation hubs and districts)	Social (networks and collaboration among actors)	Anchor Organizations
While there are dozens of co-working spaces, incubation services, and start-up support for small businesses in Utah, there is not a significant amount of lab space available for life sciences companies. **Innovation District - University of Utah Research Park**: The University of Utah Research Park is the most mature and renowned innovation district in Utah. Research, technology development, and business innovation affiliated with the University of Utah integrate to foster university-industry collaboration and support the larger innovation ecosystem. **Innovation District - Depot District:** The Depot District in Salt Lake City has evolved from a historical railroad hub into a dynamic center of urban renewal and economic activity. The area hosts an array of businesses including biotech startups and medical research facilities. **Innovation Hub - Utah Nanofab:** Utah Nanofab at the University of Utah is a leading facility for nanotechnology research, providing advanced tools for the development of micro and nanoscale devices. It supports both academic and commercial projects, enhancing innovations in electronics, photonics, and biotechnology. This facility is pivotal in transforming theoretical research into practical applications, thereby boosting both technological advancement and economic development in the region. **Innovation Hub - Altitude Lab:** Altitude Lab is an incubator focused on accelerating health sciences innovation. Located in Salt Lake City, Utah, it offers startups lab space, mentorship, and industry connections. Specializing in biotechnology and medical innovations, Altitude Lab enhances Utah's life sciences ecosystem by helping transform new ideas into practical health care solutions. **University of Utah Center for Medical Innovation:** The University of Utah Center for Medical Innovation (CMI) is a multidisciplinary hub that fosters innovation in health care and medical technology. It brings together students, faculty, staff, and the local entrepreneurial community to develop cutting-edge solutions for medical challenges. It offers resources like prototyping facilities, mentorship programs, and funding opportunities to support the entire innovation lifecycle—from idea conception to commercialization. Key initiatives include the Bench-to-Bedside program, which encourages student teams to create and present medical device prototypes, and Med Tech Venture Studio, which allows inventors and industry experts to work together to build technologically innovative, market-ready devices. **Innovation Hub - BioMADE**: BioMADE's mission is to enable domestic bioindustrial manufacturing at all scales, develop technologies to enhance U.S. bioindustrial competitiveness, de-risk investment in relevant infrastructure, and expand the biomanufacturing workforce to realize the economic promise of industrial biotechnology.	There are many organizations in Utah dedicated to the advancement of innovation within this ecosystem. A few examples include: • BioUtah • BioHive • BioInnovations Gateway	**Private Companies** Utah has new and legacy companies anchoring the ecosystem. A few examples include: • ARUP Laboratories • BD (Becton Dickinson) • BioMerieux • Biomerics • Blackrock • Neurotech • Cytiva • Deseret Laboratories • Edwards Lifesciences • Fresenius USA Manufacturing • GE Healthcare • ICU Medical • Laborie Medical Technologies • Merit Medical Systems • Moog Medical Devices Group • Moxtek • Myriad Genetic Laboratories • Nelson Laboratories • Ortho Development • Otto Bock Healthcare • PolarityTE • Pra Health Sciences • RB Health Manufacturing • Recursion Pharmaceuticals • Sorenson Genomics • Stryker • Thermo Fisher Scientific • Ultradent Products • Varex Imaging **Educational Institutions** There are many anchor educational institutions, including: • University of Utah • Brigham Young University • Utah Valley University • Utah State University • Weber State University • Westminster University • Southern Utah University • Utah Tech University

Table 4-15: Infrastructure: Technology and Information Systems Innovation Ecosystem

Physical (Incubation/lab space, research facilities, innovation hubs and districts)	Social (networks and collaboration among actors)	Anchor Organizations
There are dozens of co-working spaces, incubation services, and start-up support for small businesses. A large amount of Utah is rural and these assets are less common in rural areas. **Innovation District - Silicon Slopes**: Utah is known for its tech companies' concentration and its potential innovation district known as "Silicon Slopes." Here, industry leaders, investors, government officials, and higher education administrators collaborate to focus on empowering entrepreneurs to build and innovate, especially in the technology sector. **Innovation Hub - Tech Ridge**: Located in St. George, Utah. Tech Ridge is a 180-acre mixed-use development that attracts tech companies. There is a mix of workspaces, shops, and eateries, plus 60 acres of accessible trails, parks, and open space surrounded by the red cliffs of Southern Utah. **Innovation Hub - RevRoad**: RevRoad is a venture capital and incubation services company that offers capital and help with marketing, sales, legal, finance, and other needed resources to run a small business.	There are many organizations in Utah dedicated to the advancement of innovation within this ecosystem. A few examples include: • Silicon Slopes • Women Tech Council • Tech Moms	**Private Companies** Utah has new and legacy companies anchoring the ecosystem. A few examples include: • Adobe • Ancestry • BambooHR • Domo • eBay • Entrata • NICE CXone • Instructure • Lucid Software • MasterControl • Meta • Overstock • Pluralsight • Podium • Qualtrics • Texas Instruments • Xactware **Educational Institutions** There are many anchor educational institutions, including: • Brigham Young University • Utah Valley University • Neumont College of Computer Science • University of Utah • Utah State University • Weber State University • Westminster University • Southern Utah University • Utah Tech University

SURROUNDING CHARACTERISTICS DATA ANALYSIS SUMMARY

Table 4-16: Surrounding Characteristics: Aeronautics/Space Exploration/Defense Innovation Ecosystem

Culture of Innovation	Economy	Quality of Life
Utah has a legacy in aerospace with significant companies, organizations, industry associations, and educational assets all coming together to advance the ecosystem in the state.[82]	5-Year GDP: 47.2% Total Employment: 33,632 5-Year Industry Specific Job Growth: 23% 1-Year Projected Industry Growth: 1.5%[83] **Note**: all numbers cited in this section are based on combined NAICS codes using GOEO's industry definition. This definition may or may not align with other industry definitions, such as those of DWS, Gardner Institute, etc. See Table 2-1 for additional details.	Utah has a strong quality of life with significant outdoor assets such as 46 state parks and 5 national parks. Utah experiences four distinct seasons, enjoys 15 ski resorts and more than 1,000 fishable lakes. Utah has professional sports teams in the NBA (Utah Jazz), NHL (Utah Hockey Club), and MLS (Real Salt Lake). Utah is home to the Sundance Film Festival, a full-time symphony, and a host of arts and entertainment activities and events. Utah has iconic landscapes that have been featured in major motion pictures such as: Indiana Jones and the Last Crusade, Forrest Gump, Independence Day, and a host of others. Utah ranks 1st among U.S. states in volunteerism[84], 1st in overall place to live,[85] and 4th in safety.[86] Salt Lake City ranks as the 4th most generous city[87] and the 4th best performing city.[88]

Table 4-17: Surrounding Characteristics: Energy Production Innovation Ecosystem

Culture of Innovation	Economy	Quality of Life
Utah has a legacy in energy production, beginning with coal and other nonrenewable fuels, and has made many leaps to more modern, sustainable energy, with significant companies, organizations, industry associations, and educational assets all coming together to advance the ecosystem in the state.[82]	5-Year GDP: 47.2% Total Employment: 59,516 5-Year Industry Specific Job Growth: 20.1% 1-Year Projected Industry Growth: 1.4%[83] **Note**: all numbers cited in this section are based on combined NAICS codes using the U.S. Department of Energy industry definition, minus motor vehicles. This definition may or may not align with other industry definitions, such as those of DWS, Gardner Institute, etc. See Table 2-1 for additional details.	Utah has a strong quality of life with significant outdoor assets such as 46 state parks and 5 national parks. Utah experiences four distinct seasons, enjoys 15 ski resorts and more than 1,000 fishable lakes. Utah has professional sports teams in the NBA (Utah Jazz), NHL (Utah Hockey Club), and MLS (Real Salt Lake). Utah is home to the Sundance Film Festival, a full-time symphony, and a host of arts and entertainment activities and events. Utah has iconic landscapes that have been featured in major motion pictures such as: Indiana Jones and the Last Crusade, Forrest Gump, Independence Day, and a host of others. Utah ranks 1st among U.S. states in volunteerism[84], 1st in overall place to live,[85] and 4th in safety.[86] Salt Lake City ranks as the 4th most generous city[87] and the 4th best performing city.[88]

Table 4-18: Surrounding Characteristics: Finance, Fintech, and Headquarters Innovation Ecosystem

Culture of Innovation	Economy	Quality of Life
Utah has a legacy in finance and technology with significant companies, organizations, industry associations, and educational assets all coming together to advance the ecosystem in the state.[82]	5-Year GDP: 47.2% Total Employment: 101,616 5-Year Industry Specific Job Growth: 14.6% 1-Year Projected Industry Growth: 1.3%[83] **Note**: all numbers cited in this section are based on combined NAICS codes using GOEO's industry definition. This definition may or may not align with other industry definitions, such as those of DWS, Gardner Institute, etc. See Table 2-1 for additional details.	Utah has a strong quality of life with significant outdoor assets such as 46 state parks and 5 national parks. Utah experiences four distinct seasons, enjoys 15 ski resorts and more than 1,000 fishable lakes. Utah has professional sports teams in the NBA (Utah Jazz), NHL (Utah Hockey Club), and MLS (Real Salt Lake). Utah is home to the Sundance Film Festival, a full-time symphony, and a host of arts and entertainment activities and events. Utah has iconic landscapes that have been featured in major motion pictures such as: Indiana Jones and the Last Crusade, Forrest Gump, Independence Day, and a host of others. Utah ranks 1st among U.S. states in volunteerism[84], 1st in overall place to live,[85] and 4th in safety.[86] Salt Lake City ranks as the 4th most generous city[87] and the 4th best performing city.[88]

Table 4-19: Surrounding Characteristics: Health Care and Life Sciences Innovation Ecosystem

Culture of Innovation	Economy	Quality of Life
Utah has a legacy in life sciences with significant companies, organizations, industry associations, and educational assets all coming together to advance the ecosystem in the state.[82]	5-Year GDP: 47.2% Total Employment: 48,165 5-Year Industry Specific Job Growth: 27% 1-Year Projected Industry Growth: 1.3%[83] **Note**: all numbers cited in this section are based on combined NAICS codes using GOEO's industry definition. This definition may or may not align with other industry definitions, such as those of DWS, Gardner Institute, etc. See Table 2-1 for additional details.	Utah has a strong quality of life with significant outdoor assets such as 46 state parks and 5 national parks. Utah experiences four distinct seasons, enjoys 15 ski resorts and more than 1,000 fishable lakes. Utah has professional sports teams in the NBA (Utah Jazz), NHL (Utah Hockey Club), and MLS (Real Salt Lake). Utah is home to the Sundance Film Festival, a full-time symphony, and a host of arts and entertainment activities and events. Utah has iconic landscapes that have been featured in major motion pictures such as: Indiana Jones and the Last Crusade, Forrest Gump, Independence Day, and a host of others. Utah ranks 1st among U.S. states in volunteerism[84], 1st in overall place to live,[85] and 4th in safety.[86] Salt Lake City ranks as the 4th most generous city[87] and the 4th best performing city.[88]

Table 4-20: Surrounding Characteristics: Technology and Information Systems Innovation Ecosystem

Culture of Innovation	Economy	Quality of Life
Utah has a legacy in technology with significant companies, organizations, industry associations, and educational assets all coming together to advance the ecosystem in the state.[82]	5-Year GDP: 47.2% Total Employment: 86,713 5-Year Industry Specific Job Growth: 19% 1-Year Projected Industry Growth: 2.5%[83] **Note**: all numbers cited in this section are based on combined NAICS codes using GOEO's industry definition. This definition may or may not align with other industry definitions, such as those of DWS, Gardner Institute, etc. See Table 2-1 for additional details.	Utah has a strong quality of life with significant outdoor assets such as 46 state parks and 5 national parks. Utah experiences four distinct seasons, enjoys 15 ski resorts and more than 1,000 fishable lakes. Utah has professional sports teams in the NBA (Utah Jazz), NHL (Utah Hockey Club), and MLS (Real Salt Lake). Utah is home to the Sundance Film Festival, a full-time symphony, and a host of arts and entertainment activities and events. Utah has iconic landscapes that have been featured in major motion pictures such as: Indiana Jones and the Last Crusade, Forrest Gump, Independence Day, and a host of others. Utah ranks 1st among U.S. states in volunteerism[84], 1st in overall place to live,[85] and 4th in safety.[86] Salt Lake City ranks as the 4th most generous city[87] and the 4th best performing city.[88]

Endnotes

1. The Indiana Business Research Center at Indiana University's Kelly School of Business maintains StatsAmerica and produces the Innovation Intelligence Index to show the regional characteristics of innovation and entrepreneurship to help economic development strategies. The headline Innovation Intelligence Index is calculated from five equally-weighted core indexes: Human Capital and Knowledge Creation, Business Dynamic, Business Profile, Employment and Productivity, and Economic Well-Being. The index can be retrieved from https://www.statsamerica.org/innovation.
2. Katz, B., & Wagner, J. (2014). The Rise of Innovation Districts: A New Geography of Innovation in America. Metropolitan Policy Program, The Brookings Institute.
3 Granstrand, O., & Holgersson, M. (2020). Innovation ecosystems: A conceptual review and a new definition. *Technovation, 90*, 102098.
4. The Innovation Intelligence Index consolidates a wide range of county, metro area, and state-level data and metrics related to innovation activities and potential. Those core indexes are constructed from several sub-indexes, organized thematically around precisely defined concepts.
5. According to the 2023 Human Capital and Knowledge Creation Index in the Innovation Intelligence Index.
6. U.S. News & World Report (2024). Undergraduate Business Program Rankings. Retrieved from https://www.usnews.com/best-colleges/rankings#business-overall.
7. Ibid.
8. By Utah's legislature and former Governor Michael Leavitt
9. Kem C. Gardner Policy Institute. (2024). Utah's Engineering and Computer Science Initiative. *Economic Development Case Study*, April.
10. Clark, J.H. (2024). Engine Opportunity: How eds and meds institutions can become more powerful drivers of prosperity in America's cities. *Blueprint for Opportunity Series No. 4*, The George W. Bush Institute.
11. The Carnegie Classification of Institutions of Higher Education is a well-recognized three-tiered (R1, R2, and R3) classification system used to assess research activities at U.S. higher education institutions. R1 institutions are doctoral universities engaged in the highest level of research activity. Based on the updated 2025 criteria for The Carnegie Classification of Institutions of Higher Education, BYU will qualify soon as an R1 university as well.
12. National Science Foundation. (2024). Rankings by R&D expenditures. , Retrieved from https://ncsesdata.nsf.gov/profiles/site?method=rankingBySource&ds=herd
13. Kem C. Gardner Policy Institute. (2024). Utah's Research Universities: Definition, Benefits, and Reach. Retrieved from https://d36oiwf74r1rap.cloudfront.net/wp-content/uploads/2024/06/Insights-Research-Jun2024.pdf
14. Clark, J.H. (2024). Engine Opportunity: How eds and meds institutions can become more powerful drivers of prosperity in America's cities. *Blueprint for Opportunity Series No. 4*, The George W. Bush Institute.
15. Metrics for university and research institution innovation impact include patents; intellectual property licenses; IP license income; citations of papers; number of bachelor's, master's degree, and Ph.D. graduates in STEM; research spending; faculty quality; technology transfer office staff; patenting budget; and entrepreneurship programs. Please see Clark (2024) for more detail.
16. Innovation impact productivity is calculated by dividing the overall innovation impact score for each institution by that institution's total research spending, then multiplying by 10^8 to arrive at scores with a more intuitive scale. Please see Clark (2024) for more detail.
17. Strebulaev, I. (2022). Venture Capital Initiative, Standford Graduate School of Business.
18. National Science Foundation. (2024). Science and Technology in Economy Indicators. Retrieved from https://ncses.nsf.gov/indicators/states/indicators
19. See https://taxfoundation.org/research/all/state/2024-state-business-tax-climate-index/ and https://incometax.utah.gov/paying/tax-rates
20. EDCUtah Site Selector research. (2023). Over 600 national site selectors respond to this annual survey.
21. Utah Governor's Office of Economic Opportunity (2024). Business Recruitment and Expansion. Retrieved from https://business.utah.gov/business-recruitment/
22. Community Development Entities (CDEs): https://www.cdfifund.gov/programs-training/programs/new-markets-tax-credit
23. See https://energy.utah.gov/homepage/tax-credits/hcitc/ for additional details related to Utah's High-Cost Infrastructure Tax Credit.
24. Clark, J.H. (2024). Engine Opportunity: How eds and meds institutions can become more powerful drivers of prosperity in America's cities. *Blueprint for Opportunity Series No. 4*, The George W. Bush Institute.
25. https://www.statsamerica.org/sip/rank_list.aspx?rank_label=pi_9&ct=S49
26. Utah Economic Council. (2024). Utah Economic Council Forecast for Selected Economics and Business Indicators, 2024 and 2025, June 2024. Retrieved from https://d36oiwf74r1rap.cloudfront.net/wp-content/uploads/2024/06/UEC-Forecast-Jun2024.pdf
27. Utah performed particularly well in three measures of economic well-being: 10-year per capita personal income growth (ranked 1st), the government transfers to total personal income ratio (ranked 2nd), and average unemployment rate (ranked 8th). Utah's per capita personal income 10-year change was at 33% in 2023, ranking 1st among all states. The state demonstrated the second-lowest dependence on government transfer, indicating a sufficient workforce to support the dependent population.
28. Utah ranks 8th among U.S. states for median sales price of existing single-family homes as of 2024Q1, according to the National Association of Realtors.
29. At the September 2024 Unified Economic Opportunity Commission (UEOC) meeting, Utah's Governor Spencer Cox announced his administration's goal to double Utah's energy output by 2034. See here for additional details: https://governor.utah.gov/press/news-release-gov-cox-unveils-operation-gigawatt/.
30. FERVO Energy is advancing geothermal energy in Utah through its Cape Station Project in Beaver County, northeast of Milford. This geothermal facility aims to deliver carbon-free electricity, with a potential to generate up to 2 gigawatts. See here for additional details: https://fervoenergy.com/fervo-energy-breaks-ground-on-the-worlds-largest-next-gen-geothermal-project/.
31. Advanced Clean Energy Storage Delta (ACES Delta) is developing scalable renewable energy and storage in Milford County. They leverage unique natural resources in the area such as underground salt dome caverns for energy storage. For more detail, please see https://aces-delta.com/.
32. Lloyd, N. & Spendlove, R. (2024). Banking and Financial Services. Kem C. Gardner Policy Institute. Retrieved from https://d36oiwf74r1rap.cloudfront.net/wp-content/uploads/2024/03/ERG2024-Banking-RB-March2024.pdf
33. *Ibid*.
34 https://www.statsamerica.org/innovation2/
35 List, F. (1841). The National System of Political Economy, London, Longmans, Green & Co., 1885, reprinted by Fairfield August M.
36 Viitanen, J. (2016). Profiling regional innovation ecosystems as functional collaborative systems: The case of Cambridge. Technology Innovation Management Review, 6(12).
37 Guzman, J., Murray, F., Stern, S., & Williams, H. L. (2023). Accelerating Innovation Ecosystems: The Promise and Challenges of Regional Innovation Engines (No. w31541). National Bureau of Economic Research.
38 Utah System of Higher Education. (2023). Presentation. USHE Global Innovation District Research.
39 https://startupgenome.com/ecosystems/detroit
40 https://startupgenome.com/ecosystems/philadelphia
41 https://startupgenome.com/ecosystems/pittsburgh
42 https://startupgenome.com/ecosystems/san-diego
43. The Nations' Report Card. (2024). State Profiles, Utah State Comparisons. Retrieved from https://www.nationsreportcard.gov/profiles/stateprofile/overview/UT?sfj=NP&chort= 1&sub=MAT&sj=UT&st=MN&year=2022R3&cti=PgTab_ ScoreComparisons

44. URPP prepares high school students for STEM careers in rotary-wing aviation. The program fosters connections between rotorcraft industry professionals and high schools, flight schools, and universities, offering benefits such as mentoring, internships, and job interviews. Please see: https://utahrotor.org/ for more detail.
45. https://www.afrotc.com/
46. Utah System of Higher Education. (2024). Degree completions in Cyber/Computer Forensic and Counterterrorism and Cybersecurity Defense Strategy/Policy, Retrieved from https://ushe.edu/institutional-data-resources-degrees-awards/
47. Beaudry, C. (2001). Entry, growth and patenting in industrial clusters: A study of the aerospace industry in the UK. *International Journal of the Economics of Business, 8*(3), 405-436.
48. National Science Foundation. (2024). Ranking by total R&D expenditures. Retrieved from https://ncsesdata.nsf.gov/profiles/site?method=rankingBySource&ds=herd
49. University of Utah Technology Licensing Office. (2024). Annual Report 2023. Retrieved from https://technologylicensing.utah.edu/news-events/annual-reports/12-2023-annual-report/file
50. Utah State University Office of Research. (2024). Annual Report FY 2023. Retrieved from https://research.usu.edu/annual-report
51. https://energy.utah.gov/homepage/education/curriculum/
52. https://epic.utah.edu/energy-workforce-training-partnership-program/#
53. https://engineering.usu.edu/mae/faculty/hailei-wang/publications
54. University of Utah Technology Licensing Office. (2024). Annual Report 2023. Retrieved from https://technologylicensing.utah.edu/news-events/annual-reports/12-2023-annual-report/file
55. Utah State University Office of Research. (2024). Annual Report FY 2023. Retrieved from https://research.usu.edu/annual-report
56. https://www.thenationsreportcard.org/
57. Deloitte. (2023). A Financial Services Industry Perspective: New fundamentals for a boundaryless world. Retrieved from https://www2.deloitte.com/us/en/pages/financial-services/articles/human-capital-trends-financial-services-industry.html
58. https://jobs.utah.gov/wi/update/empind/
59. JobsEQ. Occupation Distribution for Financial Services in Utah, 2023Q4
60. https://stena.utah.edu/ucfs/
61. University of Utah Technology Licensing Office. (2024). Annual Report 2023. Retrieved from https://technologylicensing.utah.edu/news-events/annual-reports/12-2023-annual-report/file
62. Utah State University Office of Research. (2024). Annual Report FY 2023. Retrieved from https://research.usu.edu/annual-report
63. Pace, L. & Brandley, A. (2023). Economic Impacts of Utah's Life Sciences and Health Care Innovation Industry, Kem C. Gardner Policy Institute, Retrieved from https://d36oiwf74r1rap.cloudfront.net/wp-content/uploads/2024/01/LifeSciences-Nov2023.pdf
64. https://www.biohive.com/student-chapters-utah/
65. Pace, L. & Brandley, A. (2023). Economic Impacts of Utah's Life Sciences and Health Care Innovation Industry, Kem C. Gardner Policy Institute, Retrieved from https://d36oiwf74r1rap.cloudfront.net/wp-content/uploads/2024/01/LifeSciences-Nov2023.pdf
66. University of Utah Technology Licensing Office. (2024). Annual Report 2023. Retrieved from https://technologylicensing.utah.edu/news-events/annual-reports/12-2023-annual-report/file
67. Utah State University Office of Research. (2024). Annual Report FY 2023. Retrieved from https://research.usu.edu/annual-report
68. *Ibid*.
69. https://ushe.edu/engineering-and-computer-science-initiative/
70. Pace, L., Spolsdoff, J. & Becker, M. (2022). Utah's Engineering and Computer Science Workforce: Higher Education and Economic Trends, Kem C. Gardner Policy Institute. Retrieved from https://d36oiwf74r1rap.cloudfront.net/wp-content/uploads/ECS-Report-Oct2022.pdf
71. https://www.usnews.com/best-graduate-schools/top-science-schools/computer-science-rankings?name=university%20of%20utah&_sort=rank-asc
72. University of Utah Professional Education with edX provides online coding, data analytics, cybersecurity, UX/UI, digital marketing, AI, and machine learning courses. Utah State University with Fullstack Academy also provide bootcamps for coding, cyber, data analytics, DevOps, and Product management. Weber State University provides computer science camps for beginners (9-12) focusing on video game development. Utah Valley University offers career training in software engineering, data science and analytics, and cyber security. Utah Tech offers after-school programs in STEM and coding for all ages and skill levels. Southern Utah University offers professional and workforce development in computer technology such as Amazon Web Services (AWS) Foundation certificate, Defensive Security, and Network and Cloud Security.
73. https://www.usu.edu/cs/research/funding
74. University of Utah Technology Licensing Office. (2024). Annual Report 2023. Retrieved from https://technologylicensing.utah.edu/news-events/annual-reports/12-2023-annual-report/file
75. Utah State University Office of Research. (2024). Annual Report FY 2023. Retrieved from https://research.usu.edu/annual-report
76. EDCUtah Site Selector research
77. *Ibid.*
78. *Ibid.*
79. *Ibid.*
80. *Ibid.*
81. https://www.research.utah.edu/wp-content/uploads/sites/44/formidable/14/IIJA-Strategy-ES_2024April10_FINAL.pdf
82. This insight is largely derived from qualitative learnings from in-depth interviews of industry experts and local leaders and is in no way comprehensive.
83. Bureau of Labor Statistics Data accessed via JobsEQ
84. AmeriCorps. (2024). Volunteering and Civic Life in America. Retrieved from https://americorps.gov/about/our-impact/volunteering-civic-life/ut
85. World Population Review. (2024). Overall Best - US News 2024. Retrieved from https://worldpopulationreview.com/state-rankings/best-states-to-live-in
86. McCann, A. (2023). Safest States in America. WalletHub. Retrieved from https://wallethub.com/edu/safest-states-to-live-in/4566
87. Bernardo, R. (2021). 2022's Most Generous Cities. Retrieved from https://www.lawnstarter.com/blog/studies/most-generous-cities/
88. Switek, M., Mansell, L. & Smith, B. (2024). Best Performing Cities 2024: Focus on Sustainable Growth and Resilience. Milken Institute. Retrieved from https://milkeninstitute.org/sites/default/files/2024-02/BestPerformingCities2024.pdf

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