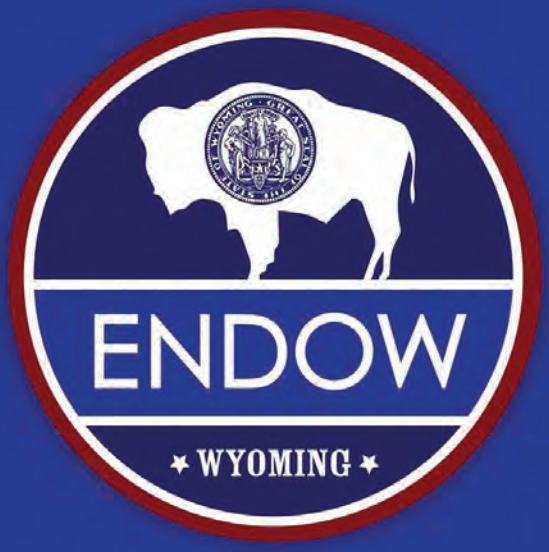
ENDOW

WYOMING

Appendix

August 30, 2017



Appendix 1:
Assessment of Economy by Industrial Sectors

APPENDIX

Appendix 1: Assessment of Economy by Industrial Sectors

Methods

Industry sector profiles characterize industry trends, compare Wyoming to other states, provide workforce data, and identify barriers, enablers, opportunities, and potential business development and innovation zones for each of the following 13 industry sectors, based on two-digit North American Industry Classification System (NAICS) codes:

- Agriculture, Forestry, Fishing, Hunting (11)
- Mining, Quarrying, and Oil and Gas Extraction (21)
- Utilities (22)
- Construction (23)
- Manufacturing (31-33)
- Wholesale Trade (42)
- Retail Trade (44-45)
- Transportation/Warehousing (48-48)
- Information (51)
- Finance, Insurance and Real Estate (52-53)
- Professional and Business Services (54-56)
- Education and Health Care Services (61-62)
- Leisure and Hospitality (71-72)
- Other Services (81)
- Public Administration (92)

Profiles incorporate data and interpretation from various publicly available sources, industry experts, and the ENDOW Regional Assessment.

Data Sources

Industry Expert Input

Input from industry experts was employed to reflect the perspective of private industry in this report. The Wyoming Business Council's extensive network was leveraged to select initial experts, who were asked to disseminate a solicitation for input to others in their field. In addition, ENDOW council members provided input on sectors where they could offer expertise.

The ENDOW Regional Assessment

Local outreach and incorporation of local perspectives is an important part of ENDOW. The ENDOW Regional Assessment is part of a continuous local outreach effort, and provided opportunities for communities to suggest areas for Business Development and Innovation Zones, identify specific focus industries, and inventory infrastructure and amenities in their area and their perspectives on the following items:

Specific Area Suggestions

- This section is meant establish an awareness-level inventory of sites that communities have studied or proposed in anticipation of the ENDOW intiative. Characterization of these sites will be included in later reports.

Industry Focus

- Here, communities identified specific focus industries that they are working to develop in their areas.

Geographic Inventory

- A geographic inventory was collected in this section, including infrastructure and amenities.

The ENDOW Regional Assessment was rolled out to municipalities and counties and local economic development organizations were also informed of the effort. These entities were encouraged to collaborate with one another where beneficial, attend how-to webinars, and reach out for support from the Wyoming Business Council as they completed the Regional Assessment.

Twenty-five responses were received. Of those, many were collaborative, including 16 county-wide collaborations, and one multi-county response. Ninety-four municipalities were represented in the responses, plus ten Census Designated Places, and four unincorporated communities.

Data collected using the ENDOW Regional Assessment are comprehensive and detailed and will provide a valuable resource for understanding perspectives across the state as the ENDOW initiative progresses. In this report, key points from the Regional Assessment have been incorporated with other publicly available data to provide high-level overviews of focus industries, assets, and amenities. Further analyses will continue to employ this rich dataset along with additional outreach soliciting input from communities.

Publicly Available Data

Other publicly available data sources were used, including data collected by state and federal agencies, University of Wyoming, and other sources. All sources are cited where referenced.

Sector Components

Trends

Industry trends were compiled based on research of publicly available sources, input from industry experts, and from the *Focus Industries* section of the ENDOW Regional Assessment.

How does Wyoming compare with other states?

The following states were used as comparators, based on past and present geographic and/or economic similarities:

Alaska, Colorado, Idaho, Montana, New Mexico, North Dakota, South Dakota, and Utah.

Workforce

Publicly available data sources were used, including data collected by state and federal agencies, and are cited where referenced. Workforce data describing shortages and surpluses are not readily available for this report.

Barriers, Enablers and Opportunities

Barriers, enablers, and opportunities were identified based on expertise and experience within the Wyoming Business Council, as well as from industry experts.

Asset Maps – Potential Business Development and Innovation Zones

Lists of assets required for success in each sector were determined in collaboration with industry experts in each sector. GIS information for these assets was then gathered from various sources, including state and federal agency data, data gathered by the University of Wyoming, data from various state professional associations, and data gathered from communities using the ENDOW Regional Assessment.

Required assets were then mapped using ArcGIS, and overlain with each other. In sectors where coincidence of assets is important, intersections of the most crucial assets were mapped to show areas where necessary components for each sector are coincident with each other. For sectors where coincidence of mappable assets is less essential, asset maps are not combined.

These intersections, sites within these areas, areas characterized by one or more input assets (e.g. workforce), or intersections amongst sectors may be considered potential business development and innovation zones. More focused analyses will be presented in the report submitted to the Legislature and Governor before December 31st, 2017.

Layers and intersections shown in this report will be added to the web mapping platform *Natural Resource and Energy Explorer*, which was developed by the Wyoming Geographic Information Science Center. This platform is accessible to the public at NREX.wyo.gov.

Agriculture, Forestry, Fishing, Hunting (11)

Summary of Sector

What are the businesses in the sector

Crop production, animal production, forestry/logging, fishing/hunting/trapping (commercial only), support activities for agriculture and forestry

Compare to US and other states

Wyoming ranks above the US but ranks behind surrounding states such as Alaska, Colorado, Idaho, Montana, New Mexico, South Dakota and Utah for this industry. Activities contributed 1.5% to Wyoming's GDP in 2016 compared to 1% for the US. This gap provides $172.2 million to the State's GDP.

Workforce

Wages within this sector pay below the mean but above the median for all occupations. In Wyoming, wages are on the lower end compared to surrounding states.

Barriers and obstacles

Lack of skilled workforce and federal land use issues

Opportunities

Value added agriculture, agriculture technology

Emerging trends

- Transfer of assets to younger generation
- Data analysis will become increasingly important in farming and ranching operations
- US meat consumption continues to drop, but Chinese meat consumption is on the rise
- GMOs and treatment of livestock continue to be hot public opinion issues
- Lumber industry will continue to be largely controlled housing demand and trade, particularly with Canada
- Biomass conversion to energy is a viable form of alternative energy which uses the waste of logging operations

Trends

Industry Expert Input:

Trending sportsmen continue to view Wyoming favorable. Wyoming is seen as a great place to hunt and easy to get there. Our industry continues to enjoy relatively good conditions.

-Wyoming Outfitters & Guides Association

Shifting Farm Structure: A large transfer of farm assets to younger producers will occur soon. The average farmer is 57 years old, and 30% are over 65. A typical Midwest farm of 2,000 acres could conservatively be worth $10 million, just including land valued at $5,000 per acre. The trend toward larger farms will slow until it hits equilibrium.

Acceleration in Technology: Data analysis in the years ahead will supplement what farmers know intuitively—and in some cases challenge those assumptions. New products rely on aerial satellite imagery, greenness sensors, soil maps and millions of weather data points. The question of data ownership will be a subject of growing debate.

Biotechnology Strategy Evolves: GMOs are here to stay but face political and public relations hurdles. In states such as Vermont, where labels are required, implementation is expensive. Yet some GMO advocates back a federal labeling solution that would halt state efforts. The industry can benefit by helping turn public opinion.

Specialization to Continue: Agricultural production is becoming more specialized. In 1982, 35% of all farms produced corn, but in 2007 only 22% did because of economies of scale, technological advances and government policy. Today, farmers have diversified with organics, non-GMO products, high-oleic soybeans and high-starch corn.

Resource Scarcity: More than 40% of the food production increase since 1961 has been accomplished through irrigation, but groundwater supplies aren't infinite. Concerns have grown about the Ogallala Aquifer, which supplies 30% of U.S. irrigation groundwater. If trends continue, the aquifer will be 69% depleted, according to one study. Climate change also poses challenges. Scientists estimate that for each 1.8°F increase in temperature, key crop yields drop 10%.

Changing Commodity Environment: From 1980 to 2004, the correlation of corn prices to crude oil prices was 0.35. From 2005-13, that figure more than doubled to 0.87. Other commodities similarly illustrate the strong relationship between energy and crop prices. Future crop demand growth appears less bullish than in recent years because biofuels demand has "largely run its course." Although future demand for soybean exports will remain strong, China, which now buys two-thirds of all soybeans traded, has built its soybean stock levels from virtually zero to 17.4% of use. That will ease its import appetite.

Meat Consumption Shift: U.S. meat consumption declined 7.8% from 2007-13. Meanwhile, China has been the world's top meat consumer since 1992. By 2012, China's consumption more than doubled that of the U.S. By 2022, China's red meat and poultry consumption is projected to rise 15.2%. The U.S. likely will ship more pork and fewer feed grains to the country. That's because it is more cost-effective and efficient for China to import finished goods, a factor reflected in the Shuanghui International acquisition of Smithfield Foods. Regardless, U.S. grains and oilseeds will be needed by meat producers, as total world red meat and poultry demand is set to rise 15.1% from 2013-25.

Public Scrutiny of Livestock Treatment: Consumer demand and regulatory insistence on a range of safeguards for raising livestock in ways deemed sustainable and humane are causing rapid changes in the food system. Large food companies and supermarket chains are phasing out the use of sow farrowing crates from their supply chains. The change also has been forced by state legislation. Amid heightened consumer interest, transparency can be a powerful tool: Cargill, for instance, won over some skeptics in 2011 by taking reporter Lisa Ling on a tour of a slaughterhouse in Fort Morgan, Colo., as part of a segment for "The Oprah Winfrey Show."

Environmentalism Influence Grows: From fertilizer to pesticides, farmers have to be mindful of a complex, growing web of regulations. One of the fiercest battles is in the Chesapeake Bay watershed. A judge ruled in federal district court that an agreement between the Environmental Protection Agency and six states to implement a total maximum daily load (TMDL) of pollutants fits within the framework

of the Clean Water Act. Farm groups had sued to try and stop implementation of the 2011 agreement, and they warn that the ruling will have implications nationwide.

Government Policy in Flux: Successive administrations in the U.S. and other countries have established approaches to land use, biofuels, GMOs and monetary policy that seem likely to continue. The biggest change is likely to occur in China, which is slowly embracing GMOs. Chinese acceptance of GMOs for domestic crops would go a long way toward maintaining self-sufficiency and potentially turn the country into a net exporter.

Source: https://www.agweb.com/article/top-10-megatrends-in-agriculture-ed-clark/

Forestry

Demand: The U.S. demand for forest products is shaped by economic forces and evolving consumer tastes. On the economic side, low prices for wood relative to other materials have made wood an attractive material for home and building construction, paper and packaging materials, and as an industrial commodity. The United States, though, is no longer the world's lowest cost producer of wood or wood fiber products; competitiveness further complicated by a strong U.S. dollar has made U.S. products less competitive in world markets and has caused increased imports of wood products to satisfy consumer demands. Because of the abundance and diversity of wood types, consumers value wood in a variety of uses. In addition, wood is the basis for many products ranging from resins to the ubiquitous array of paper products.

Supply: Supply has been shaped by a changing array of forces influencing land use. In the past 200 years, these forces have included clearing land for agricultural uses while using the wood for products such as rails for fences and logs, and lumber for homes and barns. In the past 25 years, the development of empirically explicit timber supply relations has evolved to explain the collective behavior of timberland owners relative to economic conditions. Various state initiatives that have increased regulation of private timberlands have influenced the behavior of timberland owners over the past 20 years.

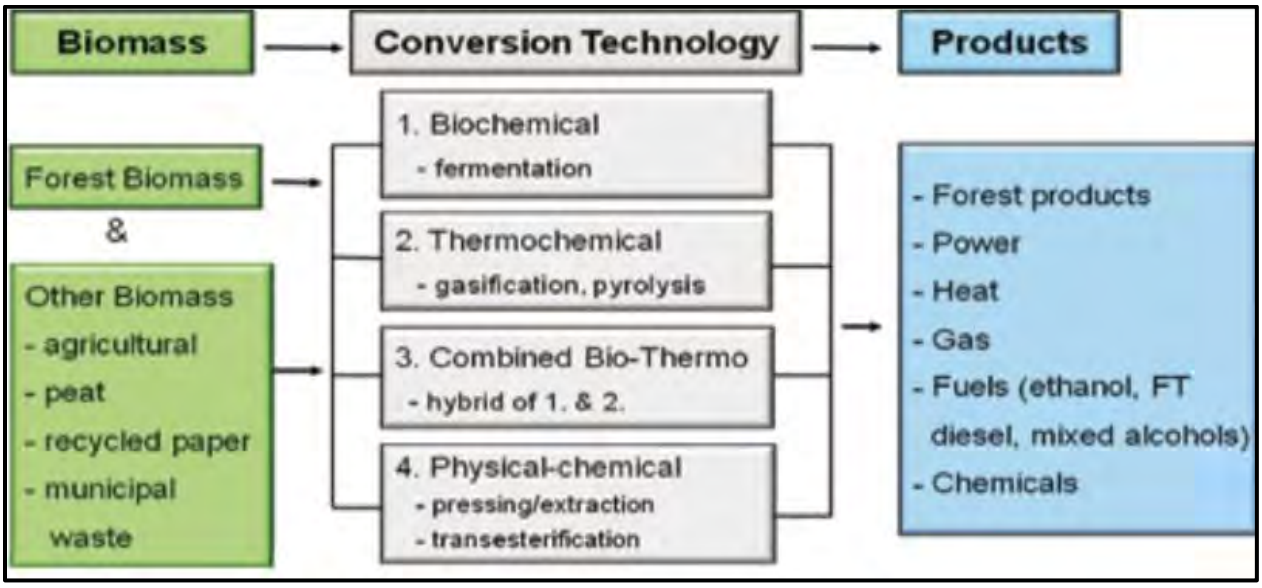
US/Canada Trade Dispute: The modern-day trade battle between the U.S. and Canada began in the early 1980s, and involves US duties levied on Canadian lumber imports. The heart of the dispute is the claim that the Canadian lumber industry is unfairly subsidized by federal and provincial governments, as most timber in Canada is owned by the provincial governments. The prices charged to harvest the timber are set administratively, rather than through the competitive marketplace, the norm in the United States. In the United States, softwood lumber lots are privately owned, and the owners form an effective political lobby. The United States claims that the Canadian arrangement constitutes an unfair subsidy, and is thus subject to U.S. trade remedy laws, where foreign trade benefiting from subsidies can be subject to a countervailing duty tariff, to offset the subsidy and bring the price of the commodity back up to market rates.

Other Trade Factors: From the potential trade, financial and immigration policy changes under the incoming Trump Administration to the unsettled softwood lumber trade negotiations, rising mortgage interest rates, new OSB capacity and mill restarts, and the strong dollar, to name a few, there is plenty to keep the wood markets unsettled. In this environment, traders are likely to maintain their conservative inventory buying strategies and producers are likely to plan conservatively and hope to be surprised on the upside.

Housing Market: Despite healthy demand, U.S. housing production has been held back by the supply-side constraints of labor and land availability. At this point, the show me mentality of traders with regard

to the housing markets has kept the consensus forecast at a mild 8% increase to 1.26 million units in 2017, according to forecasts compiled by the APA.

Biomass: Biomass is mainly obtained from organic matter such as leftover material from logging operations. It is further converted into a combustible gas mixture through the process of biomass gasification. The energy released through the process can be used for cooking food, generating electricity, heating and transportation. Biomass offers a viable alternative to coal-based power generation. Due to rising environmental concerns and increasing green-house gas emissions, companies are now turning towards environment-friendly energy sources. Consequently, the market for biomass has grown significantly faster than other energy sources. Moreover, government's support through various policies and regulations along with abundant availability of biomass are some of the other factors that are currently driving this market.



Sources:
http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.201.8498&rep=rep1&type=pdf

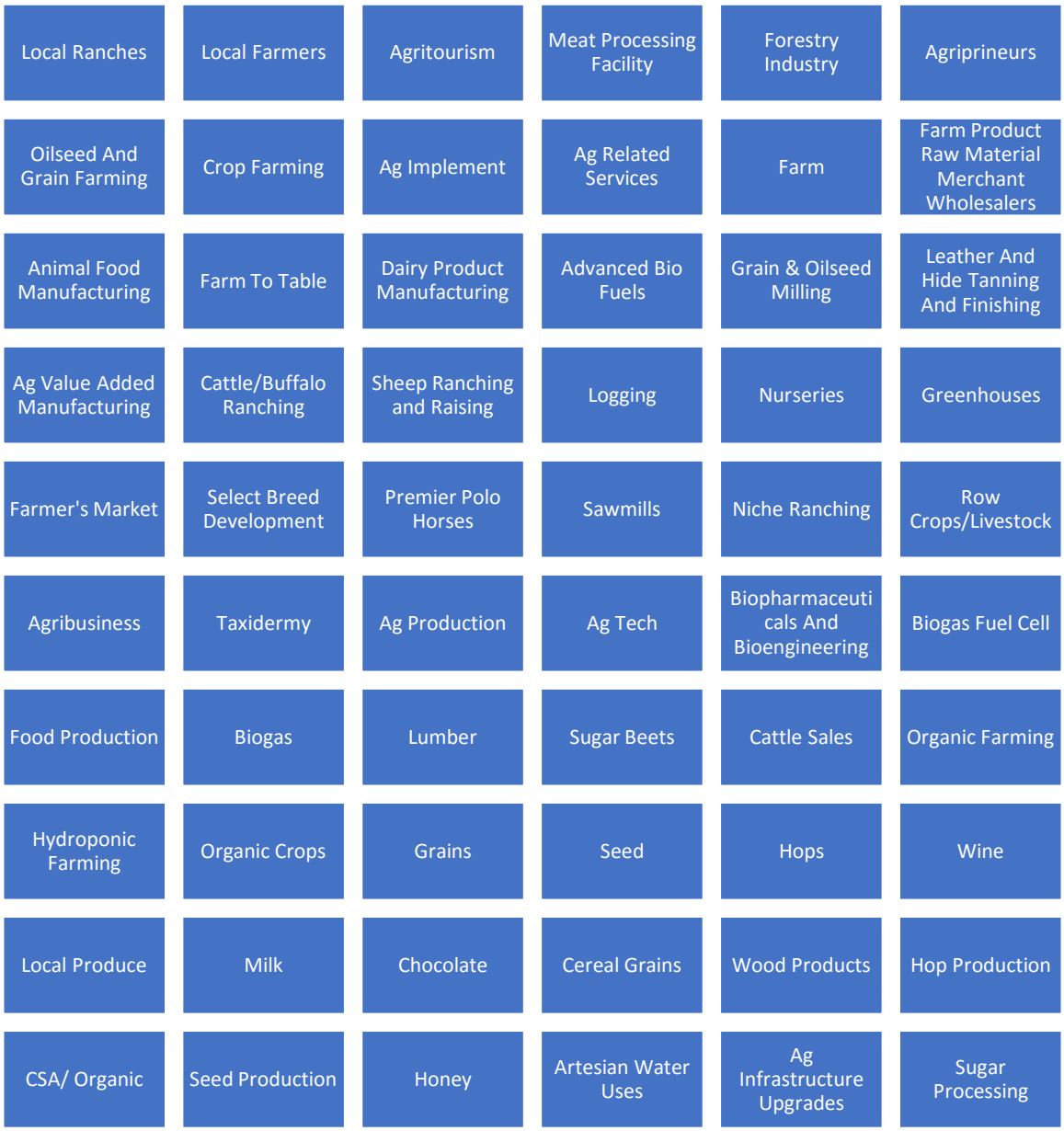
http://www.prnewswire.com/news-releases/biomass-gasification-market-global-industry-trends-share-size-growth-opportunity-and-forecast-2017-2022-300424368.html

http://www.building-products.com/January-2017/2017-Good-Signs-in-Wood-Products/

http://www.iufro.org/download/file/5896/4668/157-182_pdf/

Industry Focus Around the State

Communities around the state have identified the following specific focus industries within the agriculture sector. This data was collected using the ENDOW Regional Assessment.



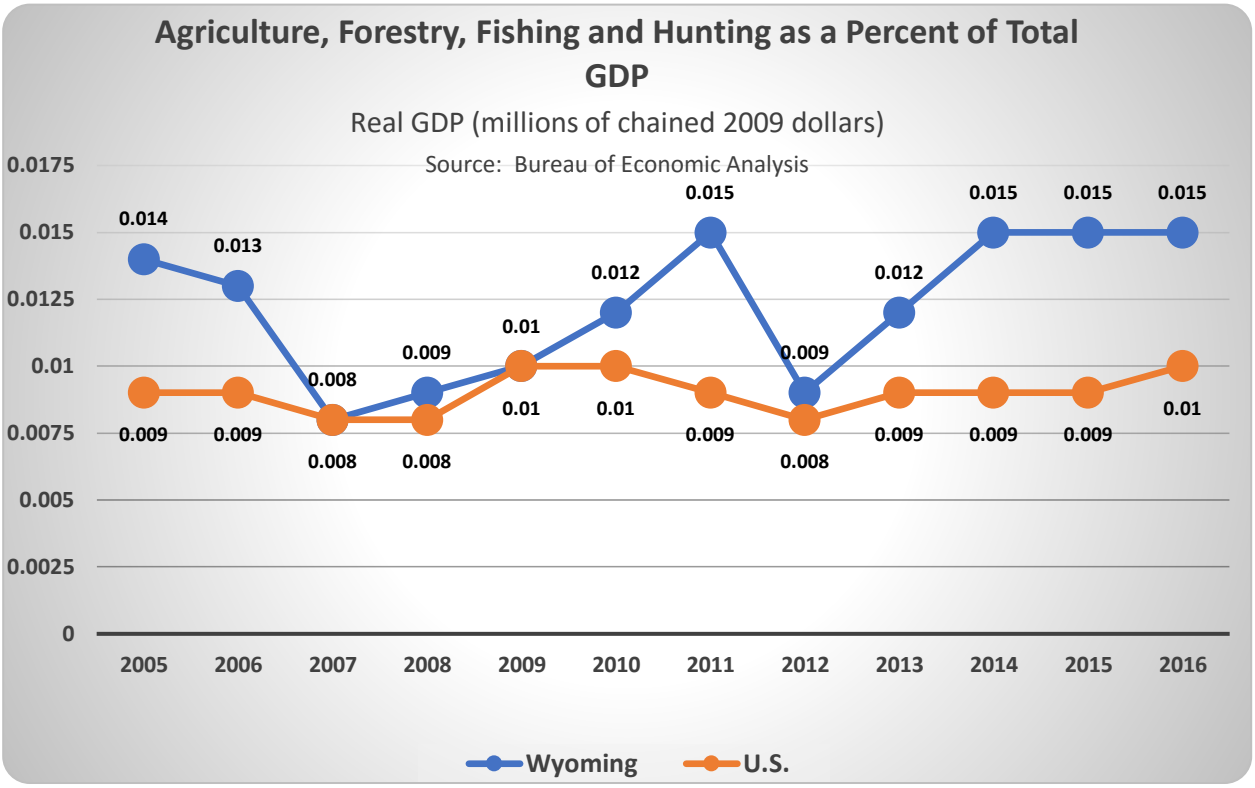
How does Wyoming compare?

Wyoming's Agriculture, Forestry, Fishing and Hunting GDP is .5% larger than that of the US.

WY Agriculture, Forestry, Fishing and Hunting as a % of Total GDP Real GDP (millions of chained 2009 dollars)			
Date	**Total GDP**	**Agriculture, Forestry, Fishing and Hunting**	**% of Total GDP**
2005	$29,637	$424	1.4%
2010	$36,469	$448	1.2%
2016	$34,439	$527	1.5%

U.S. Agriculture, Forestry, Fishing and Hunting as a % of Total GDP Real GDP (millions of chained 2009 dollars)			
Date	**Total GDP**	**Agriculture, Forestry, Fishing and Hunting**	**% of Total GDP**
2005	$14,203,241	$127,202	0.9%
2010	$14,628,165	$140,205	1.0%
2016	$16,342,925	$158,089	1.0%

Source: Bureau of Economic Analysis



Wyoming's GDP is .5% greater than that of the US.

Wyoming and United States Agriculture, Forestry, Fishing and Hunting Sector GDP

Real GDP (millions of chained 2009 dollars)

	2005				2010			
	WY		U.S.		WY		U.S.	
Industry	**GDP**	**% of Total Ag, Forestry, Fishing and Hunting GDP**	**GDP**	**% of Total Ag, Forestry, Fishing and Hunting GDP**	**GDP**	**% of Total Ag, Forestry, Fishing and Hunting GDP**	**GDP**	**% of Total Ag, Forestry, Fishing and Hunting GDP**
Farms	$ 374	88.2%	$ 101,646	79.9%	$ 354	79.0%	$ 111,455	79.5%
Forestry, Fishing, and Related Activities	$ 49	11.6%	$ 26,157	20.6%	$ 94	21.0%	$ 28,765	20.5%

	2015			
	WY		U.S.	
Industry	GDP	% of Total Ag, Forestry, Fishing and Hunting GDP	GDP	% of Total Ag, Forestry, Fishing and Hunting GDP
Farms	450	86.4%	114855	78.5%
Forestry, Fishing, and Related Activities	63	12.1%	32210	22.0%

Source: Bureau of Economic Analysis

States with the Highest and Lowest Shares of Agriculture, Forestry, Fishing and Hunting, 2016

(as a Percentage of Their Gross State Product)

Top Five States		Bottom Five States	
South Dakota	8.0%	Nevada	0.2%
Nebraska	6.5%	New York	0.2%
Iowa	5.6%	Massachusetts	0.2%
Idaho	5.1%	New Jersey	0.1%
North Dakota	4.6%	Connecticut	0.1%

In 2016, Wyoming ranked 14th in the nation at 1.5%

Agriculture, Forestry, Fishing and Hunting play an important role in our national economy, accounting for roughly 1.0 percent of the United States GDP.

Percentage Agriculture, Forestry, Fishing and Hunting Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Agriculture, Forestry, Fishing and Hunting GDP	% of Total GDP
Wyoming	$527	1.5%
Alaska	$522	1.1%
Colorado	$2,067	0.7%
Idaho	$3,043	5.1%
Montana	$1,599	3.9%
New Mexico	$1,027	1.2%
North Dakota	$2,192	4.6%
South Dakota	$3,345	8.0%
Utah	$713	0.5%
United States	$158,089	1.0%

Source: Bureau of Economic Analysis

Percentage Agriculture, Forestry, Fishing and Hunting Contributes to Total Employment

2016

	Agriculture, Forestry, Fishing and Hunting GDP	% of Total Employment
Wyoming	2,667	1.0%
Alaska	1,076	0.3%
Colorado	16,479	0.6%
Idaho	24,585	3.6%
Montana	5,542	1.2%
New Mexico	11,285	1.4%
North Dakota	4,485	1.1%
South Dakota	5,577	1.3%
Utah	5,606	0.4%
United States	1,258,724	0.9%

Source: Bureau of Labor Statistics

Wyoming and United States Agriculture, Forestry, Fishing and Hunting Sector Establishments								
	2005				2010			
Industry	WY		U.S.		WY		U.S.	
Agriculture, Forestry, Fishing and Hunting	#	% of Total Sector	#	% of Total Sector	#	% of Total Sector	#	% of Total Sector
Crop Production	78	19.8%	43,589	45.1%	95	21.1%	42,896	45.1%
Animal Production and Aquaculture	237	60.2%	21,208	22.0%	271	60.2%	22,619	23.8%
Forestry and Logging	35	8.9%	11,815	12.2%	22	4.9%	9,574	10.1%
Fishing, Hunting and Trapping	1	0.3%	2,664	2.8%	2	0.4%	2,442	2.6%
Agriculture and Forestry Support Activities	43	10.9%	17,293	17.9%	59	13.1%	17,574	18.5%
Total	394		96,569		449		95,105	

	2016			
Industry	WY		U.S.	
Agriculture, Forestry, Fishing and Hunting	#	% of Total Sector	#	% of Total Sector
Crop Production	103	21.0%	47,182	45.6%
Animal Production and Aquaculture	294	59.9%	25,254	24.4%
Forestry and Logging	26	5.3%	9,346	9.0%
Fishing, Hunting and Trapping	2	0.4%	2,567	2.5%
Agriculture and Forestry Support Activities	67	13.6%	19,157	18.5%
Total	492		103,506	

Businesses in the Sector

Wyoming and United States Firms, Employees and Annual Wage (2016)

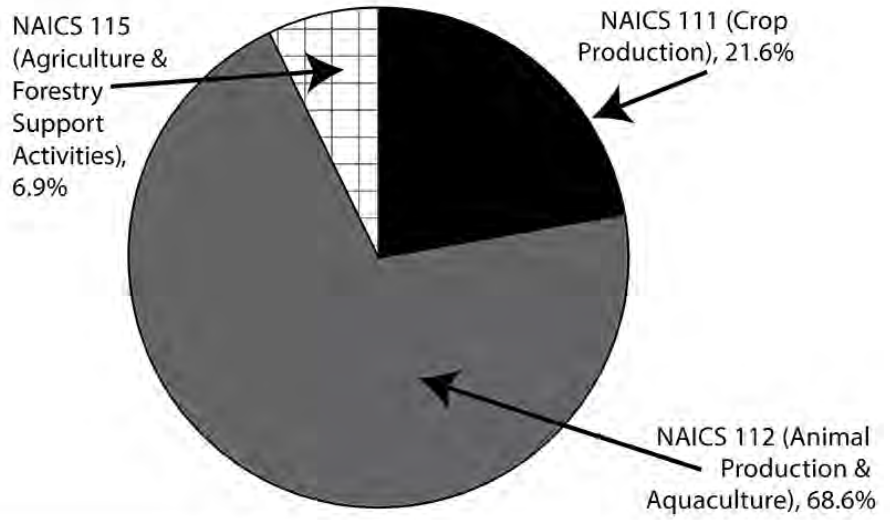
		Wyoming			United States		
NAICS Code	Industry	Firms	Employees	Annual Wages	Firms	Employees	Annual Wages
11	Agriculture, Forestry, Fishing and Hunting	491	2,667	33,546	103,505	1,258,724	33,309
111	Crop production	103	576	30,446	47,182	559,668	31,615
112	Animal production and aquaculture	294	1,829	33,980	25,254	258,755	36,302
113	Forestry and logging	26	0	0	9,346	56,743	44,519
114	Fishing, hunting and trapping	2	0	0	2,567	8,063	64,663
115	Agriculture and forestry support activities	67	184	35,631	19,157	375,494	31,403

Firms in Wyoming	
Total Firms	508
Average Age	11
Number Firms Under 5 Years Old	154
Number Firms 5-9 Years Old	120
Number Firms over 10 Years Old	234

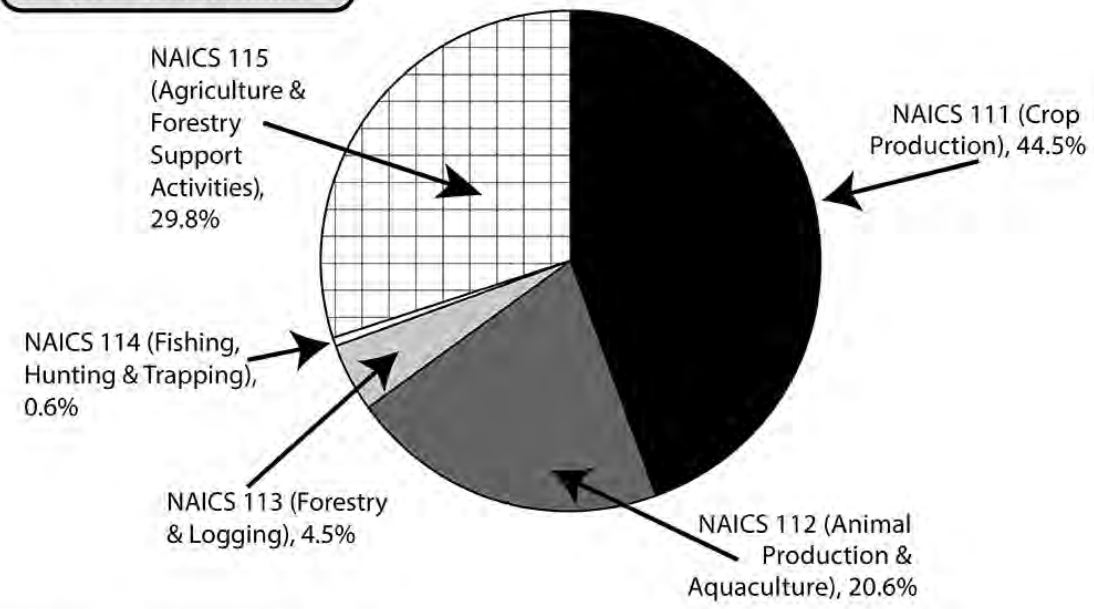
NAICS[a] 11: Agriculture, Forestry, Fishing & Hunting

Distribution of Jobs by 3-Digit NAICS Code in Wyoming and the U.S., 2016 Annual Average

Wyoming, N = 2,667[b]



U.S., N = 1.3 Million



[a]North American Industry Classification System.
[b]NAICS 113 and 114 for Wyoming are not discloseable due to confidentiality.
Source: Quarterly Census of Employment and Wages. U.S. Bureau of Labor Statistics.
Prepared by T. Glover and M. Moore, Research & Planning, WY DWS, 7/21/17.

Workforce

Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	143	1,059	$40,166
Colorado	2005	1,369	14,960	$24,441
Idaho	2005	2,002	21,170	$24,214
Montana	2005	955	4,417	$26,037
New Mexico	2005	758	11,762	$19,196
North Dakota	2005	511	2,872	$27,361
South Dakota	2005	469	3,181	$24,811
Utah	2005	372	4,405	$22,429
Wyoming	2005	394	2,321	$24,329
US	2005	96,569	1,163,629	$23,116

State	Year	Firms	Employees	Annual Wage
Alaska	2010	176	963	$42,639
Colorado	2010	1,404	13,670	$29,096
Idaho	2010	2,041	21,588	$27,725
Montana	2010	973	4,382	$28,142
New Mexico	2010	765	10,672	$24,617
North Dakota	2010	634	3,656	$34,993
South Dakota	2010	612	4,135	$30,845
Utah	2010	350	4,399	$27,103
Wyoming	2010	450	2,409	$28,358
US	2010	95,105	1,146,962	$26,635

State	Year	Firms	Employees	Annual Wage
Alaska	2016	224	1,076	$48,742
Colorado	2016	1,594	16,479	$34,998
Idaho	2016	2,226	24,585	$34,048
Montana	2016	1,126	5,542	$37,661
New Mexico	2016	857	11,285	$28,638
North Dakota	2016	926	4,485	$42,488
South Dakota	2016	921	5,577	$38,173
Utah	2016	475	5,606	$31,088
Wyoming	2016	491	2,667	$33,559
US	2016	103,505	1,258,724	$33,309

Occupations in Agriculture

Title	Mean Hourly	Mean Annual	Median Hourly	Median Annual
Total all occupations	$16	$34,114	$13	$27,602
Other Office and Administrative Support Workers	$17	$34,583	$17	$35,183
Office Clerks, General	$17	$34,583	$17	$35,183
Farming, Fishing, and Forestry Occupations	$17	$35,254	$16	$32,828
Supervisors, Farming, Fishing, and Forestry Workers	$21	$43,491	$21	$44,060
First-Line Supervisors of Farming, Fishing, and Forestry Workers	$21	$43,491	$21	$44,060
Agricultural Workers	$15	$30,222	$15	$31,136
Farmworkers, Farm, Ranch, and Aquacultural Animals	$13	$26,919	$12	$25,972
Forest, Conservation, and Logging Workers	$19	$39,608	$15	$32,154
Logging Equipment Operators	$21	$42,878	$18	$37,322

Exports

Top Five Agriculture, Forestry, Fishing and Hunting Export Markets (2016)
Percent of Total Goods Exports (95.5%) ~ Canada (49.2%) ~ Dominican Republic (44.3%) ~ United Arab Emirates (3.1%) ~ Mexico (1.0%) ~ South Africa (1.0%)

Wyoming Agriculture, Forestry, Fishing and Hunting Exports

Total Export Value ($US)

2005

NAICS	Commodity	Wyoming	% of Total Ag., Forestry, Fishing & Hunting	U.S.	% of Total Ag., Forestry, Fishing & Hunting Exports
111	Agricultural Products	$2,571,161	93.2%	$ 31,920,786,168	82.6%
112	Livestock & Livestock Products			$ 1,149,832,940	3.0%
113	Forestry Products, Nesoi	$ 109,713	4.0%	$ 1,741,359,895	4.5%
114	Fish, Fresh/Chilled/Frozen & Other Marine Produc	$ 78,726	2.9%	$ 3,844,793,278	9.9%

2010

NAICS	Commodity	Wyoming	% of Total Ag., Forestry, Fishing & Hunting	U.S.	% of Total Ag., Forestry, Fishing & Hunting Exports
111	Agricultural Products	$5,869,216	89.1%	$ 60,246,115,997	88.1%
112	Livestock & Livestock Products	$ 514,370	7.8%	$ 1,577,937,669	2.3%
113	Forestry Products, Nesoi	$ 152,772	2.3%	$ 2,285,165,486	3.3%
114	Fish, Fresh/Chilled/Frozen & Other Marine Produc	$ 50,904	0.8%	$ 4,240,128,806	6.2%

2016

NAICS	Commodity	Wyoming	% of Total Ag., Forestry, Fishing & Hunting	U.S.	% of Total Ag., Forestry, Fishing & Hunting Exports
111	Agricultural Products	$5,325,054	90.9%	$ 67,633,749,702	87.4%
112	Livestock & Livestock Products	$ 498,092	8.5%	$ 1,921,786,365	2.5%
113	Forestry Products, Nesoi	$ 33,195	0.6%	$ 2,434,692,149	3.1%
114	Fish, Fresh/Chilled/Frozen & Other Marine Products			$ 5,389,829,733	7.0%

Source: USA Trade, U.S. Census Bureau

Asset Maps

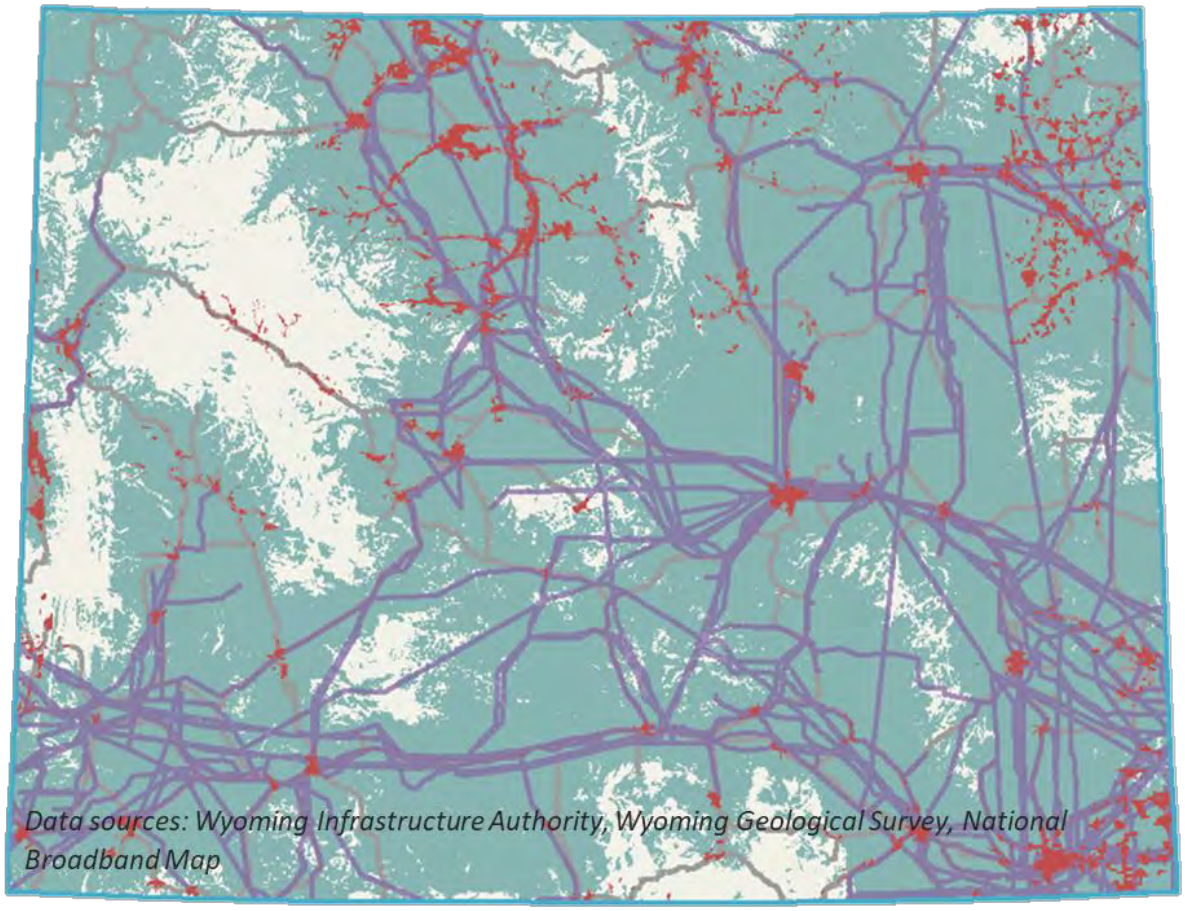
A baseline for delineating Business Development and Innovation Zones

Areas characterized by assets shown below, sites within these areas, areas characterized by one or more input assets (e.g. workforce), or intersections amongst sectors may be considered potential business development and innovation zones. More focused analyses will be presented in the report submitted to the Legislature and Governor before December 31st, 2017.

Mappable Sector Assets

Resource	Infrastructure
•Water*	•Road Transportation •Internet •Electricity

*Water is extremely important to the agricultural sector. However, because of the complex nature and intricacies of the water landscape in Wyoming, representing it on a statewide scale requires over generalization, resulting in misrepresentation. Therefore, we have omitted it from this statewide evaluation. As Business Development and Innovation Zones are further defined, water access will be considered further.



Data sources: Wyoming Infrastructure Authority, Wyoming Geological Survey, National Broadband Map

Transmission Lines

Highways

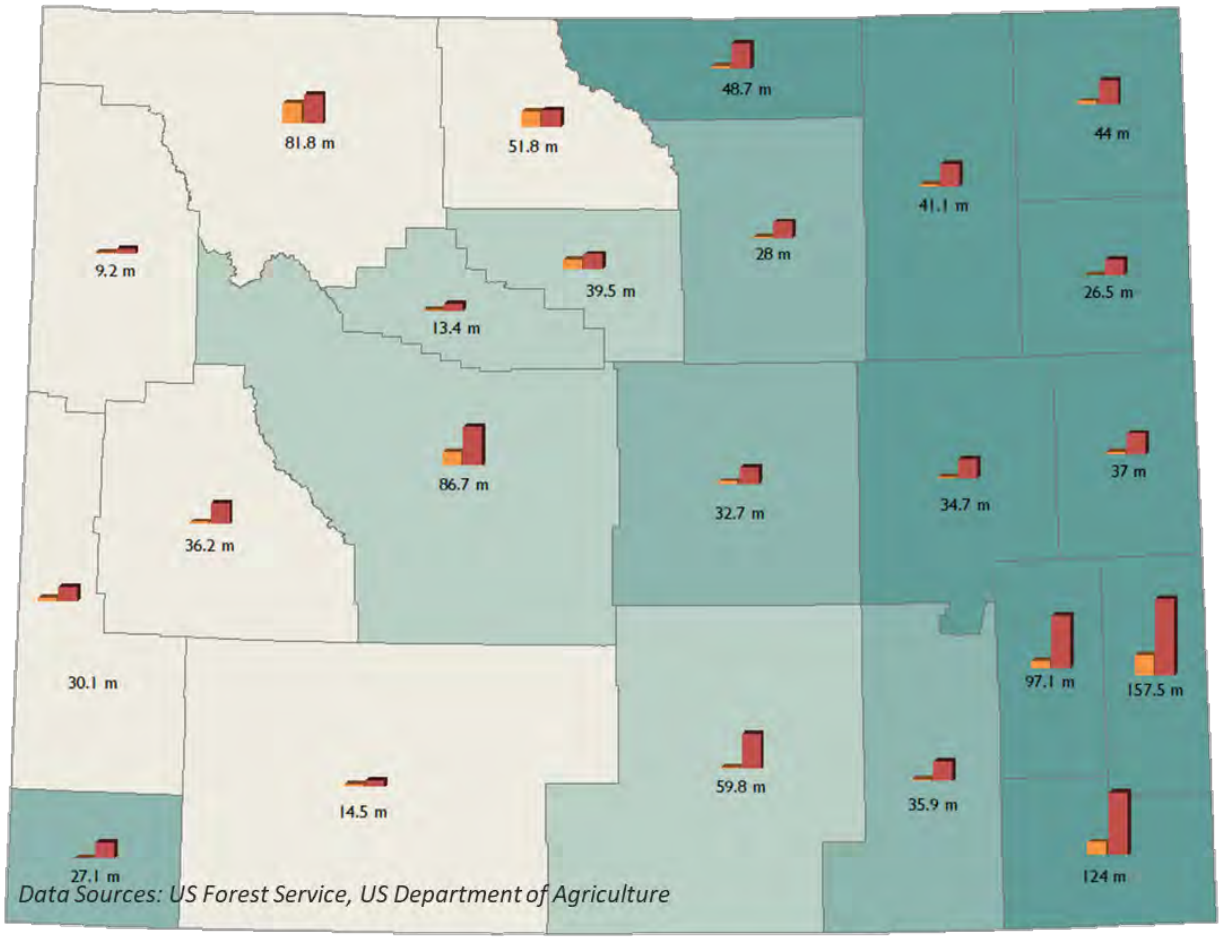
Internet

Broadband to the End User

Wireless

Satellite

Current Agriculture



Asset Mapping Conclusions

Agriculture has an important presence across the state, especially in the eastern counties. Infrastructure plays an important enabling role to agriculture, but agriculture can thrive in areas that lack some infrastructure.

Important crossovers amongst this sector and others—e.g. Manufacturing, Professional and Business Services—could help to diversify Wyoming's economy while leveraging our rich and diverse natural resource base.

Enablers, Incentives, Challenges

Industry Input

Evidence economic value of outfitted hunters. In 2016, WYOGA contracted with Southwick Associates, one of the nation's leading outdoor research and economics firms to produce this study on how important big game hunting is to the state's economy. Using surveys of Wyoming's licensed resident and nonresident big game hunters, combined with economic models specific to Wyoming's economy, economic insights were generated for all big game hunters combined, along with breakouts for residents, guided nonresidents and unguided nonresident big game hunters. The economic study hunting overview was big game hunters spent over $303.6 million annually to hunt the state of Wyoming. This study cost WYOGA over $41,000 to produce.

-Wyoming Outfitters & Guides Association

Stable and consistent access to big game hunting licenses. If we could fix this, our industry could double in five years.

-Wyoming Outfitters & Guides Association

Developed agricultural culture and community, widespread prevalence and advocacy of agriculture

Ag, Forestry, Fishing, and Hunting
Enablers
Robust hunting and fishing industry in Wyoming
Strong tourism market brings new money into economy
Wyoming's outdoor lifestyle and livability
World class recreation attractions
Outdoor Recreation Task Force
Outdoor Recreation is a targeted industry for WBC
Incentives
Taxing of agricultural land
Premium Heifer Program
Wyoming Verified Program
Wyoming Grown Program
Wyoming Value-added Loan
Challenges
Unskilled, entry-level workforce
Uncertain future land-use and access at federal level

Opportunities

- Agriculture technologies
- Value added agricultural manufacturing

Industry Input

Take advantage of what we already have. Lots of animals, open spaces, quality outfitting industry. We need stable licensing.

-Wyoming Outfitters & Guides Association

Mining, Quarrying, Oil and Gas (21)

Summary of Sector

Businesses in the Sector

The Mining, Quarrying, and Oil and Gas Extraction sector comprises companies that extract naturally occurring mineral solids and liquids. They include companies who extract oil and gas, coal, metals, gravel, and other minerals. This sector also includes support activities for mining and oil and gas extraction. See Appendix 1 for a comprehensive list of NAICS codes in this sector.

Wyoming Compared to Other States

This sector contributes much more to Wyoming's economy than it does to comparator states' and the US, representing 30.1% of Wyoming's GDP, and 1.5% of US GDP. If mining GDP is cut in half, Wyoming could lose about $4.2 billion in revenues that need to be made up somewhere else.

Workforce

Wyoming employment in this sector has historically been higher than comparator states, but dropped below some of peers in 2016. Wages within this sector pay above the mean and median for all occupations, and Wyoming wages in this sector are near the average of comparator states.

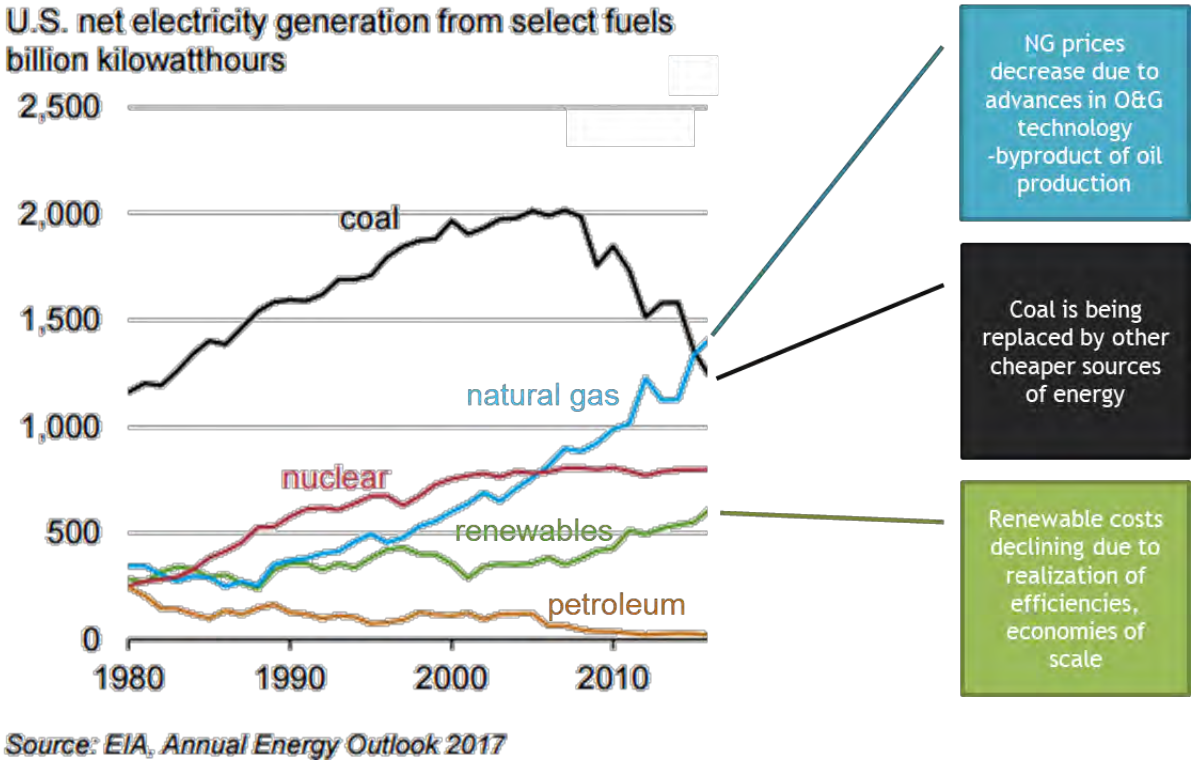
Barriers, Assets, and Enablers

One of the most significant barriers to this sector in Wyoming is inefficient permitting.

Opportunities in this sector include leveraging Wyoming's robust natural resource base extracted in this sector to drive growth in research and development, tech companies, manufacturing, and other underrepresented sectors, CO2 capture and use for enhanced oil recovery, and exploiting advances in technology to improve economics in Wyoming resources plays.

Safety is a perennial priority for well-regarded companies in this sector, and safety metrics are important in evaluating shareholder value. Innovations in horizontal drilling have bolstered US oil and gas production in the last decade, and have drawn some producers' focus to onshore plays, including those in Wyoming. In recent years, low coal, oil, gas, and renewable prices have led to greater competition in the electricity generation market, decreased production of traditional resources, reduced shareholder value, and significant reductions in employed workforce. These effects can be seen in Wyoming and globally. The downturn has also driven innovation to reduce costs and increase efficiency, and focused US producers' attention on plays that can break even at low prices (such as the Permian Basin in west Texas).

US ELECTRICITY GENERATION



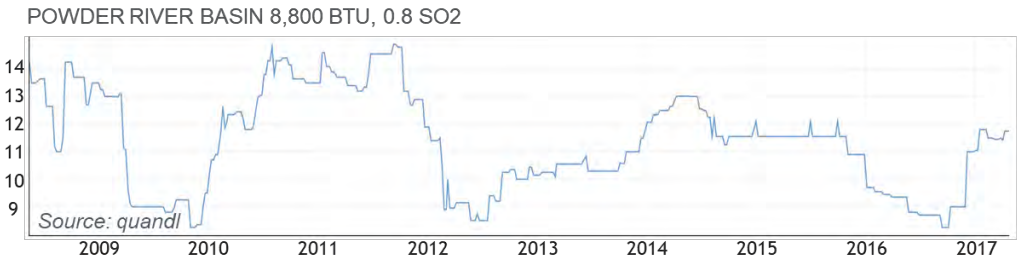
Source: EIA, Annual Energy Outlook 2017

OIL & GAS

Despite "lower for longer" predictions, oil & gas companies are playing the long game when it comes to talent recruitment and retention. Upstream companies looking to relocate (e.g. BP, who recently announced a move to Denver) look for places with a pipeline of science and engineering talent. Enablers to this are high-quality universities and livability.

COAL

- Oversupply and resulting low prices of natural gas driven by advances in technology have shifted demand away from coal
- Renewables are also cost competitive
- PRB coal trading at $11.75

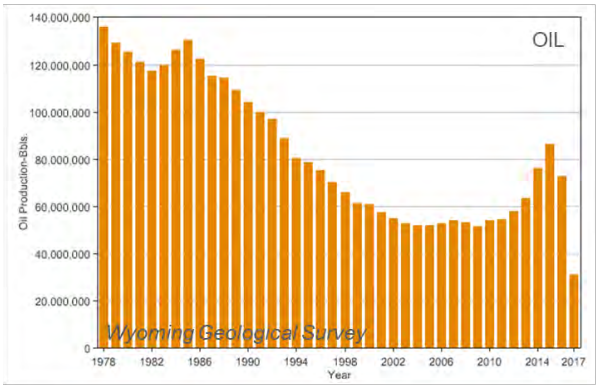


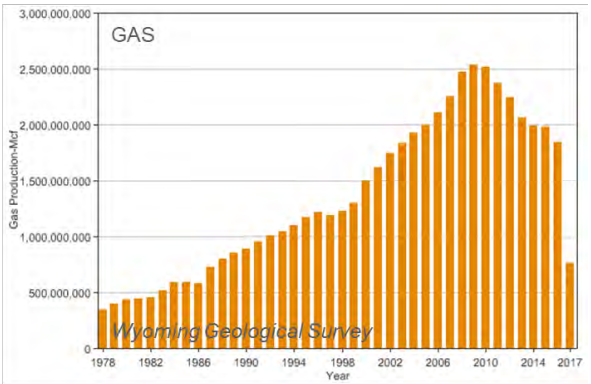
The New Carbon Economy

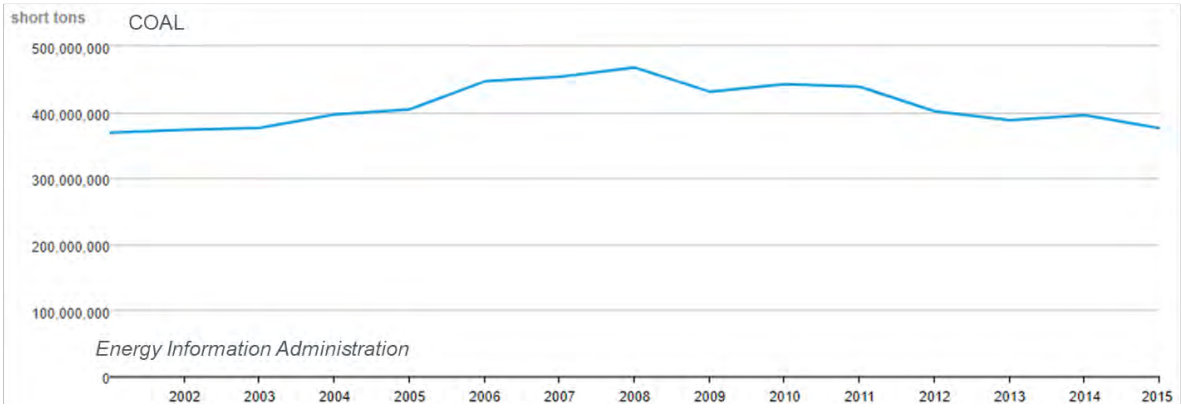
- Efforts by the SER & others to monetize coal and CO2 in ways other than burning it for energy
  - ITC, Advanced Carbon Products Innovation Center
  - Coal Refinery
- Challenges include market entrance, current substitutes, capital intensive

WYOMING PRODUCTION

Decreases in coal, oil, and natural gas prices in recent years have lead to dramatic decreases in Wyoming production.



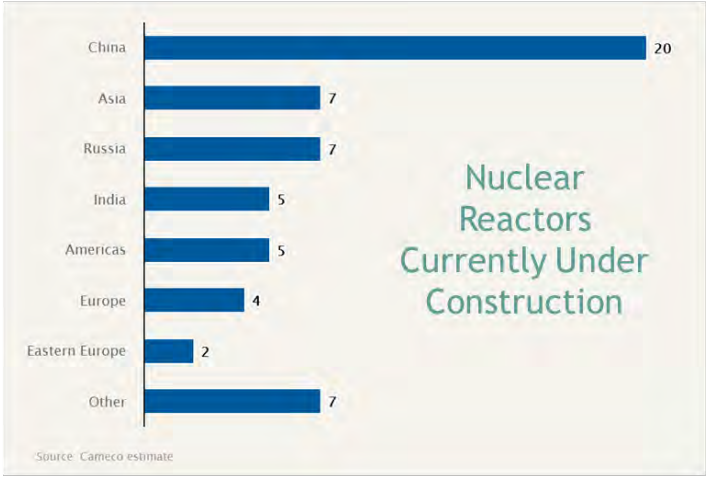




URANIUM

Wyoming is the #1 producer of Uranium in the US

Wyoming Mining Association



- Fukushima disaster caused trepidation around Nuclear energy
- Despite this, more than 100 new nuclear reactors are currently under construction around the world

OTHER MINERALS

Trona

- Wyoming has the largest natural supply of Trona in the world
- Used to make baking soda
- Competition is man-made Trona
- Steady market

Bentonite

- Wyoming is #1 producer in the US
- Used for drilling mud, kitty litter, other uses
- Another stable market

Metals

- Numerous relatively small resources around the state
- Protected areas present constraints
- US metals could benefit from USA-made preferences and policies

Statistics and uses from the Wyoming Mining Association

In addition to these resource-specific trends, the following trends are observed across the entire Mining, Quarrying, and Oil and Gas Extraction sector.

Shareholder Value: Despite positive indicators, mining share performance continues to lag, driving the imperative for companies to redefine shareholder value. To drive sustainable growth as a way to enhance shareholder value amidst market volatility, mining companies should consider adopting a series of short and long-term strategies which include: pursuing top-line growth, optimizing portfolios, furthering widen margins, being more agile, and changing the rules of the game to encourage long term investments.

Innovation: Technology is key to drive the next wave of productivity gains. Companies are leveraging learnings from other industries and are exploring the benefits of full automation, artificial intelligence, 3D printing, lean operations and outsourcing. Proactive approach: Miners need to integrate innovation across regional and functional lines by adopting the appropriate systems, processes and technologies, measuring progress, and making a cultural commitment to guide business decisions and actions.

Collaboration: Mining innovation hubs are emerging to encourage greater industry collaboration amongst technology start-ups, businesses, industry leaders, government and academia to find creative solutions to resource challenges in mining. Miners need to move out of their comfort zones and be more proactive on collaborating. Other strategies to promote a systematic approach to operating within an ecosystem include: turning vendors into partners' collaborating with competitors and building extended partnerships.

Technology: Mining companies are starting to explore the potential benefits of digitization as a way to improve the way they operate. Embracing digitization involves more than just investing in apps and solutions. To thrive in the digital future, mining companies should articulate a clear digital strategy, define a supporting digital architecture and foster the right skills and capabilities.

Security Threat: As more data moves into the cloud, IT and OT technologies converge and digital innovation becomes the norm, mining companies will be more exposed to online threats. As the cyber threat landscape evolves, mining companies need to adopt a more rigorous approach in cyber security. They need to strengthen traditional security controls, become more vigilant and cultivate resilience.

Regulation: The relationship between governments and mining companies has long been fraught with tension. In many cases, governments are trying to balance their desire to attract mining investment with their need to raise the funds required to support local economic and social development and hence they are looking for new ways to bring divergent stakeholder interests into alignment.

Social License: The mining sector is facing greater challenges in winning the social license to operate in community's due to the environmental impact resulting from recent catastrophic accidents at mines and from the pollution caused by greenhouse gas emissions. • Regulators also expect mining companies to comply with a range of mandatory and voluntary environmental disclosures, detailed in guidelines issued by the International Council of Mining and Metals (ICMM), the Global Reporting Initiative (GRI), the Extractive Industries Transparency Initiative (EITI) and other local regulatory bodies.

Operations: Miners have come to realize the imperative of transforming their operating models (from functional outsourcing and process redesign to revised approaches towards centralization and decentralization) in order to sustain growth. Some companies chose to decentralize their management approach to foster a high-performance culture and to instill greater accountability at the mine site while helping companies improve their returns while lowering risk. Others have taken a centralized approach as a way to enhance oversight, quality control and service levels by eliminating duplication; streamlining, automating and standardizing processes which could potentially improve service levels and response times

Workforce: Fostering healthy workforces and inclusive workplace are fundamental to sustainable productivity improvements. As the mining industry becomes more digital in its operations, it will compete with other sectors for in-demand skillsets from all over the world. Pay alone will not be enough to attract talent.

Transparency: Mining companies face increasing scrutiny as governments and regulatory bodies are demanding greater levels of transparency, including financial disclosures and international tax reporting. True transparency, in the light of these growing mandates, requires mining companies to adopt a strategic and integrated approach to reporting.

Source: https://www2.deloitte.com/global/en/pages/energy-and-resources/articles/tracking-the-trends.html

Industry Focus Around the State

Communities around the state have identified the following specific focus industries within the Mining, Quarrying, and Oil and Gas sector. This data was collected using the ENDOW Regional Assessment (see Methods section).

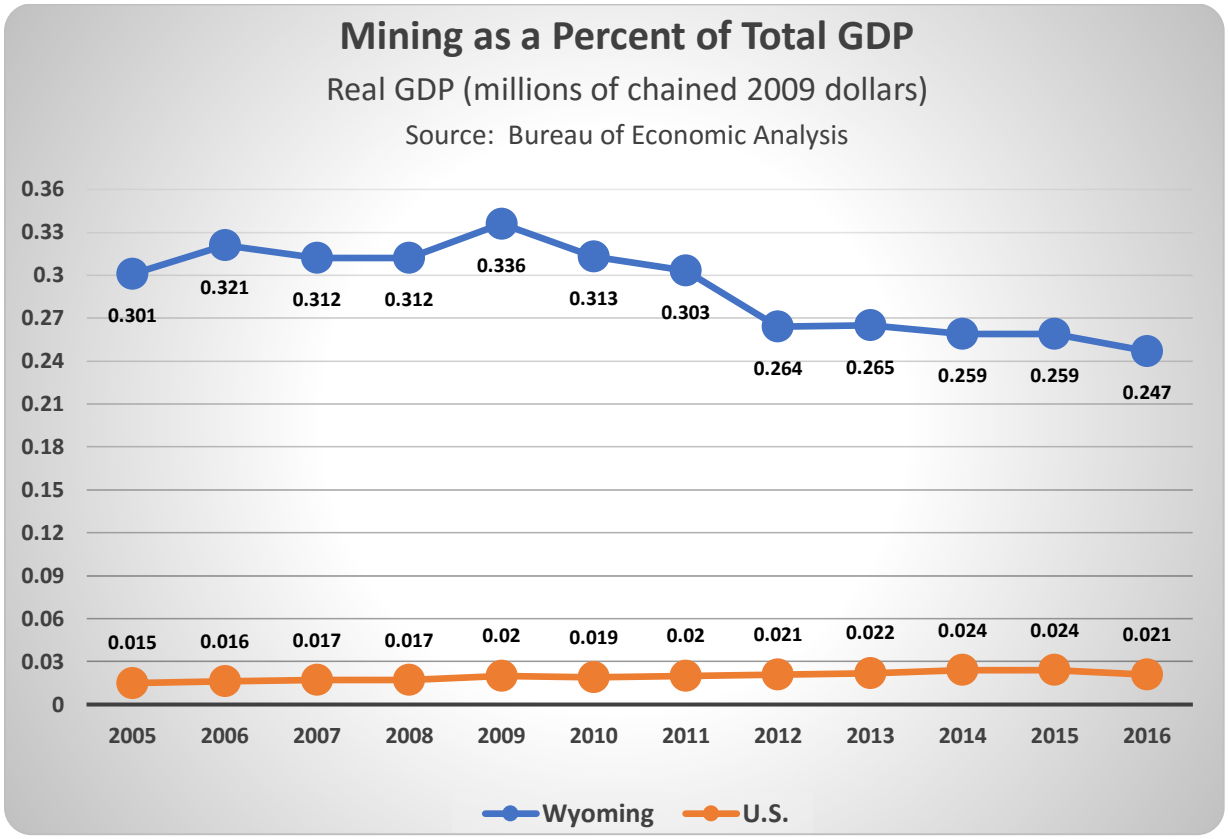
Bentonite Mining, Processing & Packaging	CO2 Capture, Use & Sequestration	Coal Extraction
Coal to Liquid Gasification	Compressed Natural Gas	Enhanced Oil Recovery
Fracking Service Industry	Gold Mining	Horizontal Drilling
Iron Mine	Liquid Natural Gas	Lithium Extraction
Locally owned oil pumps	Natural Gas Extraction & Development	Oil Extraction & Development
Petro-Chemical Production	Rare Earth Recources	Sulfur Extraction
Trona Extractions and Processing	Uranium Company Headquarters	Uranium Mining & Processing

How does Wyoming compare?

Wyoming and the US

WY Mining as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Mining	% of Total GDP
2005	$29,637	$8,928	30.1%
2010	$36,469	$11,415	31.3%
2016	$34,439	$8,523	24.7%

U.S. Mining as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Mining	% of Total GDP
2005	$14,203,241	$212,911	1.5%
2010	$14,628,165	$272,711	1.9%
2016	$16,342,925	$348,880	2.1%



Wyoming's Mining GDP is 22.6% over that of the National GDP. If mining GDP is cut in half, Wyoming could lose about $4.2 billion in revenues that need to be make up somewhere else.

Wyoming and United States Mining Sector GDP

Real GDP (millions of chained 2009 dollars)

Industry	2005 WY GDP	2005 WY % of Total Mining GDP	2005 U.S. GDP	2005 U.S. % of Total Mining GDP	2010 WY GDP	2010 WY % of Total Mining GDP	2010 U.S. GDP	2010 U.S. % of Total Mining GDP
Oil and Gas Extraction	$3,933	44.1%	$120,935	56.8%	$ 4,795	42.0%	$158,615	58.2%
Mining, except Oil and Gas	$3,874	43.4%	$ 69,408	32.6%	$ 5,130	44.9%	$ 70,026	25.7%
Support Activities for Mining	$1,381	15.5%	$ 30,944	14.5%	$ 1,569	13.7%	$ 45,973	16.9%

Source: Bureau of Economic Analysis

Industry	2015 WY GDP	2015 WY % of Total Mining GDP	2015 U.S. GDP	2015 U.S. % of Total Mining GDP
Oil and Gas Extraction	$4,467	48.2%	$281,712	71.8%
Mining, except Oil and Gas	$3,740	40.4%	$ 59,536	15.2%
Support Activities for Mining	$1,169	12.6%	$ 51,992	13.3%

States with the Highest and Lowest Shares of Mining, 2016

(as a Percentage of Their Gross State Product)

Top Five States		Bottom Five States	
Wyoming	24.7%	Massachusetts	0.063%
Alaska	21.2%	New Hampshire	0.061%
Oklahoma	15.7%	New York	0.060%
West Virginia	14.6%	New Jersey	0.048%
North Dakota	12.3%	Maine	0.044%

In 2016, Wyoming ranked 1st in the nation at 4.3%

Mining plays an important role in our national economy, accounting for roughly 2.1 percent of the United States GDP.

Percentage Mining Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Mining GDP	% of Total GDP
Wyoming	$8,523	24.7%
Alaska	$10,068	21.2%
Colorado	$14,370	4.9%
Idaho	$493	0.8%
Montana	$1,382	3.4%
New Mexico	$9,646	11.2%
North Dakota	$5,850	12.3%
South Dakota	$128	0.3%
Utah	$2,389	1.8%
United States	$348,880	2.1%

Source: Bureau of Economic Analysis

Percentage Mining Contributes to Total Employment

2016

	Mining Employment	% of Total Employment
Wyoming	18,776	6.9%
Alaska	14,235	4.4%
Colorado	23,575	0.9%
Idaho	2,367	0.3%
Montana	6,393	1.4%
New Mexico	19,819	2.5%
North Dakota	15,303	3.7%
South Dakota	849	0.2%
Utah	8,493	0.6%
United States	613,356	0.4%

Source: Bureau of Labor Statistics

Wyoming and United States Mining Sector Establishments

Industry	2005				2010				2016			
	WY		U.S.		WY		U.S.		WY		U.S.	
Retail Trade	#	% of Total Mining	#	% of Total Mining	#	% of Total Mining	#	% of Total Mining	#	% of Total Mining	#	% of Total Mining
Oil and Gas Extraction	215	22.3%	7,735	29.4%	229	20.3%	9,096	28.9%	219	22.5%	9,088	26.5%
Mining, except Oil and Gas	78	8.1%	7,580	28.8%	79	7.0%	7,529	23.9%	79	8.1%	7,094	20.7%
Support Activities for Mining	669	69.5%	10,999	41.8%	818	72.6%	14,880	47.2%	674	69.3%	18,057	52.7%
	962		26,314		1,126		31,505		972		34,239	

Businesses in the sector

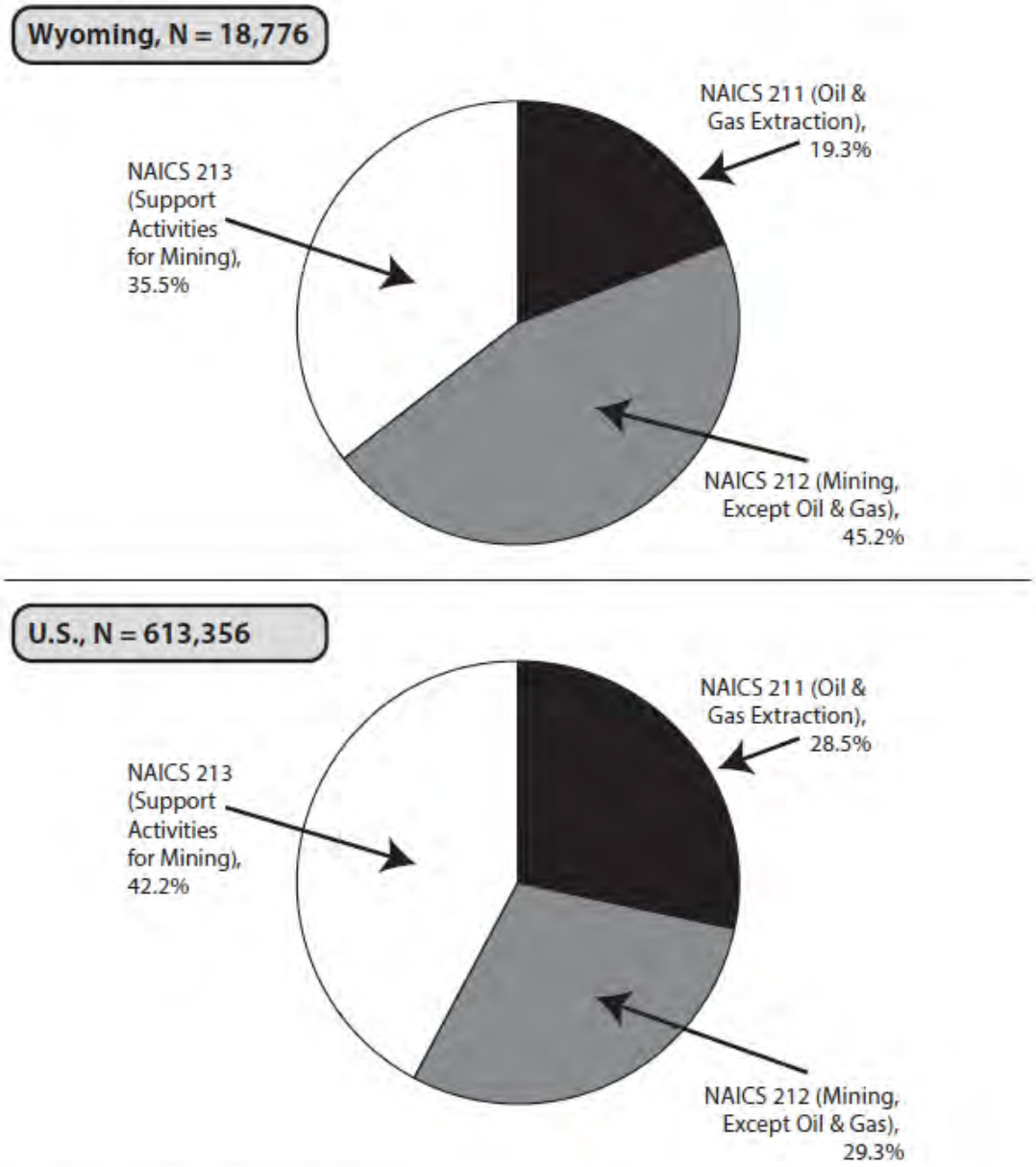
There are 1,123 total businesses in the Mining, Quarrying, and Oil and Gas Extraction sector in Wyoming. Their average age is ten years old. 446 businesses are under five years old, 241 are between five and nine years old, and 436 are greater than ten years old.

		Wyoming			United States		
NAICS Code	Industry	Firms	Employees	Annual Wages	Firms	Employees	Annual Wages
21	Mining, Quarrying, and Oil and Gas Extraction	972.00	18,776.00	84,445.00	34,239.00	613,356.00	102,900.00
211	Oil and gas extraction	219.00	3,624.00	107,738.00	9,088.00	174,961.00	161,227.00
212	Mining, except oil and gas	79.00	8,493.00	86,461.00	7,094.00	179,780.00	73,928.00
213	Support activities for mining	674.00	6,659.00	69,171.00	18,057.00	258,615.00	83,579.00

Firms in Wyoming	
Total Firms	1123
Average Age	10
Number Firms Under 5 Years Old	446
Number Firms 5-9 Years Old	241
Number Firms over 10 Years Old	436

NAICS[a] 21: Mining, Quarrying, & Oil And Gas Extraction

Distribution of Jobs by 3-Digit NAICS Code in Wyoming and the U.S., 2016 Annual Average



[a]North American Industry Classification System.
Source: Quarterly Census of Employment and Wages. U.S. Bureau of Labor Statistics.
Prepared by T. Glover and M. Moore, Research & Planning, WY DWS, 7/21/17.

Workforce

Not all occupations are labeled here.

Wyoming and Comparator States

2005

state	firms	employment	annual wage
Alaska	207	10,518	95,086
Colorado	1,086	17,007	83,210
Idaho	152	2,164	45,707
Montana	353	6,741	58,105
New Mexico	718	16,860	54,811
North Dakota	205	4,111	57,053
South Dakota	59	789	42,298
Utah	414	8,472	57,347
Wyoming	962	22,657	61,886
US	26,313	560,416	72,226

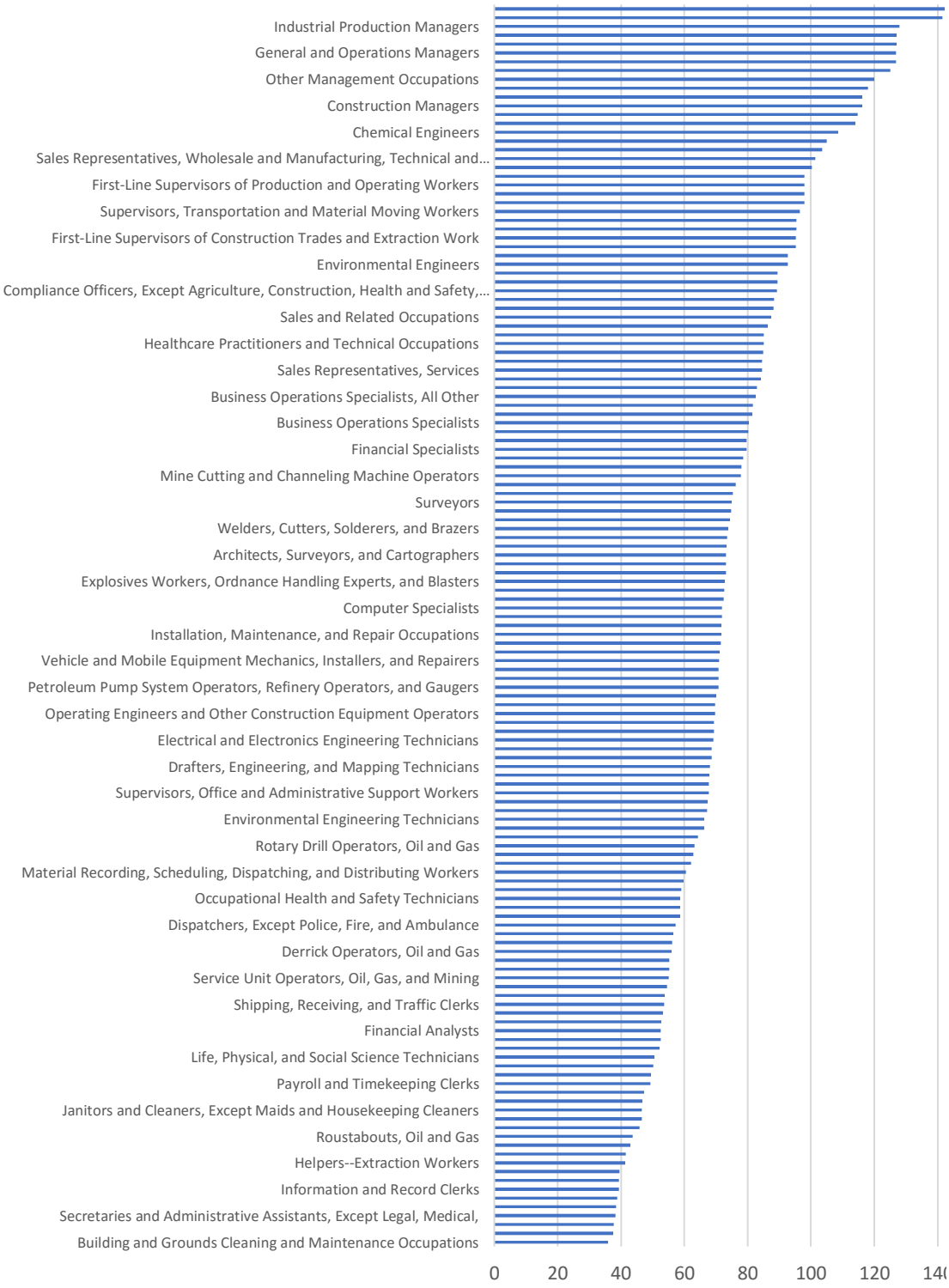
2010

state	firms	employment	annual wage
Alaska	210	15,155	115,755
Colorado	1,544	24,232	99,131
Idaho	167	2,290	66,791
Montana	435	6,862	74,970
New Mexico	916	18,423	74,963
North Dakota	351	10,660	79,976
South Dakota	65	818	49,723
Utah	558	10,442	70,041
Wyoming	1,126	25,098	77,169
US	31,504	651,631	90,628

2016

state	firms	employment	annual wage
Alaska	256	14,235	128,913
Colorado	1,611	23,575	114,629
Idaho	171	2,367	71,636
Montana	543	6,393	88,212
New Mexico	1,214	19,819	74,455
North Dakota	831	15,303	96,290
South Dakota	69	849	58,204
Utah	598	8,493	80,628
Wyoming	972	18,776	84,450
US	34,239	613,356	102,900

Wyoming Median Annual Mining, Quarrying, and Oil & Gas Wages (Thousands of Dollars)



Exports

Wyoming Mining Exports

Total Export Value ($US)

2005

NAICS	Commodity	Wyoming	% of Total Mining Exports	U.S.	% of Total Mining Exports
211	Oil and Gas	$ 444,187	0.7%	$ 4,601,872,903	36.1%
212	Minerals and Ores	$ 64,186,586	99.3%	$ 8,132,685,500	63.9%

2010

NAICS	Commodity	Wyoming	% of Total Mining Exports	U.S.	% of Total Mining Exports
211	Oil and Gas	$ 61,846,765	62.9%	$ 9,643,007,423	35.9%
212	Minerals and Ores	$ 36,448,113	37.1%	$ 17,245,865,797	64.1%

2016

NAICS	Commodity	Wyoming	% of Total Mining Exports	U.S.	% of Total Mining Exports
211	Oil and Gas	$ 11,395,050	22.0%	$ 22,650,775,194	65.7%
212	Minerals and Ores	$ 40,451,715	78.0%	$ 11,813,075,357	34.3%

Source: USA Trade, U.S. Census Bureau

Top Five Mining Export Markets (2016)

Percent of Total Mining Goods Exports (95.5%)

- ~ Canada (47.7%)
- ~ Mexico (25.3%)
- ~ Saudi Arabia (15.8%)
- ~ Netherlands (5.0%)
- ~ Australia (1.9%)

Asset Maps

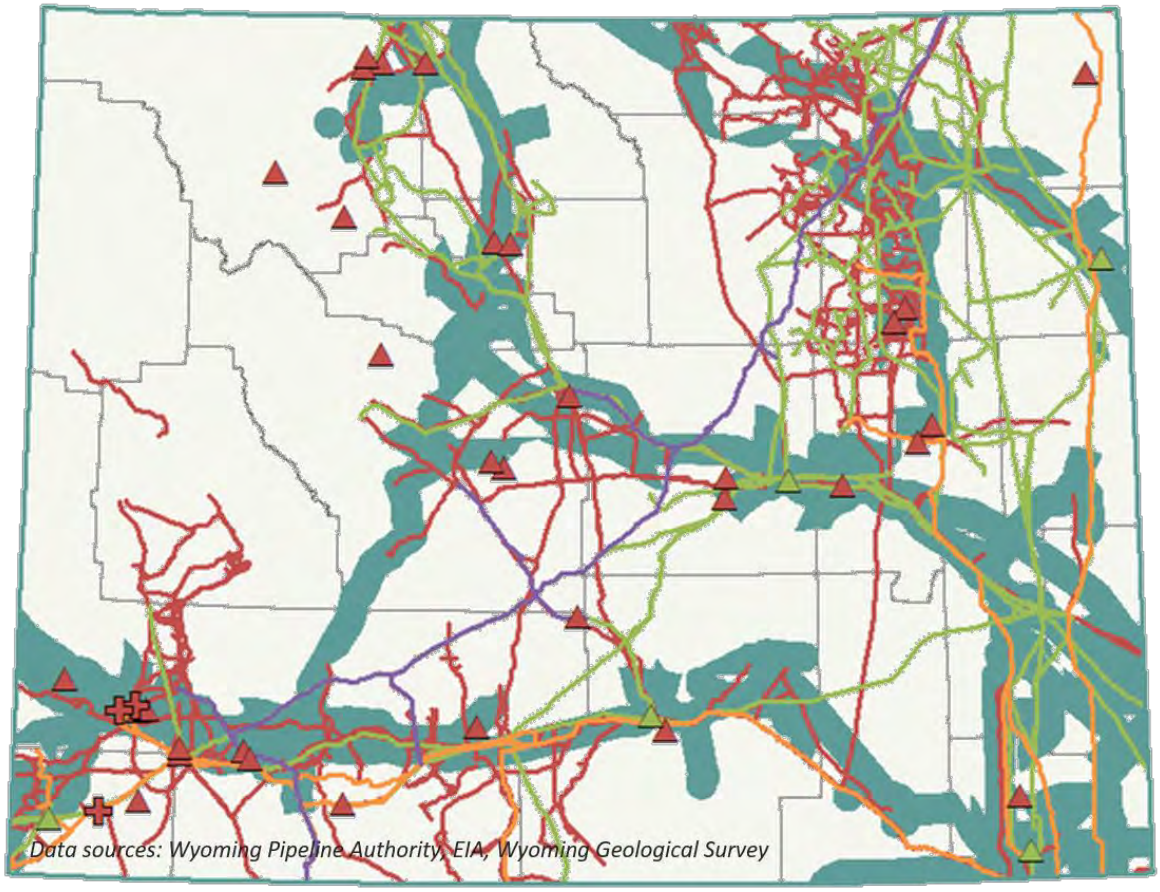
A baseline for delineating Business Development and Innovation Zones

Intersections shown below, sites within these areas, areas characterized by one or more input assets (e.g. workforce), or intersections amongst sectors may be considered potential business development and innovation zones. More focused analyses will be presented in the report submitted to the Legislature and Governor before December 31st, 2017.

Mappable Sector Assets

Infrastructure	Resource
•Transportation •Railroads •Road •Air •Pipelines •Electricity •Water	•Oil & Gas •Coal •Trona •Bentonite •Uranium •REE and Other Minerals

Infrastructure



Oil Trunk Lines
Natural Gas Trunk Lines
Natural Gas Liquids Trunk Lines
CO2 Trunk Lines

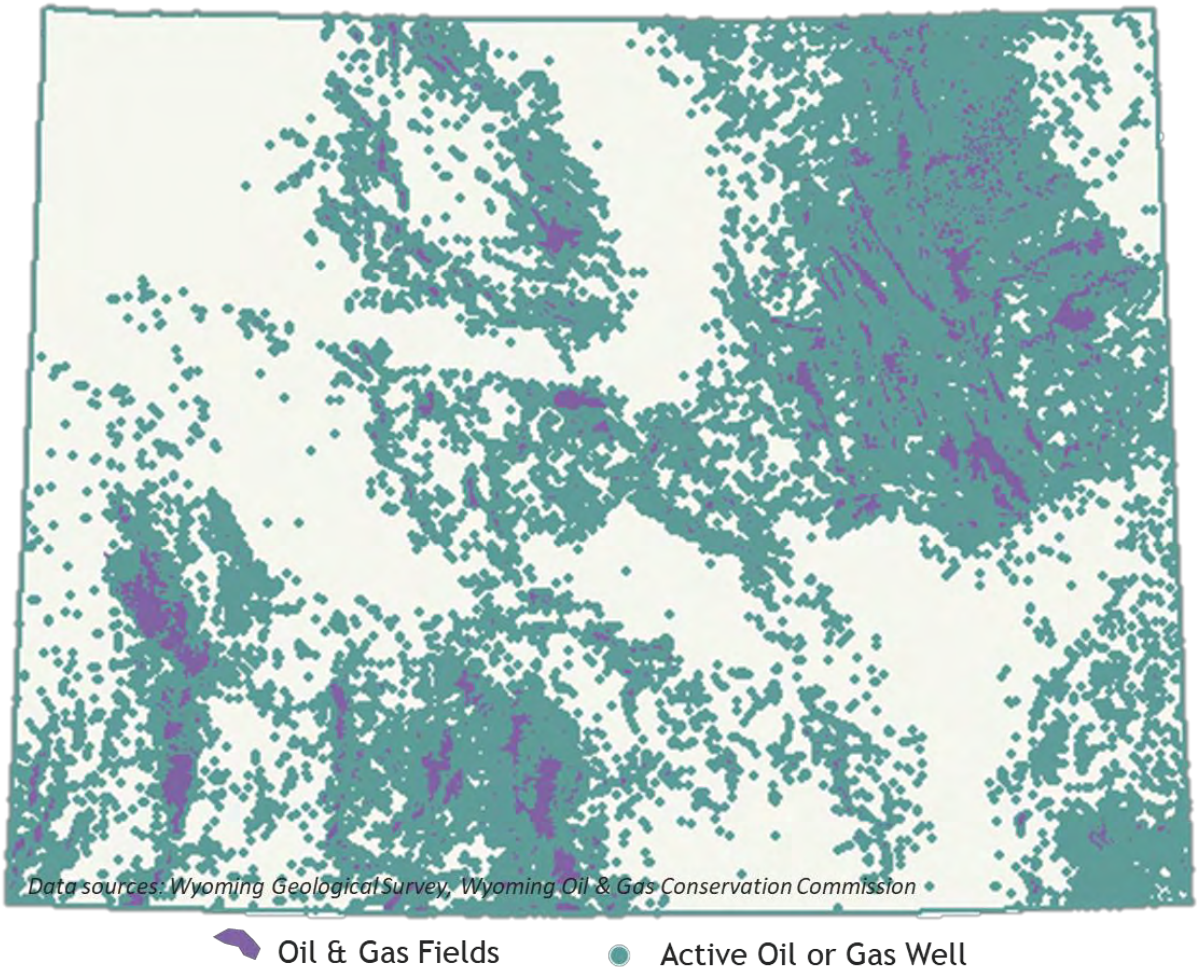
Natural Gas Hub
Petroleum Refineries
Natural Gas Processing Plant

Within 10 miles of highway and railroad

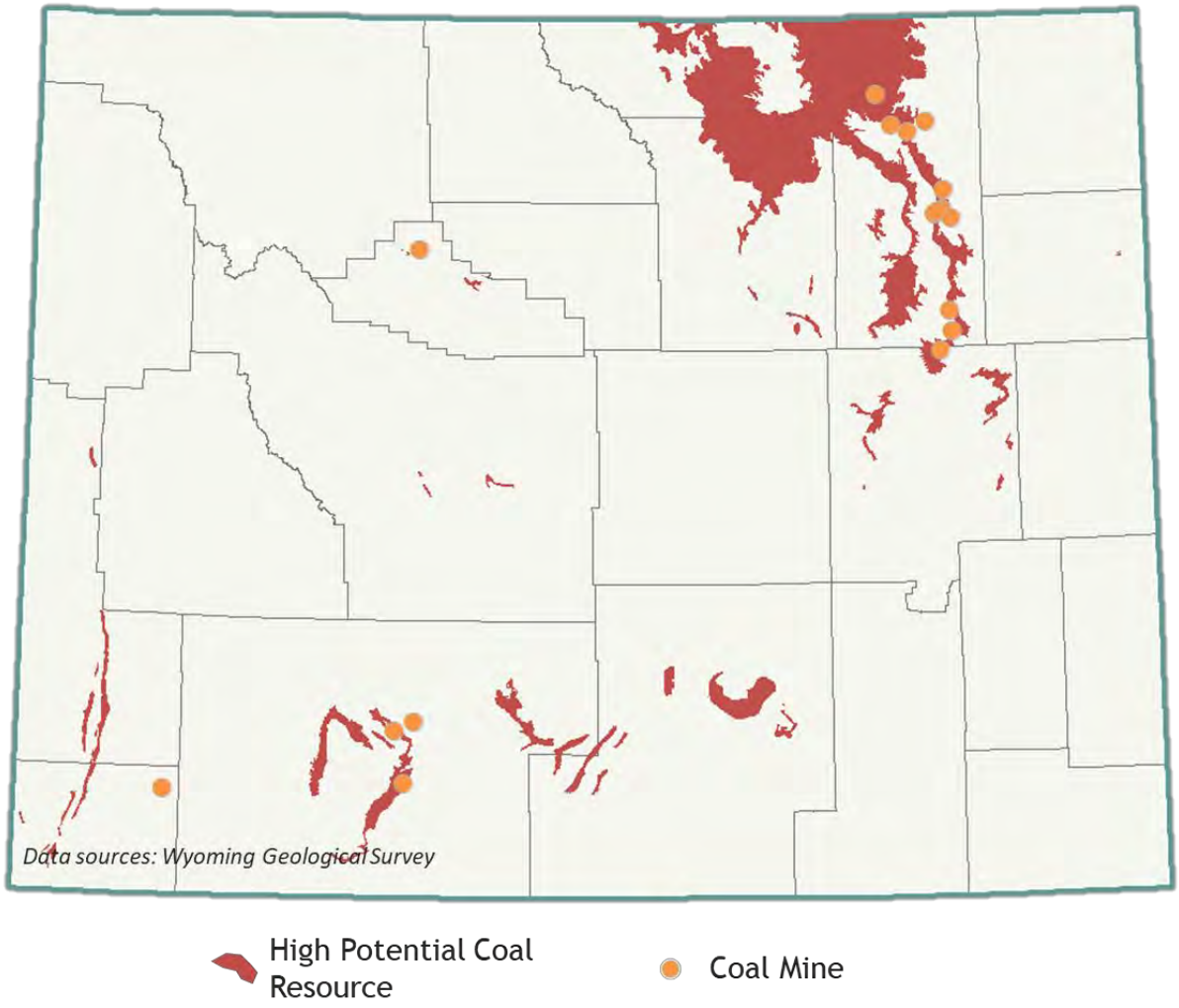
Resource

Mining, Quarrying, and Oil and Gas Extraction is driven strongly by resource. While infrastructure is an important enabler, lack thereof can often be overcome by quality resource. Therefore, the following maps, which portray Wyoming Geological Survey estimates of locations of key resources, are shown in lieu of asset intersections.

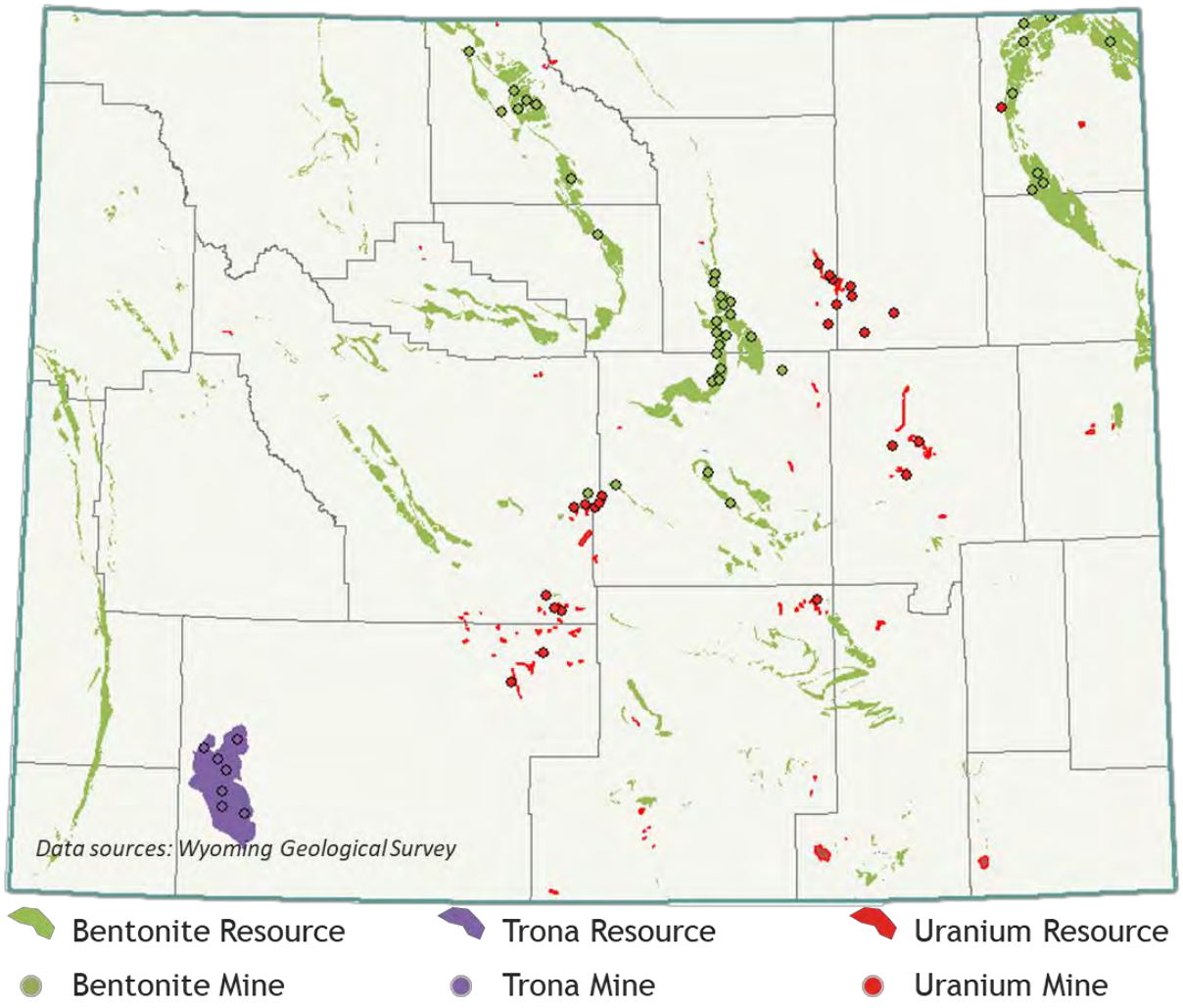
Oil and Gas



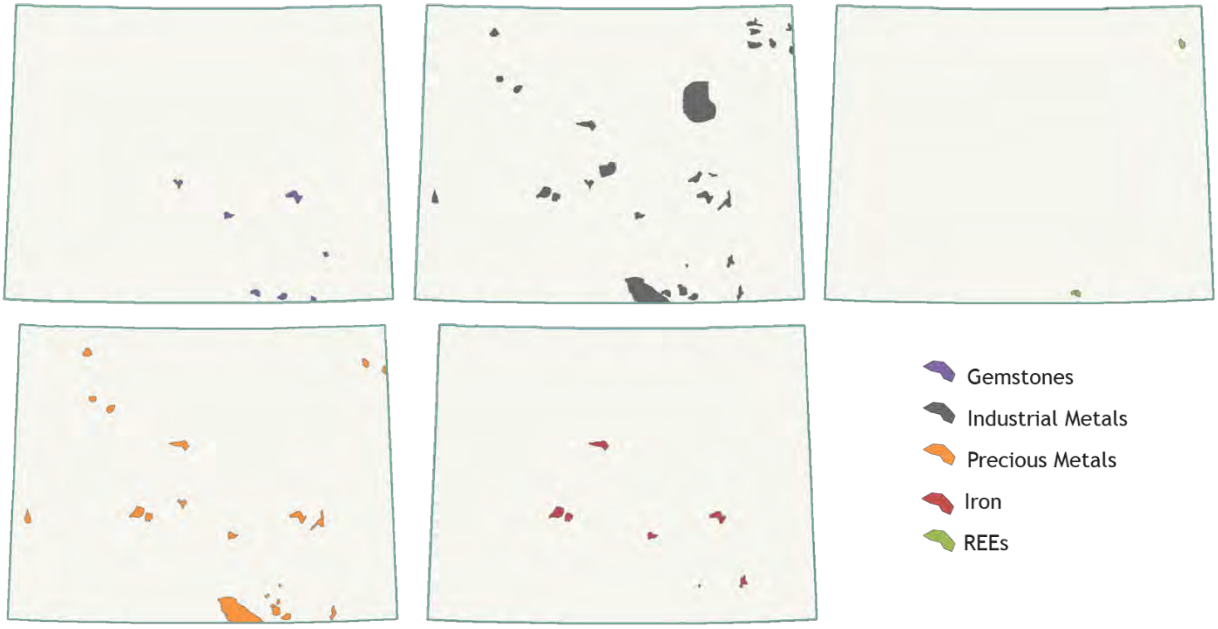
Coal


Data sources: Wyoming Geological Survey
High Potential Coal Resource
Coal Mine

Trona, Bentonite, and Uranium



Metals and Other Minerals

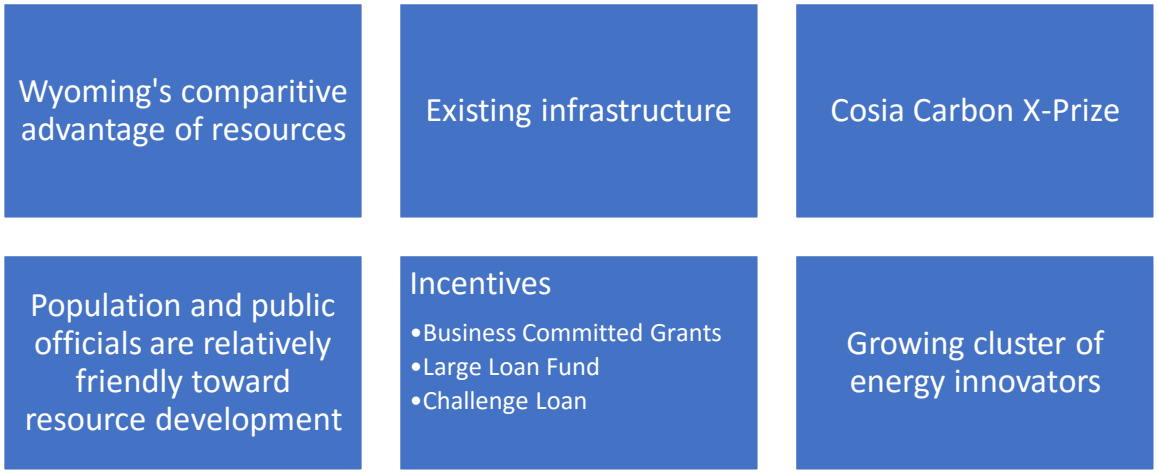


Data sources: Wyoming Geological Survey

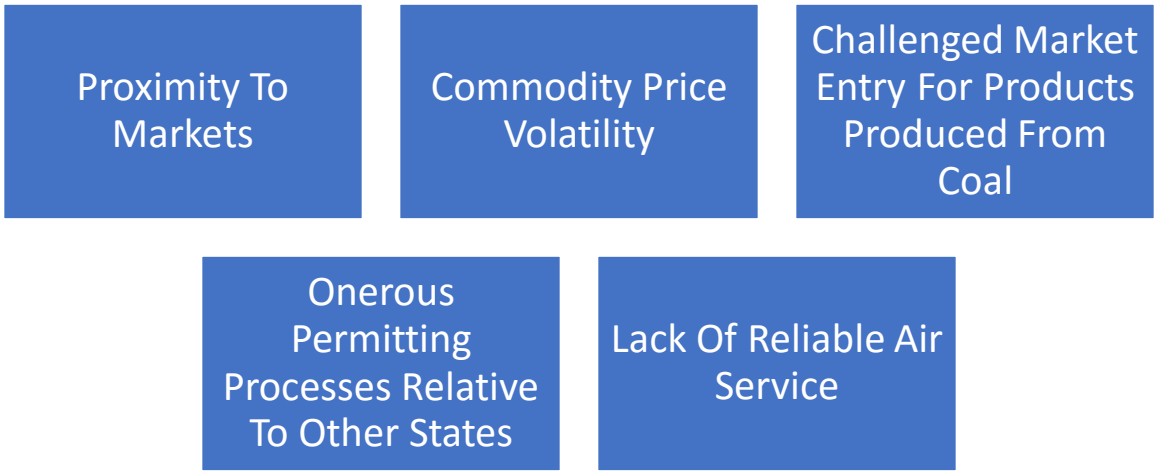
Asset Mapping Conclusions

Mining, Quarrying, and Oil and Gas Extraction is driven by resource, and enabled by infrastructure. Important crossovers amongst this sector and others—e.g. Manufacturing, Professional and Business Services—present opportunities to diversify Wyoming's economy while leveraging our rich and diverse natural resource base.

Enablers



Obstacles



State and federal regulations can add costs and delays to new or existing wells as well as affect maintenance activities associated with wells. Wyoming is 48% surface and 66% minerals federally controlled, so federal regulations are often troublesome. State and federal regulations can overlap or conflict, leaving the regulated community to wade through both sets of regulations in an attempt to comply. Without takeaway capacity, new markets are difficult to access.

Regulations with little or no environmental benefit are often not cost effective to proposed projects and can have a negative effect on existing wells. While industry

does not oppose regulations that are necessary, provide an environmental benefit and are cost effective, some regulations are passed due to pressure from outside interests, such as green groups or the public.

-Petroleum Association of Wyoming

Opportunities

Value added to minerals
- leveraging our resources to grow the downstream supply chain within Wyoming

Upstream diversification of resource and energy companies
- leveraging our UW graduates and proximity to resource to attract headquarters and R&D components of companies

CO2 capture and use

Technological advances and cost efficiencies (especially those realized in low-price environment) may improve economics of Wyoming resources

Streamlining permitting processes

High quality Wyoming basins
- geologically analogous to US onshore plays that are currently extremely highly-valued

CO2 capture and use is very beneficial for older fields that have infrastructure in place and recoverable oil resources. Use of CO2 in tertiary projects will extend the production life of older oil fields. In addition, the CO2 can be sequestered after the project is completed.

Technology advances, such as horizontal drilling and hydraulic fracturing techniques, are critical to industry. The University may be able to develop various opportunities in regards to drilling, completing or producing that will ultimately create cost savings or allow for new discoveries of natural resources. Utilizing personnel without bias against oil and gas production in Wyoming will also prove beneficial.

Pre-authorized rights-of-ways may expedite the process, but the prescheduled route may not be appropriate for every project. Accelerated permitting practices relating to rights-of-way may be more appropriately utilized.

Instances where multiple agencies share regulatory authority could be streamlined to one responsible agency. In areas that overlap state and federal authority, the state can take the lead through MOUs or some similar document.

-Petroleum Association of Wyoming

Utilities (22)

Summary of the Sector

What Businesses are in the sector?

Electric power generation/transmission/distribution, natural gas distribution, water supply and sewage treatment .

Compare to US and other states

Wyoming exceeds the national average for this sector's contribution by .9%. Financial activities contributed 2.6% to Wyoming's GDP in 2016 compared to 1.7% for the US. Above average contribution amounts to $309 million added to Wyoming's GDP.

Workforce

Wages within this sector pay above the annual mean and median for all occupations. Compared to surrounding states; North Dakota, Utah and Colorado have a higher annual average wage for this sector.

Barriers and Obstacles

Unorganized markets, regulations and taxes.

Opportunities

Increasing efficiency of existing plants, natural gas energy generation, CO2 Capture and use from gas power plants, wind energy, nuclear energy, solar energy.

Emerging Trends

- Electricity generation by coal and petroleum power plants is decreasing, nuclear has held steady and renewables and natural gas have increased.
- As changing technology and regulatory uncertainty continues to plague energy generation markets, infrastructure is aging and needs to be updated or replaced. Energy companies are very risk averse and can be reluctant to make large capital investments as they make decisions on long term factors, with the life of an asset lasting 50 or more years.
- Renewable energy sources are becoming more viable because of decreased cost, increased efficiency and increased ability to store energy for future use.

Trends

Industry Input

Even with the United States' withdrawal from the Paris Accord, individual states and cities are adopting renewable portfolio standards (RPS) and setting their own energy targets. This trend will continue and utilities will need to continue to make decisions based on a carbon-constrained energy future.

Multi-state and regional energy plans such as the Regional Greenhouse Gas Initiative (RGGI) and California's Cap and Trade program will be expanded.

Even though considerable political and governance issues remain, there will be a continued push to organize western U.S. energy markets.

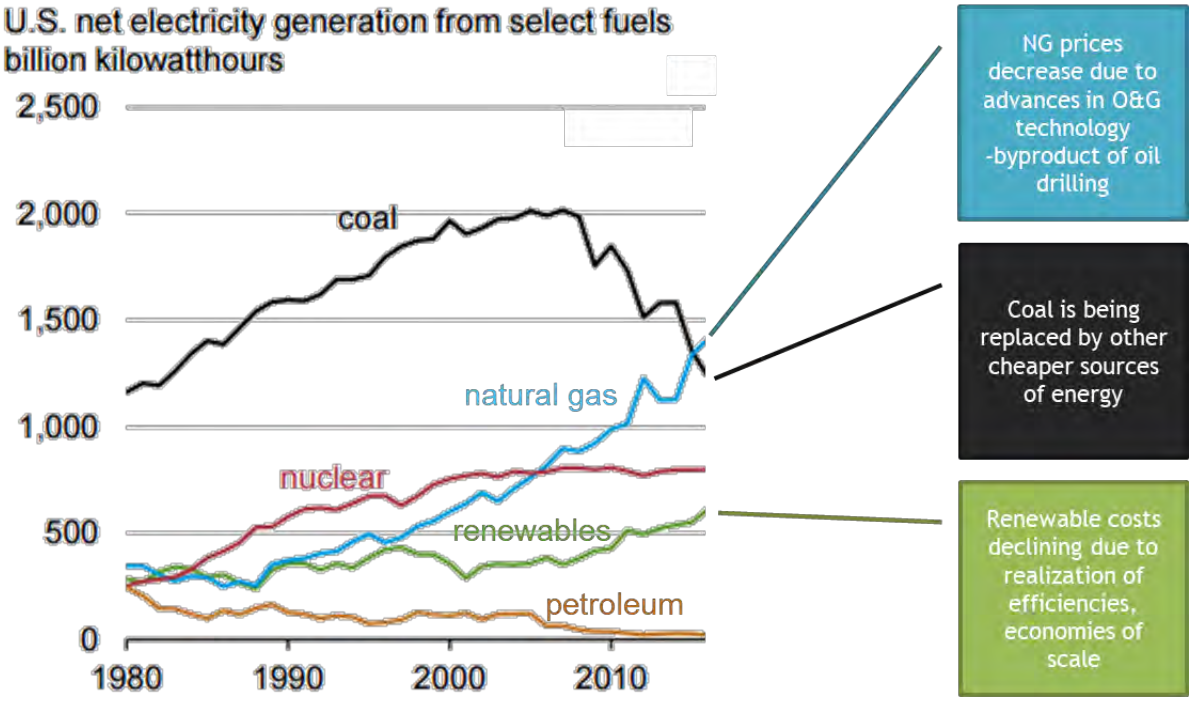
Countries are looking to balance providing reliable energy to their citizens while meeting environmental goals. While almost all nations are still involved in the Paris Accord, there are still coal-fired power plants being built across the world. There is serious interest, especially in the Asian markets, of finding solutions to their environmental targets by utilizing carbon capture technologies.

The Asian countries continue to be interested in buying Powder River Basin low-sulfur coal. WIA is actively supporting the development of coal export facilities off the West Coast of the United States to help get Wyoming coal into international markets.

There are broad differences between developed and developing countries. Most of Europe is moving away from coal, while African and Asian countries have embraced fossil energy as a pathway to provide basic electricity service. Some developed countries such as South Korea and Japan are expanding their coal fleets in a move away from nuclear power and to provide a diverse generation portfolio.

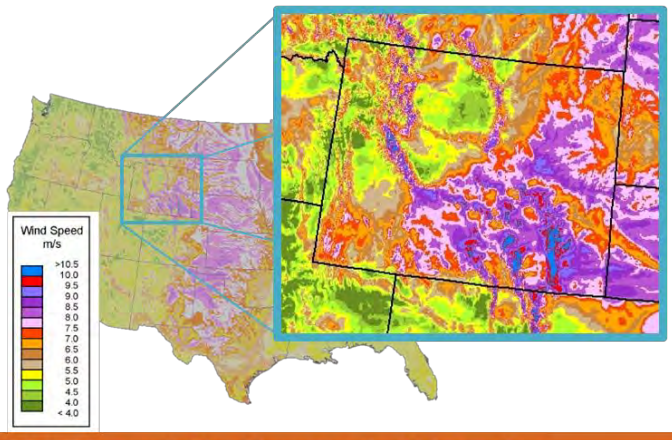
-Wyoming Infrastructure Authority

US ELECTRICITY GENERATION



Source: EIA, Annual Energy Outlook 2017

RENEWABLE ENERGY



Enablers and Challenges in Wyoming

- Excellent wind resource
- Lacking sufficient transmission
- Challenged regulatory environment compared to other states
  - BLM land and protected areas constrain development of transmission and wind projects
  - No RPS, wind tax

Renewables Trends

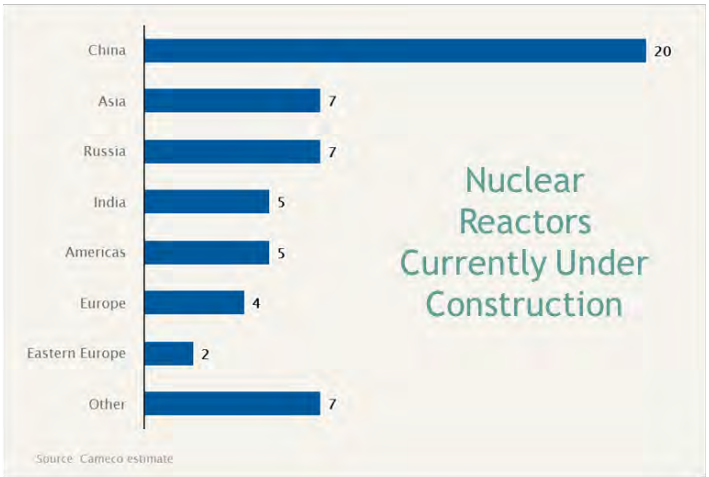
- Wind is currently cost-competitive with combined-cycle gas and coal generation, and solar may compete with wind by 2027.
- Wind energy developers are rushing to build wind projects by 2020 in anticipation of the production tax credit sunset. After that, construction is expected to decline significantly in the short term.
- Corporate PPAs are gaining importance as a method of offtake, and are expected to fill some of the predicted post-2020 gap in new wind development.

According to a Bloomberg report presented at AWEA Windpower 2017

NUCLEAR ENERGY

Wyoming is the #1 producer of Uranium in the US

Wyoming Mining Association



- Fukushima disaster caused trepidation around Nuclear energy
- Despite this, more than 100 new nuclear reactors are currently under construction around the world

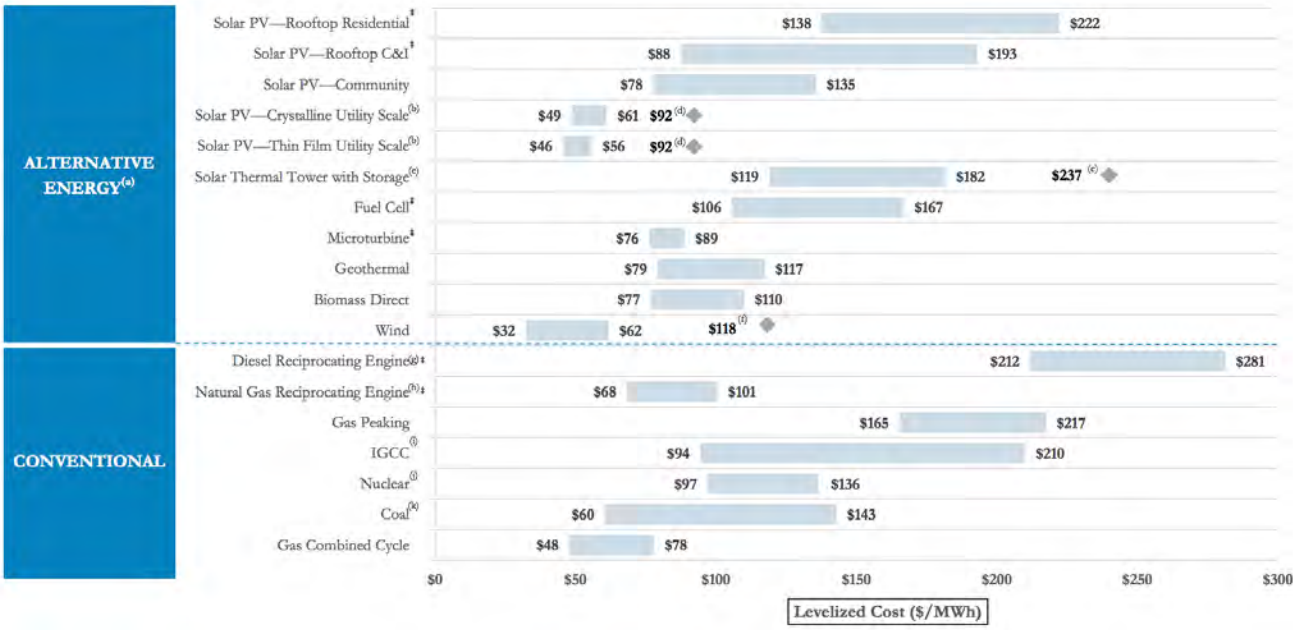
- **Coal power:** Coal power has had a tough go of it over the last decade. Low natural gas prices and increased environmental regulation — particularly the Mercury and Air Toxics Standards — have meant many coal plants were not competitive in regional markets or required costly

upgrades to operate, leading to widespread retirements. But the Clean Power Plan was put on hold by the Supreme Court last year pending legal challenges. Now, the Trump administration has promised to cancel it outright with no concrete plans for a replacement. If that happens, and a new regulatory regime is not put in place quickly, it could give remaining coal plants a new lease on life.

- **Natural gas power:** Carbon regulations get all the headlines, but whether coal power enjoys the resurgence predicted in Energy Information Administration (EIA) forecasts will depend as much on natural gas as the repeal of the Clean Power Plan. Since 2010, historically low prices for natural gas have encouraged utilities to run their gas plants more, and often at the expense of coal. Coal-to-gas switching helped natural gas surpass coal as the top U.S. generating resource last year. If those low prices continue, it could see natural gas generation increase its dominance in the U.S. power sector at the expense of other resources. In its annual energy outlook, the EIA forecasts that an increase in domestic oil and gas production would allow gas generation to widen its gap over coal and stunt growth in renewable resources.
- **Renewables:** While the trend for gas generation depends on the price of its fuel, the outlook for renewable energy is simpler — it will continue to grow because prices continue to fall. Before the extension of the investment tax credit for solar and production tax credit for wind, renewables and natural gas were expected to split U.S. capacity additions over the next few years, with wind and solar adding less than 5 GW annually until the 2020s. But after the tax extenders, the Rhodium Group forecasted that renewables would "run the table" for capacity additions, "with annual capacity additions topping out at an unprecedented 30 GWs in 2021."
- **Organized markets in flux:** If the trends for renewables and natural gas continue, it will likely mean more upheaval in the nation's organized power markets. While that has helped keep electricity prices in check for consumers, it's also made life difficult for aging baseload power plants, which have been unable to recover their fixed costs and are increasingly going offline as a result. Last summer, SNL identified 21 GW of coal, gas and nuclear generation as being "at risk" of retirement due to market conditions and aging by 2020, and nuclear lobbyists say as many as 20 nuclear plants could be threatened in the nation's organized markets.
- **Energy storage:** Long thought of as a niche resource, energy storage showed in 2016 that it can be a viable replacement for fossil fuel peaker plants, potentially setting it up for massive growth in the coming years as other resources go offline. While battery storage remains more expensive than combined cycle gas plants on average, it may be able to challenge peaker plants on price. A proposal from the Arizona consumer advocate would mandate that some renewable resources must supply power during peak demand periods, which would necessitate the use of energy storage. With a recent solar-plus-storage PPA in Hawaii coming in at $0.11/kWh, the proposal posits that solar-plus-storage could compete with those peaker plants today, supplanting carbon-emitting generation and saving consumers money.
- **Distributed Energy Resources (DER):** Change in the electric utility industry is by no means confined to the bulk power system. From rooftop solar to electric vehicles and smart thermostats, the American energy consumer is becoming more energy-savvy and increasingly demanding new generation and control technologies to give them a greater say in their energy consumption. Often, the growth of DERs has given way to policy fights, particularly on rooftop solar. Utilities in high-distributed solar regions claim that customers with rooftop systems do not pay their fair share of grid upkeep costs, while solar advocates say utilities and regulators fail to account for the benefits they provide the grid.

- **Rates:** One of the main ways utilities have sought to respond to the proliferation of DERs and stagnant load growth is through rate design reform. As customers consume less power or generate their own, utilities have sought to shore up their bottom lines by decreasing the volumetric portion of utility bills and increase the fixed portion that customers pay. Most commonly, utilities have requested increases to fixed charges or fees, either for DER customers or the entire rate bate. But consumer and DER advocates decry the changes as limiting customer control over their energy bills, and regulators have seldom awarded utilities the full fixed charge increase amounts that they request.
- **Uncertainty in Federal Policy:** Coming out of the Obama administration, the general trajectory of power sector regulation was relatively straightforward. Utilities would use gas and renewables to comply with the Clean Power Plan as the federal government supported advanced research into technologies to support deeper decarbonization. States and grid operators would work together to support the reliability of the transitioning power sector, and the whole nation would gradually move toward a less carbon-intensive energy system. Now, with the election of Donald Trump, that narrative is thrown into question. While renewables and gas are expected to continue their growth, both federal environmental regulation and clean energy supports remain in question.
- **Clean Energy Transition:** As the federal government takes a back seat on clean energy policies, proactive states are poised to take up the mantle. Already, states like California, Vermont, New York, Oregon and others are pushing ambitious clean energy standards, with Hawaii in particular targeting 100% renewables by 2045. And some are protecting existing clean generation, with deals in New York and Illinois to save ailing nuclear plants and give them extra compensation for their carbon-free attributes.
- **Reformed Business Models:** As the sector moves away from the traditional model of centralized generation, many are rethinking the utility's role to help it encourage the adoption of customer-sited resources and optimize them for the grid. Instead of the traditional cost-of-service revenue model, in which utilities petition regulators to build infrastructure for a set rate of return, many commissions are encouraging new revenue models and incentives. The New York REV docket, for instance, is testing performance-based incentives to push utilities to serve grid needs with DERs rather than building new bulk power infrastructure.

Source: http://www.utilitydive.com/news/10-trends-shaping-the-electric-utility-industry-in-2017/434541/



Natural Gas Distribution

- **Infrastructure Reliability**: With ongoing aging infrastructure concerns looming and recent high-profile gas incidents gaining media attention, safety has become more pertinent as demand for gas powered energy grows and new regulations arise. Pipelines, among other elements, must undergo strenuous safety checks to maintain standard requirements, which can be costly. With many in the industry cutting capital spending, finding resources to fund mandatory assessments has become more challenging.
- **Weather**: As natural gas's role in electricity generation increases, so do reliability challenges. Perennial reliability concerns have been revitalized as winter storms hindered power production and natural gas demand for home heating skyrocketed in early 2016. These extreme weather events further exacerbated the persistent reliability woes of the Northeast United States, which suffers from limited pipeline capacity
- **Low Price**: Low natural gas prices have pushed natural gas industry participants to find innovative ways to meet rising demand while lowering production costs. Those hoping to persevere in the current "survival of the fittest" environment must capitalize on opportunities facilitated by lower crude oil and gas prices. Economic growth in emerging markets is a critical component driving global demand for natural gas.
- **Hedging**: While a few players are maximizing production to compensate for the reduced unit price of gas, for the most part global producers are doing little or nothing to expand capacity at the time. Instead there is an enduring focus on mechanical efficiency and reliability, and organizational and product diversification. These approaches align well with the oil and gas industry's natural conservative tendencies and have strong merit. It is encouraging to see companies explore diversification models, particularly MandA activity, as a hedge against low prices cutting into the margins of their core business.
- **Pipeline Capacity**: Extreme weather events, particularly in the Northeast region of the United States, have highlighted the need for more natural gas pipeline capacity to support power

generation demand. As natural gas technology becomes a larger component of the electricity generation market, other gas consumers will likely also need to build out new infrastructure as demand increases. To serve emerging demand, survey respondents indicated that interstate pipeline laterals and interstate pipeline mainline expansions should be top priorities. However, with additional infrastructure needs, investment must follow to fund these projects.

- **Market Disconnect:** Better synchronization between the natural gas and electric markets could lead to more market transparency and enhanced reliability. During periods when gas supply and/or pipeline capacity is limited, wholesale market prices typically rise, leading to higher retail electric prices for regional consumers. Collective collaboration can help mitigate potential outages and supply interruptions. It is imperative that these industries coordinate energy planning to ensure reliability and meet forecasted demand growth.
- **Technology**: Natural gas utilities have historically enjoyed a simple and predictable relationship with their customers. The strategy to ensure positive, stable ratings is based on two easily articulated goals: deliver timely, informative and accurate bills and avoid high-profile infrastructure failures. Advanced metering infrastructure (AMI) can be an ideal investment for utilities looking to achieve both traditional and modern customer experience-driven objectives. Although its predecessor technologies, such as automatic meter reading, offer some overlapping benefits, AMI architectures deliver more comprehensive, up-to-date billing that reflects detailed actual usage. AMI also allows utilities to better monitor and maintain assets and infrastructure.
- **Regulations**: International goals and policies to address climate change are adding significant pressure and influence to fuel markets. Combined with market and regulatory forces, natural gas is experiencing a worldwide surge in both production and consumption. As growth in natural gas generation continues to surpass coal, so will its energy-associated CO2 and methane greenhouse gas emissions; these emissions are drawing increasing attention from environmental interest groups and regulatory agencies.
- **Global Market**: Demand for natural gas in Asia – specifically the key markets of China, Japan and South Korea – has slowed. Those countries are responsible for a large share of the world's global LNG import volume, but slower economic growth (particularly in China) and the restart of additional nuclear units in Japan may limit future demand. Abundant supply continues to flow from markets such as Australia and Qatar, but more diverse import markets that could theoretically benefit from that output lack the necessary LNG port, terminal and distribution infrastructure (or the assets that would fund those systems) to accommodate it. And as long as market prices remain where they were in late 2016, there is little to no incentive for organizations to invest significantly because of natural gas's low margins and return on investment – even in a competitive pricing environment for capital projects. Indonesia, Vietnam, parts of Africa and a great portion of the developing world cannot afford natural gas and are forced to rely on coal even as their governments signed on to the 2015 Paris climate agreement.

Sources:

https://www.bv.com/docs/reports-studies/sdr-natural-gas.pdf?mkt_tok=3RkMMJWWfF9wsRonuKzNZKXonjHpfsX97u0tWrHr08Yy0EZ5VunJEUWy2YIARdQ%252FcOedCQkZHblFnVUJTK28RrYNrKQM

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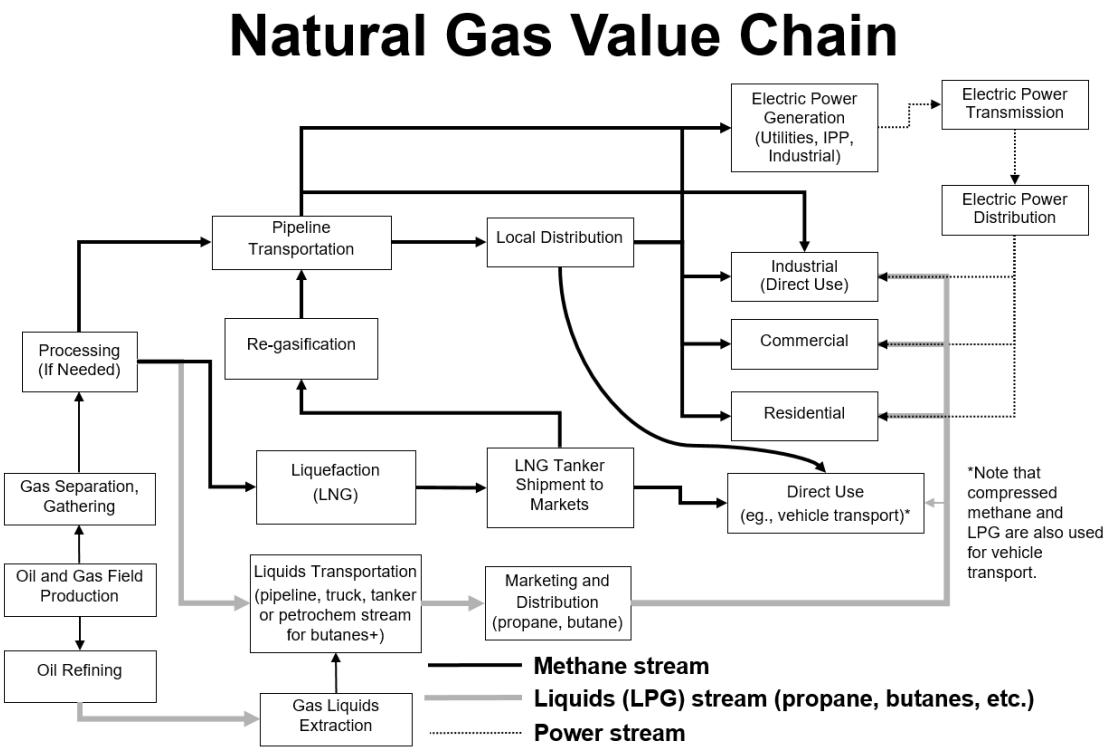
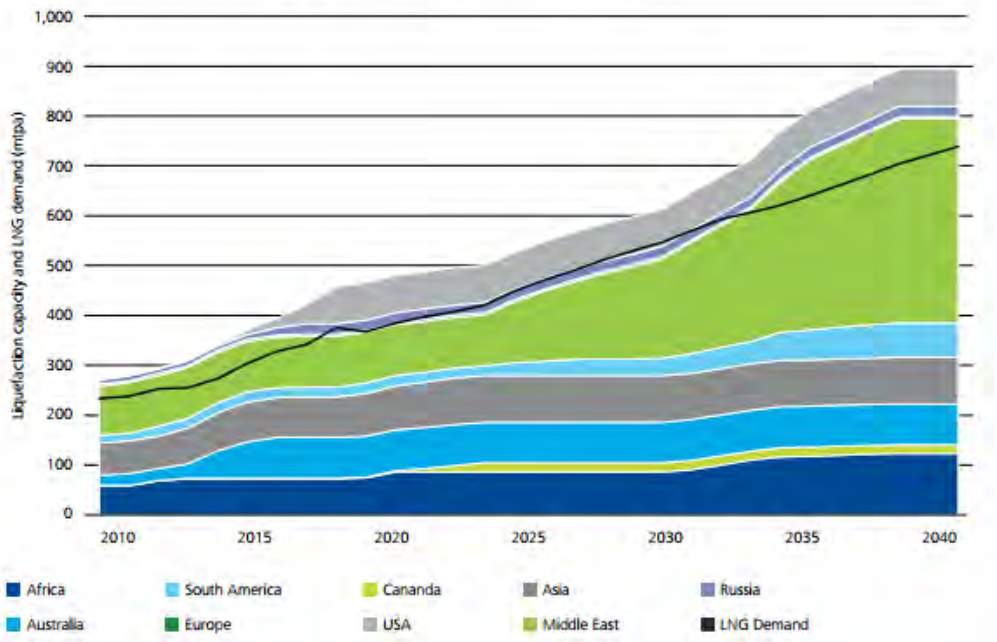


Liquified Natural Gas

- **Global economic growth:** LNG consumption is driven by global growth in Europe and Southeast Asia. A slip in regional growth, particularly in China, would flatten natural gas demand in key importing countries.
- **Energy efficiency:** Energy intensity of global growth has declined over the last few decades as high energy prices and environmental concerns have driven the adoption of higher efficiency technologies.
- **Excess capacity:** New capacity coming online in US and Australia is weighing down on an already saturated market. As few as one in twenty planned projects may be needed to meet demand through 2035 and only those with lower costs, direct access to markets, and signed buyers will move forward.
- **Shipping costs:** Shortening the trading distance with more flexible contracts and widening of the Panama Canal can reduce the cost of shipping, driving an increase in volumes as incremental margins improve. This will reduce the natural gas price differential required to drive investment.
- **New markets:** Japan and South Korea import half of all LNG volumes, historically paying a premium over shipments in the Atlantic basin. Growth in trade will require new LNG regasification facilities to be built in more countries to meet growing global fuel needs.
- **New end users:** LNG is traditionally consumed for utility-scale power generation, but LNG as an alternative transport fuel for shipping, trains, or trucks as well a power source for remote small-scale grids, will provide a long tail of potential demand growth.
- **Market liquidity:** Floating liquefaction and regasification combined with new countries building both import and export capacity, can transform the current contract-dependent market into one that provides trading opportunity through transparent gas benchmarks and a flexible spot market.

Figure 2.1 Liquefaction capacity by country and global demand 2011-2040



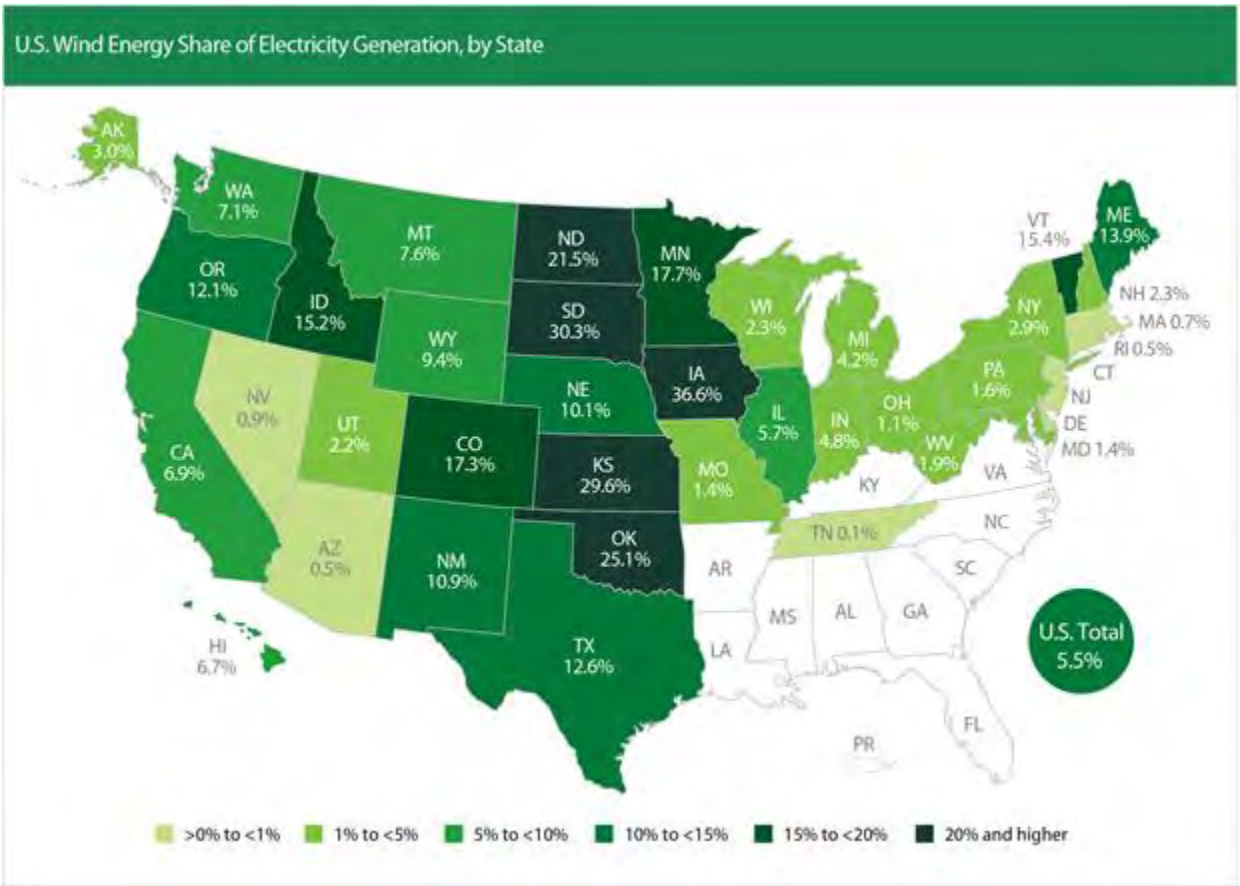
Source: https://www2.deloitte.com/us/en/pages/energy-and-resources/articles/lng-industry-trends-oil-natural-gas-report.html

Wind Energy

- **Jobs**: Strong wind construction activity throughout the year, combined with a strengthening wind manufacturing sector and growing need for personnel to operate and maintain more than 52,000 wind turbines, allowed the industry to add nearly 15,000 full-time equivalent jobs in 2016. That brings total U.S. wind industry jobs to 102,500. The U.S. wind industry added jobs more than nine times faster than the overall economy. Strong wind project installation, construction, and development activity combined with strong wind-related manufacturing activity, and over 52,000 wind turbines to operate and maintain, led wind jobs to grow 16.5 percent. That's compared to compared 1.8 percent for the overall U.S. job market.
- **Capacity**: Wind energy passed hydroelectric power to become the number one source of renewable generating capacity in 2016. With federal policy stability secured, the U.S. wind industry installed 8,203 megawatts (MW) in 2016 and the industry now has 82,143 MW installed overall, enough wind power for the equivalent of 24 million American homes.
- **Generation**: Wind energy delivered over 30 percent of the electricity produced in Iowa and South Dakota in 2016. Kansas, Oklahoma, and North Dakota generated over 20 percent of their electricity from wind, while 20 states now produce more than 5 percent of their electricity from wind energy. ERCOT, the main grid operator for most of Texas, and SPP, which operates across parts of 14 states, competed for new wind power penetration records throughout 2016, both topping 50 percent wind energy on several occasions.
- **Manufacturing**: Wind energy continues to fuel the domestic manufacturing sector, with over 500 factories across 41 states producing components for the U.S. wind industry in 2016. Domestic wind-related manufacturing jobs grew 17 percent to over 25,000 as three new factories began supplying the wind industry and five plants expanded production.
- **Technology**: Technological advances allow wind turbines to reach stronger, steadier winds, and more sophisticated control systems are increasing the amount of electricity modern wind turbines generate. Wind turbines built in 2014 and 2015 achieved capacity factors over 40 percent during 2016. At the same time, the cost of wind energy dropped over 66 percent between 2009 and 2016.
- **Utility Companies:** Fortune 500 companies, electric utilities, and others signed 47 power purchase agreements totaling more than 4,000 MW during 2016. In doing so, they cited the declining costs and stable price of wind power as factors. Utilities submitted Integrated Resource Plans detailing at least 14,000 MW in wind power additions in the past two years.
- **Projects**: 67 gigawatts of newly proposed wind projects were added to interconnection queues in 2016, the largest since the addition of 67.3 GW in 2009. This brings total wind capacity in the queues to 136.8 GW, the highest level in five years.
- **Grid**: Transmission expansion to serve wind continues, particularly in MISO and SPP. A number of proposed interregional Direct Current transmission lines have now also cleared final permitting hurdles. In total, transmission projects that could support the delivery of nearly 52,000 MW of wind energy over the next 5 years are currently under development, though not all are likely to be built.
- **State Benefits:** Over 74 percent of U.S. congressional districts have operational wind energy projects or active wind-related manufacturing facilities, including 77 percent of Republican districts and 69 percent of Democratic districts. The industry invested more than $14.1 billion in new wind projects and supported 102,500 jobs across all 50 states.
- **Emissions**: Operational wind projects avoided 393 million pounds of sulfur dioxide and 243 million pounds of nitrogen oxide. These pollutants create smog and trigger asthma attacks, so

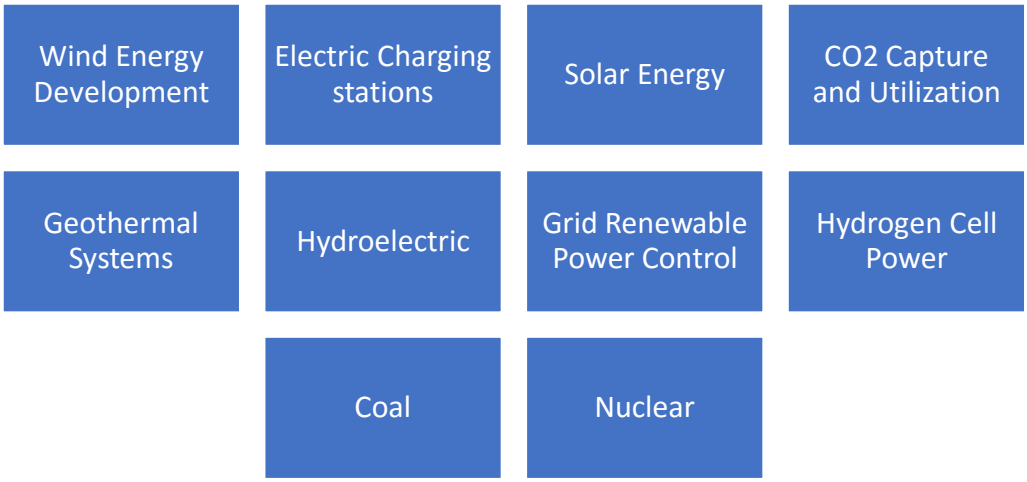
reducing them save $7.4 billion in public health costs last year. Meanwhile, operating wind projects avoided the consumption of 87 billion gallons of water, equivalent to 266 gallons per person in the U.S.

Source: http://www.aweablog.org/top-11-wind-energy-trends-2016/



Industry Focus Around the State

Communities around the state have identified the following specific focus industries within the utilities sector. This data was collected using the ENDOW Regional Assessment.

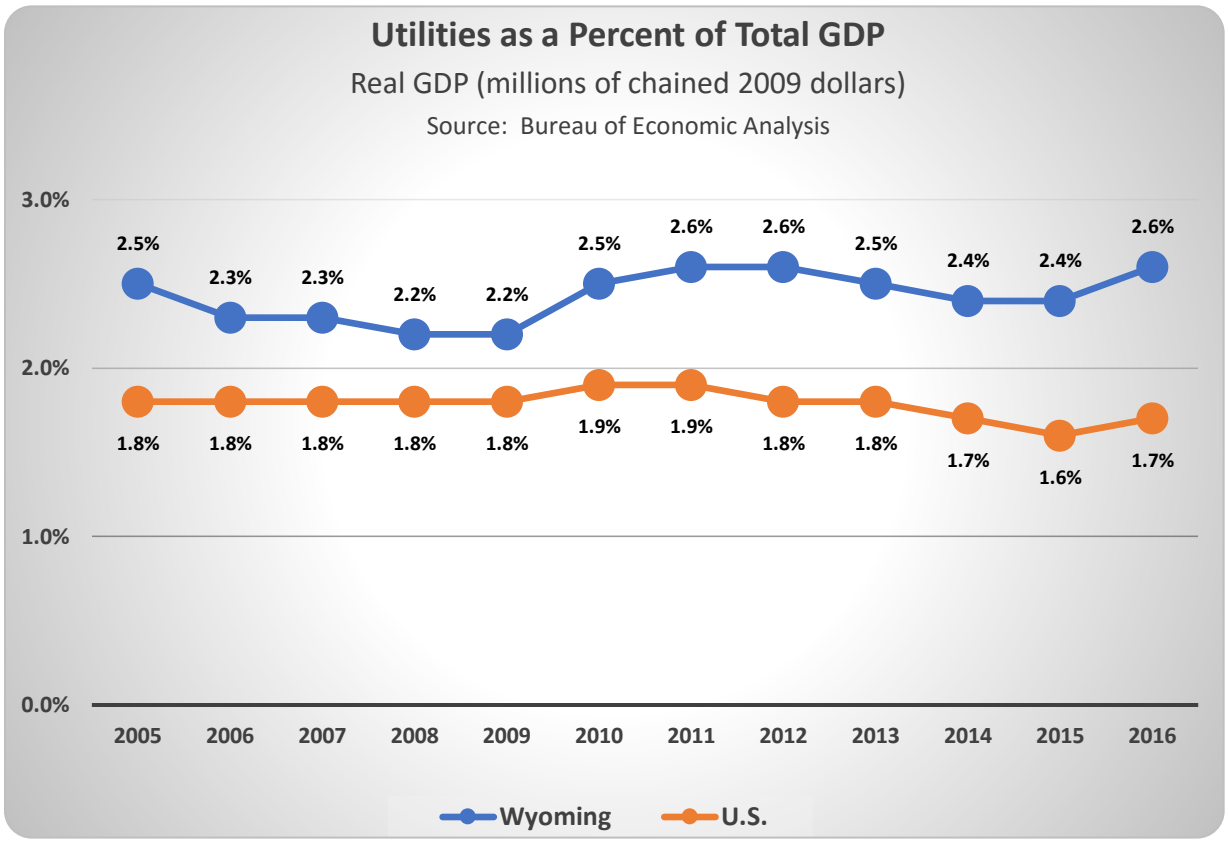


How does Wyoming compare?

WY Utilities as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Utilities	% of Total GDP
2005	$29,637	$731	2.5%
2010	$36,469	$913	2.5%
2016	$34,439	$885	2.6%

U.S. Utilities as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Utilities	% of Total GDP
2005	$14,203,241	$250,612	1.8%
2010	$14,628,165	$274,430	1.9%
2016	$16,342,925	$277,365	1.7%

Source: Bureau of Economic Analysis



Wyoming and United States Utilities Sector GDP

Real GDP (millions of chained 2009 dollars)

	2005				2010				2015			
	WY		U.S.		WY		U.S.		WY		U.S.	
Industry	GDP	% of Total Utilities GDP	GDP	% of Total Utilities GDP	GDP	% of Total Utilities GDP	GDP	% of Total Utilities GDP	GDP	% of Total Utilities GDP	GDP	% of Total Utilities GDP
Utilities	$ 731	100.0%	$ 250,612	100.0%	$ 913	100.0%	$ 274,430	100.0%	$ 858	100.0%	$ 264,359	100.0%

Source: Bureau of Economic Analysis

States with the Highest and Lowest Shares of Utilities, 2016

(as a Percentage of Their Gross State Product)

Top Five States		Bottom Five States	
Alabama	3.0%	Rhode Island	1.2%
Mississippi	3.0%	California	1.2%
West Virginia	2.9%	Utah	1.2%
North Dakota	2.9%	Washington	0.8%
Wyoming	2.6%	Tennessee	0.6%

In 2016, Wyoming ranked 5th in the nation at 2.6%

Utilities plays an important role in our national economy, accounting for roughly 1.7 percent of the United States GDP.

Percentage Utilities Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Utilities GDP	% of Total GDP
Wyoming	$885	2.6%
Alaska	$767	1.6%
Colorado	$4,272	1.5%
Idaho	$958	1.6%
Montana	$959	2.3%
New Mexico	$1,336	1.6%
North Dakota	$1,359	2.9%
South Dakota	$759	1.8%
Utah	$1,576	1.2%
United States	$277,365	1.7%

Source: Bureau of Economic Analysis

Percentage Utilities Contributes to Total Employment

2016

	Utilities Employment	% of Total Employment
Wyoming	2,542	0.9%
Alaska	2,120	0.7%
Colorado	8,240	0.3%
Idaho	3,012	0.4%
Montana	3,029	0.7%
New Mexico	4,443	0.6%
North Dakota	3,845	0.9%
South Dakota	2,020	0.5%
Utah	3,858	0.3%
United States	552,951	0.4%

Source: Bureau of Labor Statistics

Wyoming and United States Utilities Sector Establishments

	2005				2010				2016			
	WY		U.S.		WY		U.S.		WY		U.S.	
Industry	#	% of Total Utilities	#	% of Total Utilities	#	% of Total Utilities	#	% of Total Utilities	#	% of Total Utilities	#	% of Total Utilities
Utilities	98	100.0%	16,260	100.0%	121	100.0%	16,696	100.0%	130	100.0%	17,701	100.0%

Source: Bureau of Labor Statistics

Businesses in the Sector

Firms in Wyoming	
Total Firms	164
Average Age	21
Number Firms Under 5 Years Old	46
Number Firms 5-9 Years Old	32
Number Firms over 10 Years Old	86

Wyoming and United States Firms, Employees and Annual Wage (2016)

		Wyoming			United States		
NAICS Code	Industry	Firms	Employees	Annual Wages	Firms	Employees	Annual Wages
22	Utilities	130	2,542	88,326	17,701	552,951	102,870
221	Utilities	130	2,542	88,326	17,701	552,951	102,870

Workforce

Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	107	1,842	$61,312
Colorado	2005	384	7,949	$71,787
Idaho	2005	192	1,931	$53,232
Montana	2005	228	2,912	$61,492
New Mexico	2005	216	3,949	$59,772
North Dakota	2005	129	3,345	$69,052
South Dakota	2005	173	2,133	$58,774
Utah	2005	180	3,942	$70,581
Wyoming	2005	98	2,274	$67,809
US	2005	16,260	550,593	$75,207

State	Year	Firms	Employees	Annual Wage
Alaska	2010	98	2,140	$70,642
Colorado	2010	412	8,266	$84,163
Idaho	2010	214	2,730	$70,744
Montana	2010	240	3,047	$74,880
New Mexico	2010	266	4,375	$70,183
North Dakota	2010	127	3,419	$78,425
South Dakota	2010	178	2,092	$64,868
Utah	2010	193	4,064	$84,430
Wyoming	2010	121	2,484	$78,828
US	2010	16,696	551,287	$86,791

State	Year	Firms	Employees	Annual Wage
Alaska	2016	101	2,120	$85,189
Colorado	2016	401	8,240	$95,703
Idaho	2016	249	3,012	$79,834
Montana	2016	226	3,029	$86,164
New Mexico	2016	264	4,443	$78,746
North Dakota	2016	144	3,845	$96,200
South Dakota	2016	171	2,020	$78,299
Utah	2016	246	3,858	$91,221
Wyoming	2016	130	2,542	$88,361
US	2016	17,701	552,951	$102,870

Occupations in Utilities

Title	Mean Hourly	Mean Annual	Median Hourly	Median Annual
Total all occupations	$37	$77,554	$39	$80,347
Management Occupations	$58	$121,066	$56	$115,476
Top Executives	$64	$132,229	$58	$121,056
General and Operations Managers	$61	$126,868	$58	$119,991
Operations Specialties Managers	$53	$109,249	$54	$111,903
Other Management Occupations	$52	$107,640	$52	$107,823
Architectural and Engineering Managers	$55	$113,489	$54	$111,911
Business and Financial Operations Occupations	$35	$73,079	$35	$71,785
Business Operations Specialists	$35	$73,538	$35	$72,478
Purchasing Agents, Except Wholesale, Retail, and Farm Products	$32	$67,169	$34	$70,334
Cost Estimators	$39	$81,466	$41	$84,264
Financial Specialists	$34	$71,538	$33	$68,708
Accountants and Auditors	$34	$71,538	$33	$68,708
Computer and Mathematical Occupations	$37	$75,948	$37	$77,433
Computer Specialists	$37	$75,948	$37	$77,433
Architecture and Engineering Occupations	$41	$85,271	$40	$83,804
Engineers	$45	$92,653	$44	$91,669
Electrical Engineers	$44	$91,048	$43	$90,445
Drafters, Engineering, and Mapping Technicians	$30	$63,122	$30	$63,102
Surveying and Mapping Technicians	$30	$62,297	$29	$60,963
Healthcare Practitioners and Technical Occupations	$39	$80,119	$39	$81,523
Other Healthcare Practitioners and Technical Occupations	$39	$80,119	$39	$81,523
Occupational Health and Safety Specialists	$39	$80,119	$39	$81,523
Building and Grounds Cleaning and Maintenance Occupations	$13	$26,364	$13	$27,792
Building Cleaning and Pest Control Workers	$13	$26,364	$13	$27,792
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$13	$26,364	$13	$27,792
Sales and Related Occupations	$36	$74,981	$41	$85,046
Office and Administrative Support Occupations	$25	$51,915	$24	$50,914
Supervisors, Office and Administrative Support Workers	$31	$64,554	$30	$62,068
First-Line Supervisors of Office and Administrative Support Worke	$31	$64,554	$30	$62,068
Financial Clerks	$25	$51,040	$24	$49,289
Bookkeeping, Accounting, and Auditing Clerks	$24	$49,231	$23	$48,628
Information and Record Clerks	$25	$52,445	$26	$54,787
Customer Service Representatives	$25	$52,686	$27	$55,185
Material Recording, Scheduling, Dispatching, and Distributing Workers	$27	$56,282	$27	$55,533
Meter Readers, Utilities	$25	$51,663	$22	$46,257
Stock Clerks and Order Fillers	$31	$64,945	$33	$69,139

Secretaries and Administrative Assistants	$22	$44,845	$20	$42,559
Secretaries and Administrative Assistants, Except Legal, Medical,	$19	$40,172	$19	$40,203
Other Office and Administrative Support Workers	$23	$47,296	$21	$43,648
Office Clerks, General	$23	$47,296	$21	$43,648
Construction and Extraction Occupations	$38	$78,493	$39	$81,288
Construction Trades Workers	$38	$78,265	$40	$82,374
Installation, Maintenance, and Repair Occupations	$38	$79,303	$41	$85,213
Supervisors of Installation, Maintenance, and Repair Workers	$44	$92,542	$45	$93,026
First-Line Supervisors of Mechanics, Installers, and Repairers	$44	$92,542	$45	$93,026
Electrical and Electronic Equipment Mechanics, Installers, and Repairers	$40	$83,750	$42	$87,768
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	$39	$82,011	$40	$84,120
Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	$40	$83,171	$42	$86,383
Other Installation, Maintenance, and Repair Occupations	$37	$77,047	$40	$83,455
Control and Valve Installers and Repairers, Except Mechanical Door	$34	$70,789	$35	$73,733
Electrical Power-Line Installers and Repairers	$39	$80,292	$40	$83,710
Production Occupations	$39	$80,335	$40	$82,348
Supervisors, Production Workers	$43	$89,577	$46	$95,345
First-Line Supervisors of Production and Operating Workers	$43	$89,577	$46	$95,345
Plant and System Operators	$37	$76,989	$37	$77,876
Power Distributors and Dispatchers	$46	$95,257	$46	$95,527
Power Plant Operators	$38	$78,238	$37	$77,066
Water and Wastewater Treatment Plant and System Operators	$26	$54,182	$23	$47,345
Transportation and Material Moving Occupations	$28	$57,506	$28	$58,995
Material Moving Workers	$28	$58,282	$29	$59,426
Laborers and Freight, Stock, and Material Movers, Hand	$28	$58,282	$29	$59,426

Exports

No international exports from Wyoming, according to US Import and Export Trade Statistics

Asset Maps

A baseline for delineating Business Development and Innovation Zones

Wind energy, natural gas energy, solar energy, small-scale nuclear energy, and CO2 capture and use have been identified as opportunities within the utilities sector. While asset maps here are focused on

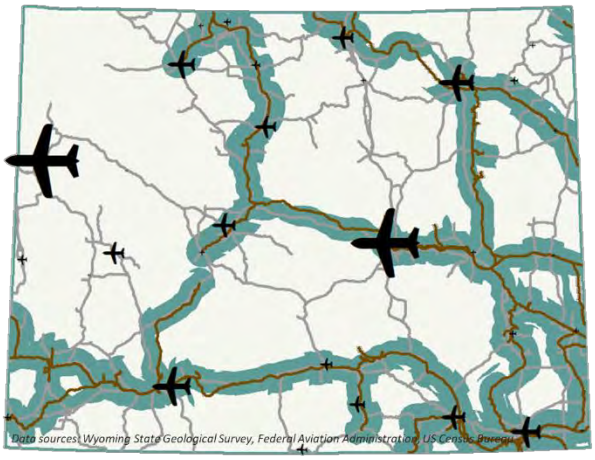
these, assets of companies within the utilities sector are required for many other sectors, and are represented in those sectors as well.

Mappable Sector Assets

Wind Energy | Natural Gas Energy |Solar Energy |Small-Scale Nuclear |CO_2 Capture and Use

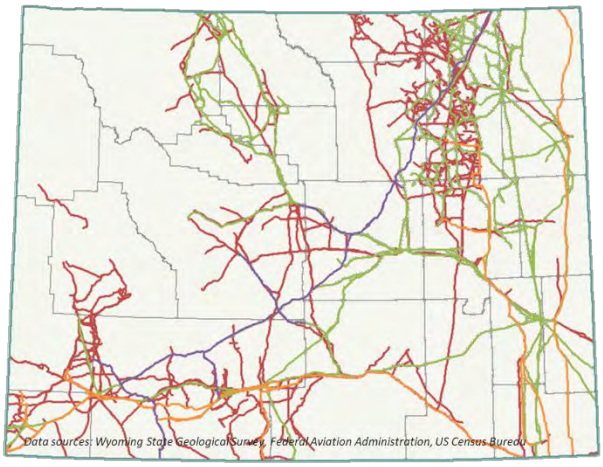
Infrastructure	Resource
•Transportation •Rail •Road •Transmission Capacity •Pipelines •Gas •Oil •NGL •CO_2 •Developable Land	•Wind •Natural Gas •Uranium •CO_2 Generation •CO_2 Sinks

Infrastructure



Railroads
Highways
Near Railroad and Highway
Airports
commercial, taxi, and commuter operations per week
1
10
100

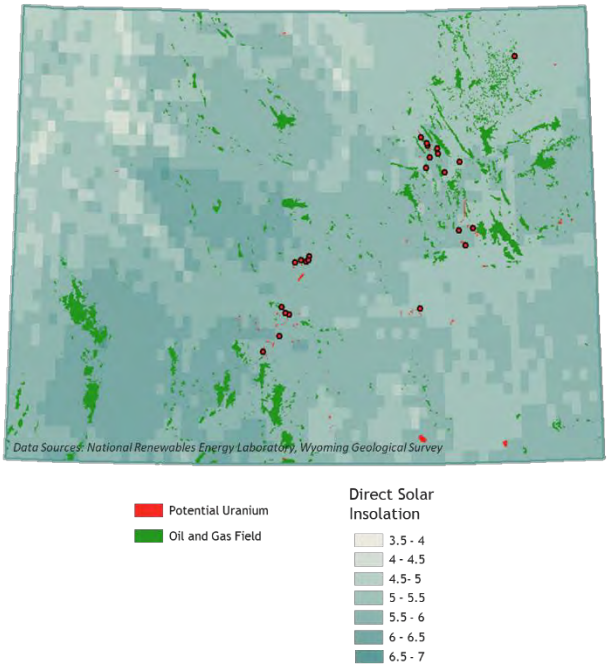
Transmission Lines
Proposed Transmission Lines
Power Generation
Coal
Diesel
Hydro
Natural Gas
Wind

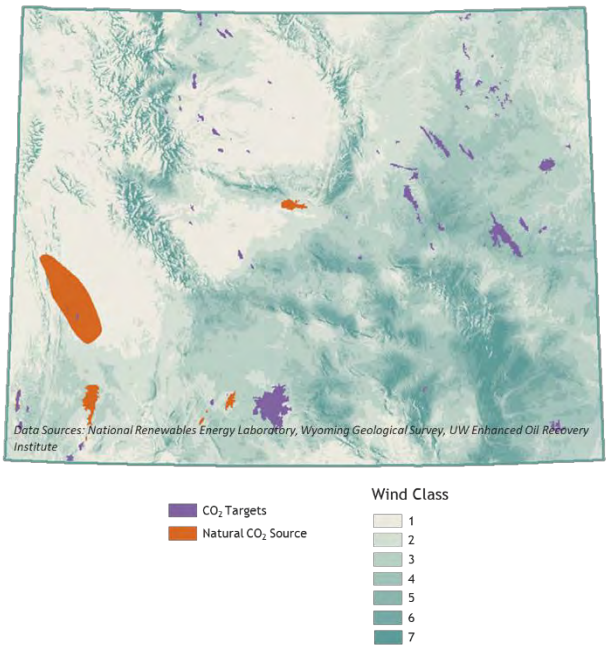


CO_2
Natural Gas Liquid
Natural Gas
Crude Oil

National Park/Forest
Sage Grouse Core Area
Critical Habitat USFWS

Resource

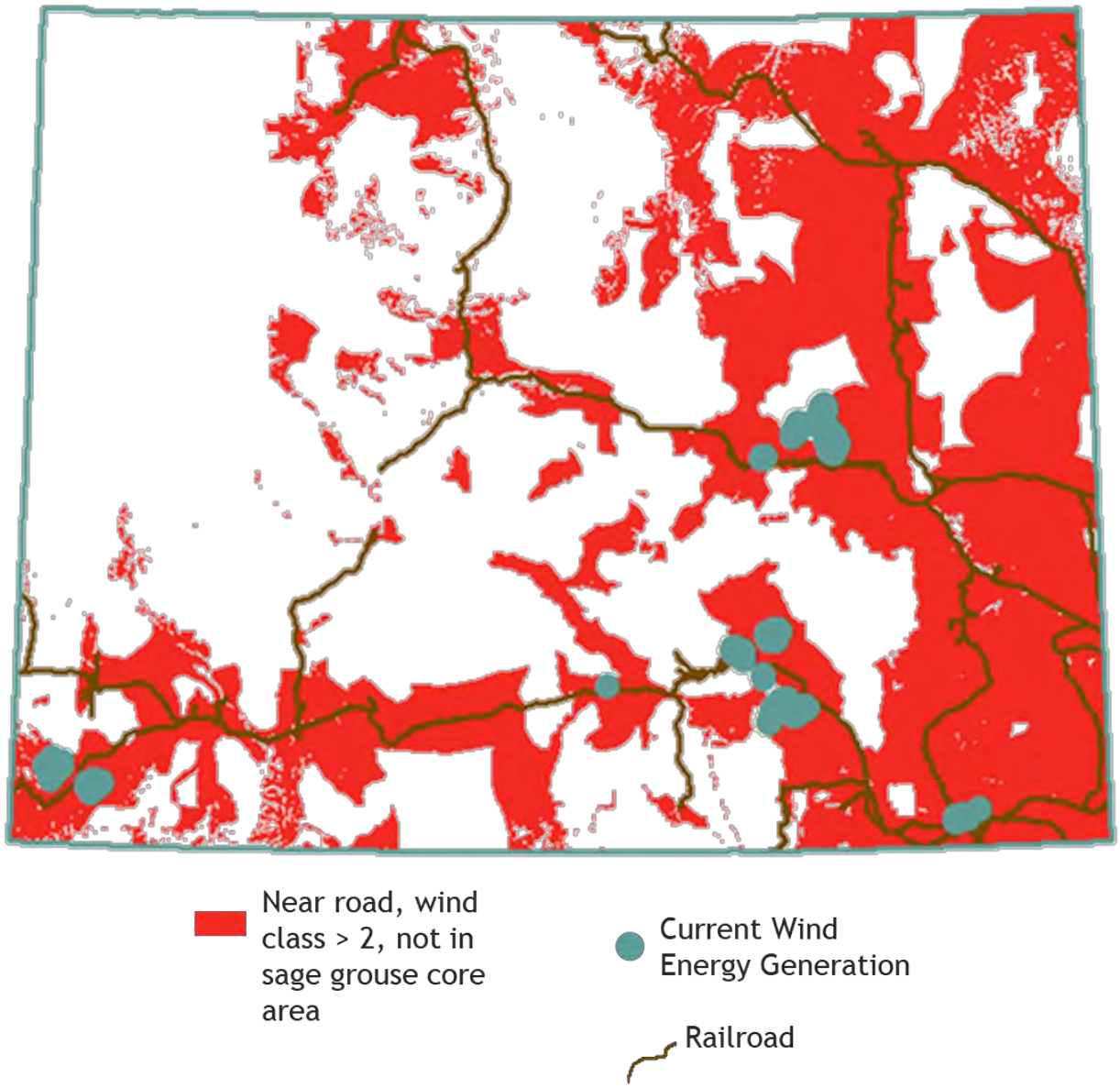


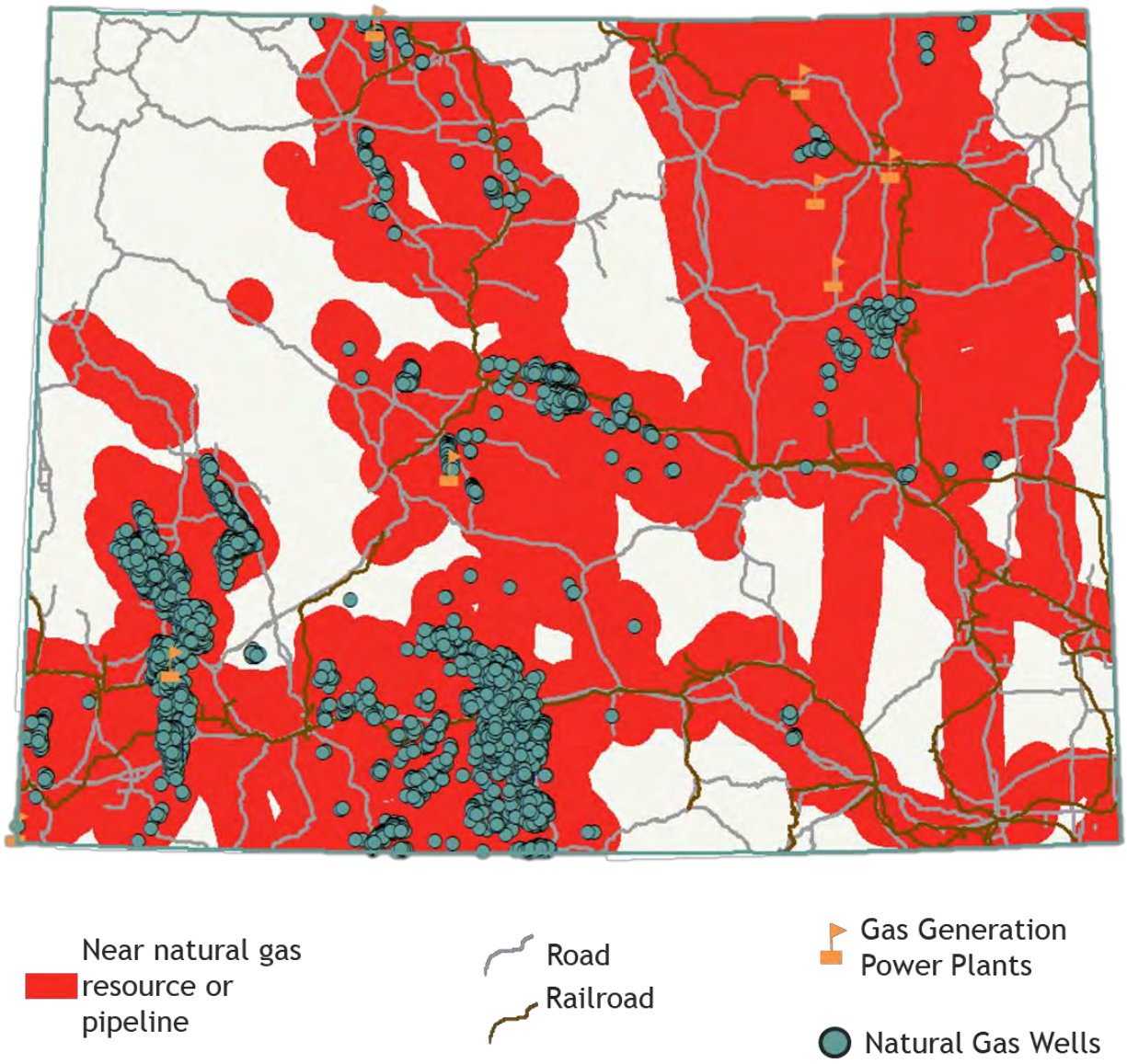


Industry Asset Intersections

Intersections shown below are contingent on transmission capacity, which is challenged in much of the state. Sites within these areas, areas characterized by one or more input assets, or intersections amongst sectors may be considered potential business development and innovation zones. More focused analyses will be presented in the report submitted to the Legislature and Governor before December 31st, 2017.

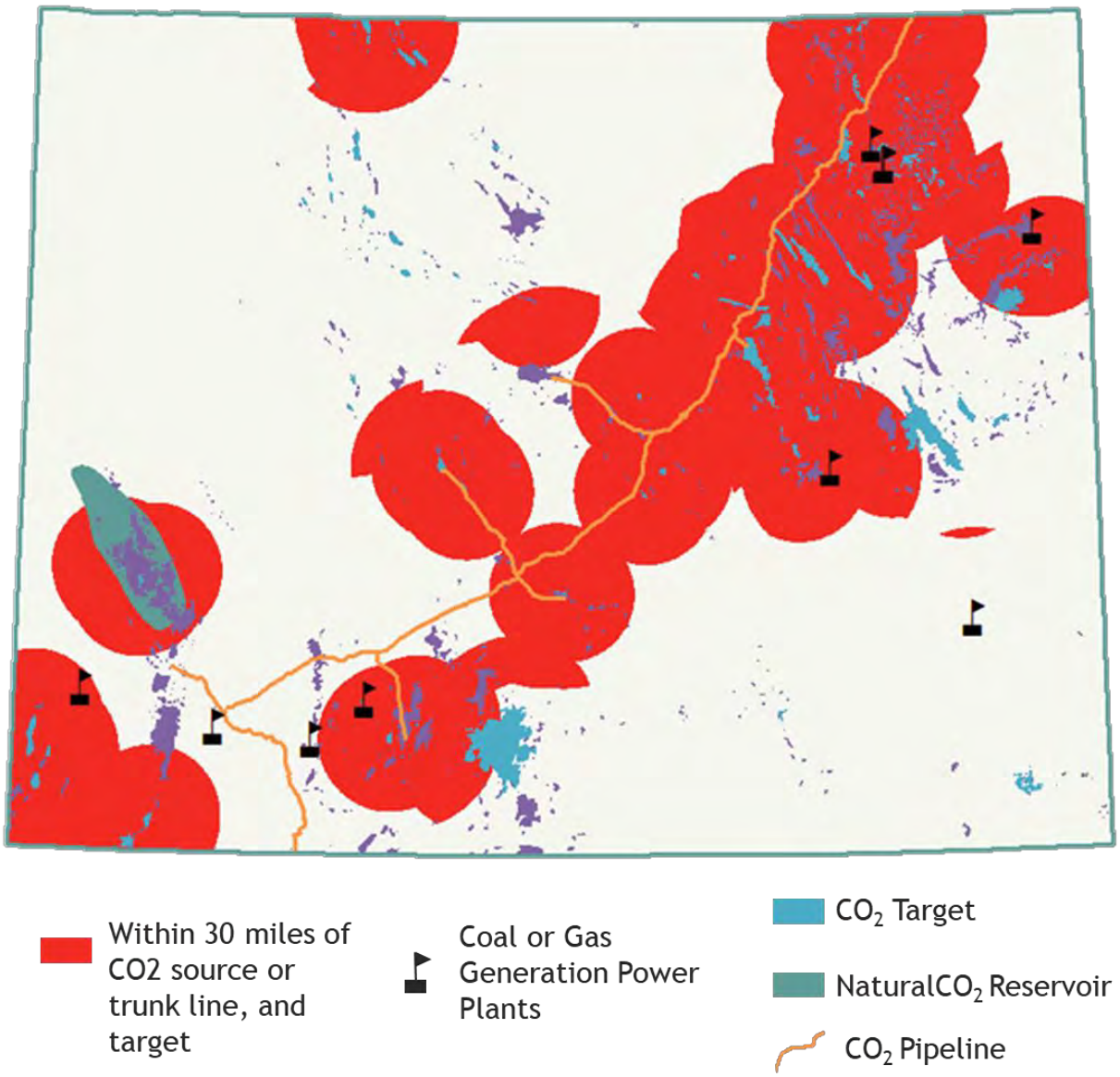
Utility-Scale Wind Generation



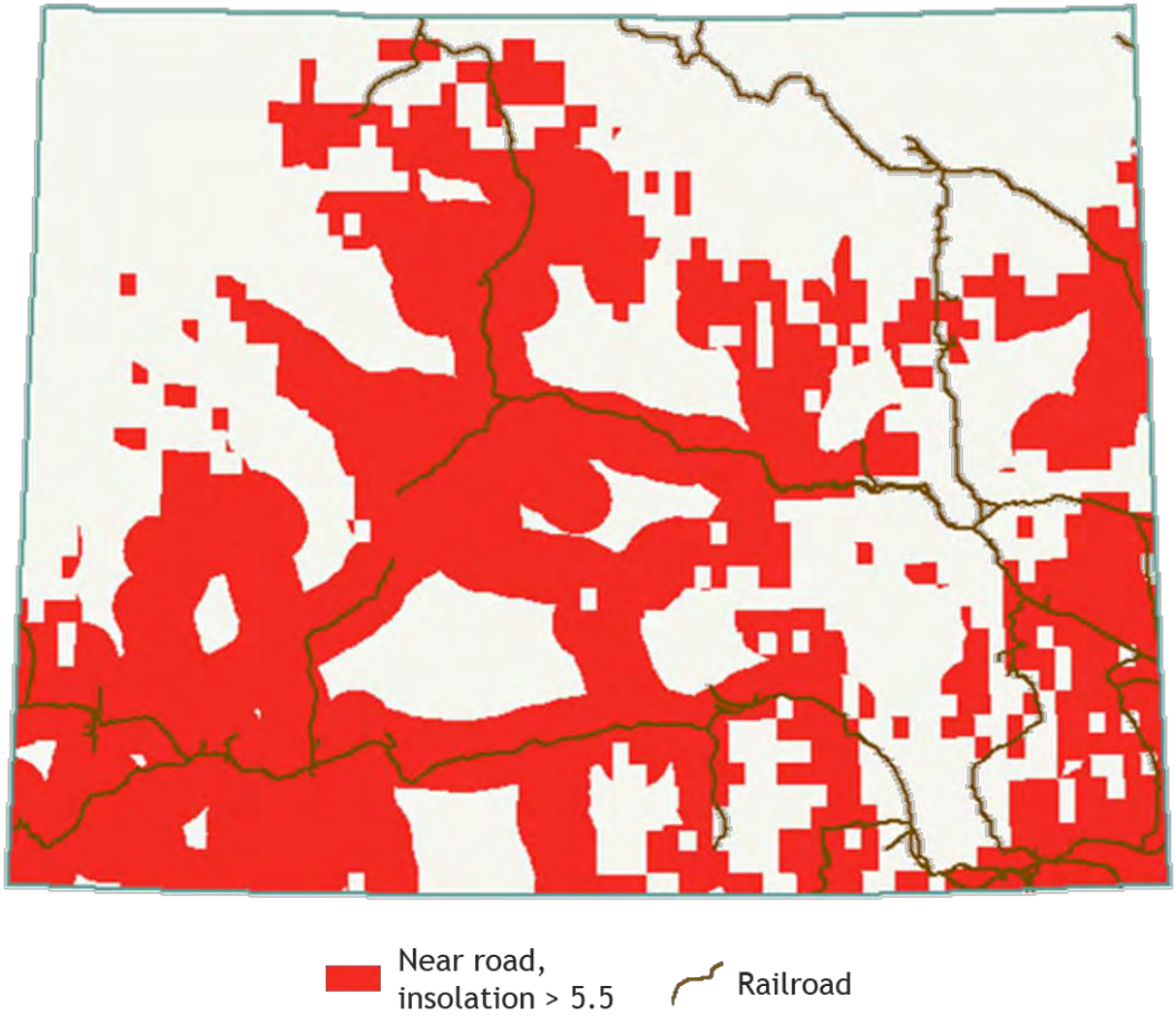

Near natural gas resource or pipeline
Road
Railroad
Gas Generation Power Plants
Natural Gas Wells

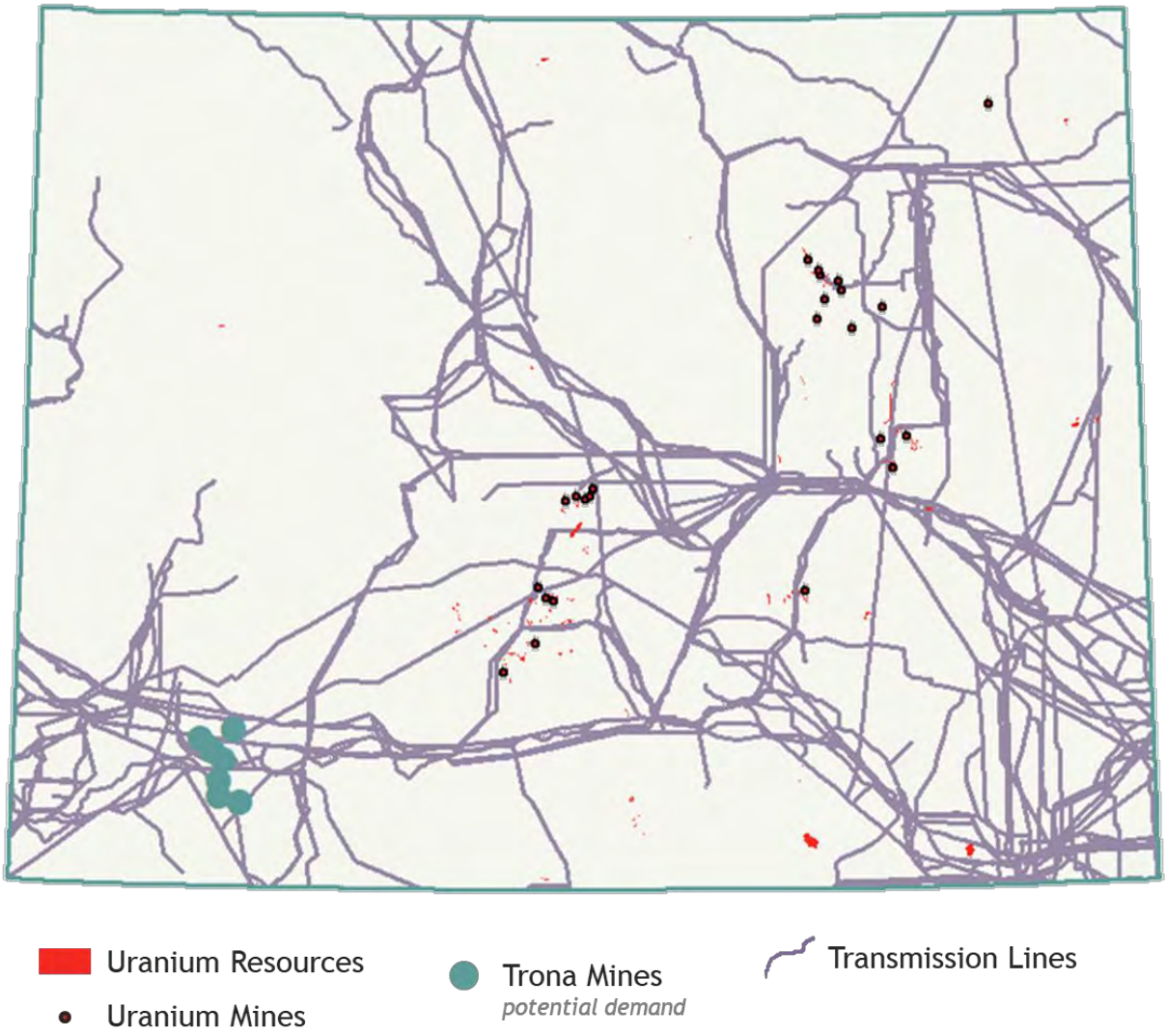
CO2 Capture and Use

CO2 Capture and use involves capturing CO2 from a source such as a coal or natural gas power generation plant, and injecting it into oil and gas reservoirs (CO2 target reservoirs) to enhance recovery.



Solar Energy Generation





Asset Mapping Conclusions

Utilities intersections are driven by resource and transmission. Wyoming is fortunate to have a very robust and diverse resource base. However, energy generation is contingent on transmission capacity and offtake, which is somewhat challenged currently in Wyoming.

Enablers

Abundance of world class energy resources

Industry Input

Wyoming Integrated Test Center

Governor Mead's pipeline corridor initiatives

University of Wyoming (Carbon Research Institute, Enhanced Oil Recovery Institute, School of Energy Resources)

Wyoming independence from regional transmission organizations

Uranium: With the large amount of uranium in the state, is there an opportunity to develop nuclear testing facilities similar to what is being done with coal?

-Wyoming Infrastructure Authority

Obstacles

Relatively high tax climate (wind)

Lack of transmission capacity

Industry Input

Permitting Process and Timeline

Unorganized Markets (Transmission)

Uncertain Regulations and Taxes

-Wyoming Infrastructure Authority

Opportunities

Industry Input

What opportunities do you see to grow this sector Wyoming?

Carbon Capture Utilization and Sequestration (CCUS) and creating a carbon asset economy

Proven track record of streamlining processes

-Wyoming Infrastructure Authority

Wind energy generation

Natural gas energy generation

Nuclear energy

Small-scale nuclear energy

Solar Energy

CO2 Capture and Use

s

Construction (23)

Summary of Sector

What Businesses are in the sector?

Residential building construction, building equipment contractors, specialty trade contractors, affordable housing, ag infrastructure upgrades, construction machinery.

Compare to US and other states

Wyoming is significantly ahead of the US average and on par with many surrounding states in this industry. Activities in this sector contributed 5.1% to Wyoming's GDP in 2016 compared to 4.0% for the US. Wyoming is .8 percentage points ahead of South Dakota and about a half a percentage point or less behind surrounding states Colorado, Idaho and Montana. Utah leads the northern Rocky Mountain region at 6.0%. In 2016, Wyoming ranked 8th nationally for construction as a percentage of gross state product.

Workforce

Wyoming wages within this sector pay better than the mean and median for all occupations. In Wyoming, however, wages are less than the US average, but pay more than surrounding states Colorado, Idaho, Montana, New Mexico and South Dakota.

Barriers and obstacles

Lack of reliable job base in sufficient numbers for building more homes for first-time home buyers.

Lack of appraisers in some of the smaller rural areas, and there is a problem with replacing them.

Increased government regulation, as mid-size companies find it challenging to manage the costs of compliance.

Significant out-of-state competition.

Lack of skilled workforce/limited workforce – negative view of construction trades in favor of higher education with a limited return on investment.

Opportunities

Encourage politicians to eliminate overlapping government regulations, outdated regulations, and discourage the implementation of new regulations.

Increase high school recruiting efforts at national level, and provide funding to bring back industrial arts programs.

Emerging Trends

· Collaborative approaches for projects.

· Labor shortages.

· Offsite/modular construction.

· Sustainable construction.

· Rising construction costs.

· Increased legal action and prosecution for safety violations and incidents amid a building boom.

· Technology – use of augmented reality and virtual reality.

Trends

Industry Input

Collaborative Delivery Methods:

Collaborative approaches for projects may be gaining ground nationally, but we don't see that trend as much in Wyoming, as these delivery methods are more geared to larger companies and projects, which are the exception rather than the rule in Wyoming. These collaborative delivery methods will freeze out smaller companies if not handled correctly.

Labor Shortages:

Both skilled and unskilled labor shortages is a major concern for all Wyoming construction firms and throughout the country.

Offsite/Modular Construction:

We would be surprised to see this trend in more than a limited way in Wyoming. In most commercial work there are not enough patterns of repetition to make this cost effective.

Construction Costs:

Increased material costs do not significantly affect our margins, as these costs are passed on to the end user. We are affected by the labor shortage, and we are definitely impacted by federal regulations which continue to place more and more liability on the contractor. In a small business, each person must wear multiple hats, and we cannot maintain compliance with these burdensome regulations with the personnel resources we currently have.

Sustainable Construction:

Sustainable building drives up building costs. We have built to LEED certification and green building methods only to find the owner had to later add costly ventilation because the building was so airtight. If there is truly value in sustainable building it should be market driven.

Legal Action and Prosecution:

We absolutely agree that the construction industry continues to face increased scrutiny for safety violations and incidents. As in previously mentioned federal regulations, this again requires more people, more training, driving up costs. If you check our Worker's Compensation cases, there are none that reflect an unsafe job site. It is not politically correct to say this, but we repeatedly see employee focus and

performance directly affected by drinking, drugs, personal and family problems that plague them, constant cell phone use, and playing video games till the wee hours of the morning – all of which dull their ability to wake up, think, focus.

Technology:

There is some truth to this and it can be a valuable tool, but we don't see it as a fix all. In the construction industry perhaps there is not as much impact in the near future as for other industries. There are still the onsite challenges in the physical construction of the project, with the same issues of conflict in drawings, design, and constructability, etc. We have installed air systems and smart boards in schools that could be considered overdesigned when their operation is a challenge for teachers and maintenance personnel to understand. Those in the industry with the years of building knowledge and experience are not adapting as quickly as the younger generation. As a general contractor, we end up providing project specified technology compliance not only for ourselves, but for many of our subcontractors, who are skilled tradesmen, not IT people.

Industry will be seeing impacts to the standard transportation by autonomous vehicles.

-Wyoming Contractors Association

In the current Wyoming economy, tightening construction markets may trend more towards cost based selection processes such as design-bid-build, as owners are more focused on up front project costs.

In the long term, as the state's economy improves, and owner's focus shifts more to value, the usage of collaborative, qualifications based processes will likely increase.

Construction nationwide, as well as in Wyoming is seeing employees leave and retire from the industry at a greater rate than they can be replaced.

In addition, the current decline of building construction in Wyoming is resulting in layoffs. Often, when employees are laid off, they leave the state, unlikely to return, making it more difficult and expensive for contractors to build their workforce when the economy improves.

While a number of construction materials are currently at lower prices than we have seen in recent years, those prices are increasing as building picks up across the nation. If international construction increases, especially in China and southern Asia, material prices could spike quickly.

-Wyoming Construction Coalition, Inc.

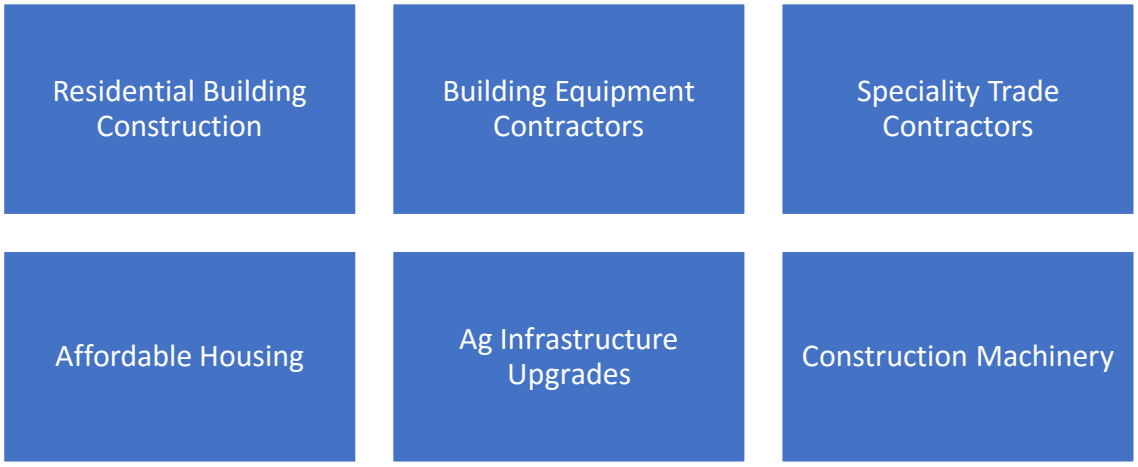
- **Collaborative delivery methods:** The days of design-bid-build domination might be winding down, as experts expect collaborative approaches to become more common for projects. Design-build, public-private partnerships, and integrated project delivery are three of the most often-cited methods that are altering the industry and are likely to gain ground in 2017.
- **Labor shortage:** One trend that the industry hoped would fade away is, instead, raging on. The skilled labor shortage is a major concern for firms across the U.S. as employers struggle to staff their job sites.
- **Offsite/Modular Construction:** Experts predict that offsite construction will continue to grow in 2017 as quality, time, and labor concerns make alternatives to traditional construction methods more attractive.
- **Construction Costs:** One of the most common concerns industry experts cited for 2017 is the escalating cost of doing business. With rising material and labor costs, firms will likely struggle to maintain their margins.
- **Sustainable construction**: The incoming Trump administration has implications beyond infrastructure, as sustainable building leaders are now considering the possibility of altering their messaging to ensure the movement continues.
- **Legal Action and Prosecution:** The construction industry continues to face increased scrutiny for safety violations and incidents amid a building boom. Experts predict that 2017 will see continued heightened attention to job site safety from agencies and law enforcement.
- **Technology**: The use of augmented reality and virtual reality allows for breakthrough. Augmented reality will carve its way onto the job site by providing data and visual cues for certain personnel, while virtual reality will find its home amongst architects and key stakeholders for real time collaboration. Drones have been very useful for surveying construction sites and monitoring worker progress.

Source: https://candelsoncall.com/6-construction-industry-trends-2017/

Source: http://www.constructiondive.com/news/construction-industry-trends-2017/433151/

Industry Focus Around the State

Communities around the state have identified the following specific focus industries within the construction sector. This data was collected using the ENDOW Regional Assessment.

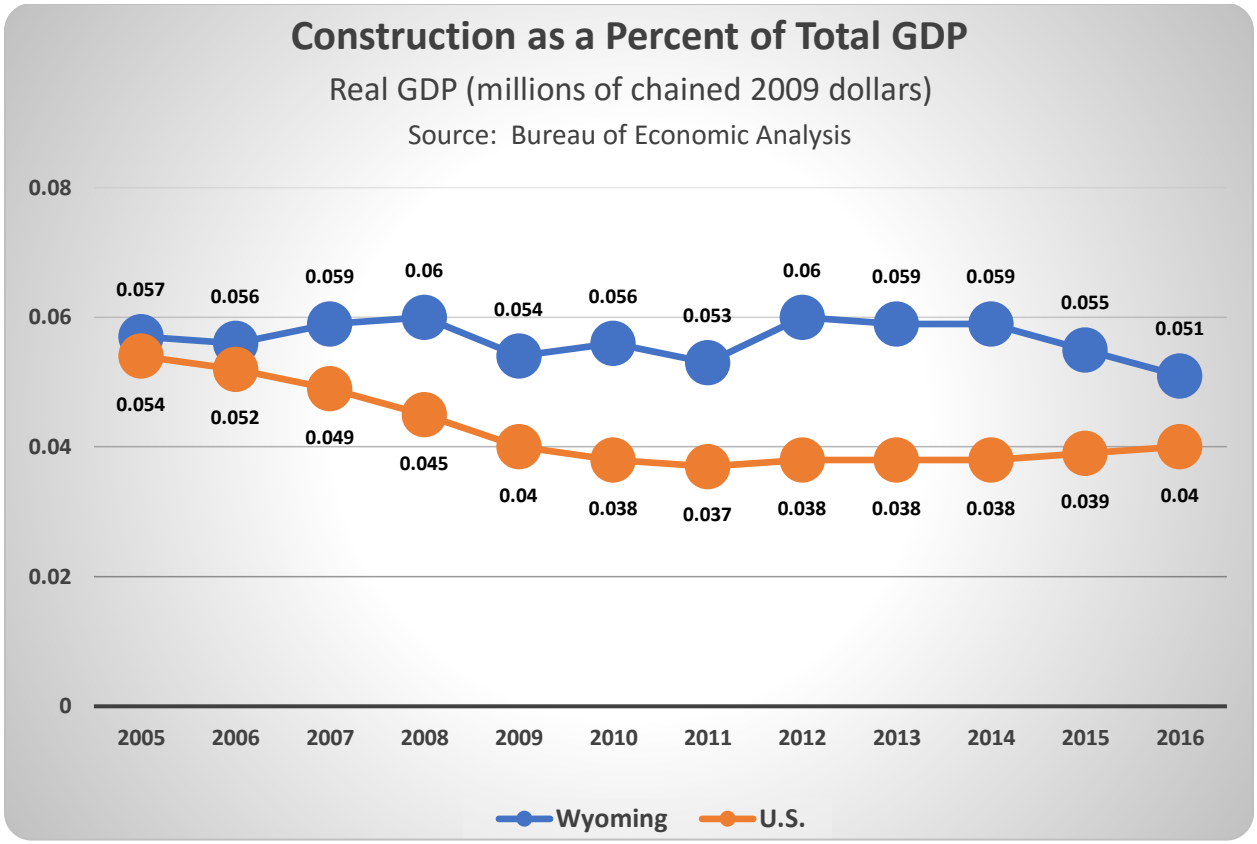


How does Wyoming compare?

WY Construction as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Construction	% of Total GDP
2005	$29,637	$1,677	5.7%
2010	$36,469	$2,054	5.6%
2016	$34,439	$1,753	5.1%

U.S. Construction as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Construction	% of Total GDP
2005	$14,203,241	$772,756	5.4%
2010	$14,628,165	$551,604	3.8%
2016	$16,342,925	$645,697	4.0%

Source: Bureau of Economic Analysis



Wyoming's Construction GDP is currently 1.1% over that of the US.

Wyoming and United States Construction Sector GDP

Real GDP (millions of chained 2009 dollars)

	2005				2010			
Industry	WY		U.S.		WY		U.S.	
	GDP	% of Total Construction GDP	GDP	% of Total Construction GDP	GDP	% of Total Construction GDP	GDP	% of Total Construction GDP
Construction	$ 1,677	100.0%	$ 772,756	100.0%	$ 2,054	100.0%	$ 551,604	100.0%

	2015			
Industry	WY		U.S.	
	GDP	% of Total Construction GDP	GDP	% of Total Construction GDP
Construction	$ 1,981	100.0%	$ 623,855	100.0%

Source: Bureau of Economic Analysis

States with the Highest and Lowest Shares of Construction, 2016

(as a Percentage of Their Gross State Product)

Top Five States		Bottom Five States	
North Dakota	6.9%	Nebraska	3.4%
Utah	6.0%	New Mexico	3.3%
Hawaii	5.9%	New York	3.1%
Idaho	5.7%	New Hampshire	3.1%
Montana	5.6%	Connecticut	3.0%

In 2016, Wyoming ranked 8th in the nation at 5.1%

Construction plays an important role in our national economy, accounting for roughly 4.0 percent of the United States GDP.

Percentage Construction Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Construction GDP	% of Total GDP
Wyoming	$1,753	5.1%
Alaska	$1,650	3.5%
Colorado	$15,360	5.3%
Idaho	$3,387	5.7%
Montana	$2,315	5.6%
New Mexico	$2,851	3.3%
North Dakota	$3,278	6.9%
South Dakota	$1,794	4.3%
Utah	$8,176	6.0%
United States	$645,697	4.0%

Source: Bureau of Economic Analysis

Percentage Construction Contributes to Total Employment

2016

	Construction Employment	% of Total Employment
Wyoming	21,105	7.8%
Alaska	16,219	5.0%
Colorado	155,209	6.1%
Idaho	39,452	5.7%
Montana	27,030	5.9%
New Mexico	43,218	5.4%
North Dakota	31,069	7.4%
South Dakota	22,799	5.4%
Utah	91,564	6.6%
United States	6,683,748	4.7%

Source: Bureau of Labor Statistics

Wyoming and United States Construction Sector Establishments

	2005				2010			
Industry	**WY**		**U.S.**		**WY**		**U.S.**	
Construction	**#**	**% of Total Construction**	**#**	**% of Total Construction**	**#**	**% of Total Construction**	**#**	**% of Total Construction**
Construction of Buildings	992	28.7%	257,102	30.4%	1014	26.9%	235,775	29.7%
Heavy and Civil Engineering Construction	451	13.1%	56,945	6.7%	521	13.8%	52,888	6.7%
Specialty Trade Contractors	2,012	58.3%	531,796	62.9%	2,232	59.3%	504,011	63.6%
Source: Bureau of Labor Statistics								

	2016			
Industry	**WY**		**U.S.**	
Construction	**#**	**% of Total Construction**	**#**	**% of Total Construction**
Construction of Buildings	903	26.0%	233,097	30.1%
Heavy and Civil Engineering Construction	469	13.5%	50,509	6.5%
Specialty Trade Contractors	2100	60.5%	491,947	63.4%
Source: Bureau of Labor Statistics				

Businesses in the Sector

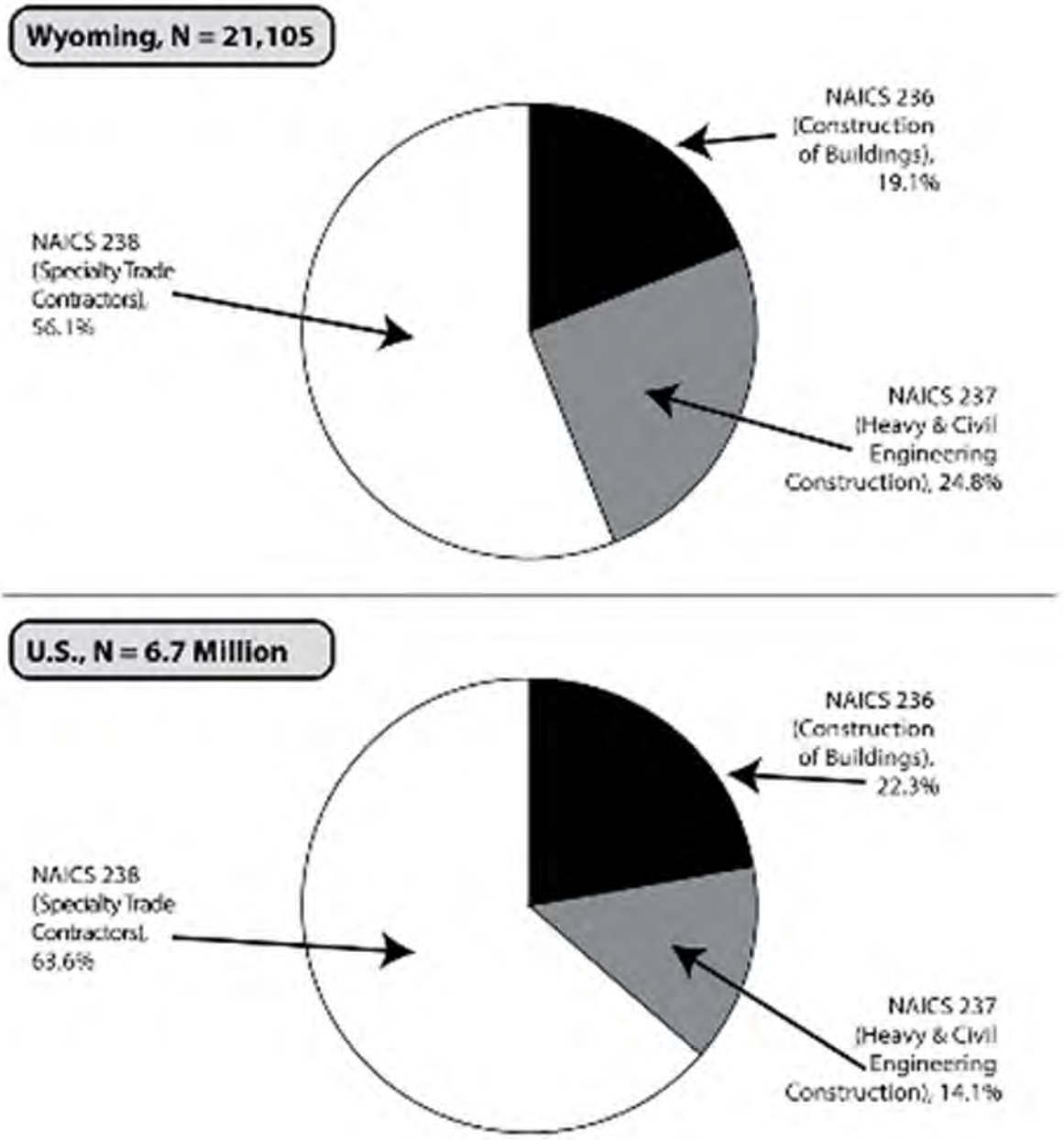
Firms in Wyoming	
Total Firms	3,787
Average Age	9
Number Firms Under 5 Years Old	1,615
Number Firms 5-9 Years Old	827
Number Firms over 10 Years Old	1,345

Wyoming and United States Firms, Employees and Annual Wage (2016)

		Wyoming			United States		
NAICS Code	Industry	Firms	Employees	Annual Wages	Firms	Employees	Annual Wages
23	Construction	3,472	21,105	50,338	775,552	6,683,748	58,642
236	Construction of buildings	903	4,039	45,680	233,097	1,487,641	63,859
237	Heavy and civil engineering construction	469	5,226	61,372	50,509	943,561	70,048
238	Specialty trade contractors	2,100	11,839	47,052	491,947	4,252,547	54,287

NAICS* 23: Construction

Distribution of Jobs by 3-Digit NAICS Code in Wyoming and the U.S., 2016 Annual Average



*North American Industry Classification System.
Source: Quarterly Census of Employment and Wages, U.S. Bureau of Labor Statistics.
Prepared by T. Glover and M. Moore, Research & Planning, WY DWS, 7/21/17.

Workforce

Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	2,608	18,486	$55,760
Colorado	2005	21,430	160,101	$41,487
Idaho	2005	8,423	45,152	$32,064
Montana	2005	5,551	27,565	$33,992
New Mexico	2005	6,068	54,356	$33,046
North Dakota	2005	2,882	17,222	$35,703
South Dakota	2005	3,577	21,004	$31,758
Utah	2005	12,007	81,685	$32,334
Wyoming	2005	3,454	20,762	$35,331
US	2005	845,843	7,269,317	$42,100

State	Year	Firms	Employees	Annual Wage
Alaska	2010	2,441	15,995	$70,391
Colorado	2010	18,943	115,110	$47,826
Idaho	2010	7,818	31,218	$38,152
Montana	2010	5,654	22,670	$40,892
New Mexico	2010	5,984	43,832	$40,616
North Dakota	2010	3,035	21,222	$46,535
South Dakota	2010	3,647	20,108	$38,110
Utah	2010	10,198	65,224	$42,088
Wyoming	2010	3,766	22,352	$47,640
US	2010	792,674	5,489,499	$49,597

State	Year	Firms	Employees	Annual Wage
Alaska	2016	2,492	16,219	$77,661
Colorado	2016	18,438	155,209	$57,339
Idaho	2016	7,205	39,452	$41,618
Montana	2016	5,833	27,030	$48,659
New Mexico	2016	5,213	43,218	$44,375
North Dakota	2016	4,205	31,069	$64,284
South Dakota	2016	3,847	22,799	$47,677
Utah	2016	10,457	91,564	$47,478
Wyoming	2016	3,472	21,105	$50,340
US	2016	775,552	6,683,748	$58,642

Occupations in Construction

Title	Mean Hourly	Mean Annual	Median Hourly	Median Annual
Total all occupations	$23	$48,144	$21	$43,879
Management Occupations	$53	$109,618	$44	$91,807
Top Executives	$56	$117,498	$47	$96,864
General and Operations Managers	$56	$117,026	$46	$96,697
Operations Specialties Managers	$43	$88,447	$44	$91,212
Financial Managers	$43	$89,765	$44	$92,032
Other Management Occupations	$49	$101,022	$42	$87,674
Construction Managers	$48	$100,729	$42	$87,171
Business and Financial Operations Occupations	$32	$67,109	$31	$63,757
Business Operations Specialists	$32	$65,912	$31	$63,617
Purchasing Agents, Except Wholesale, Retail, and Farm Products	$26	$54,128	$25	$51,364
Cost Estimators	$32	$67,124	$32	$66,889
Human Resources Specialists	$27	$55,122	$22	$46,748
Financial Specialists	$34	$71,013	$31	$63,980
Accountants and Auditors	$34	$71,013	$31	$63,980
Computer and Mathematical Occupations	$25	$52,662	$25	$51,705
Computer Specialists	$25	$52,662	$25	$51,705
Computer Programmers	$24	$48,870	$19	$38,677
Network and Computer Systems Administrators	$29	$61,074	$30	$61,771
Architecture and Engineering Occupations	$33	$68,127	$32	$65,748
Engineers	$35	$73,432	$34	$70,879
Civil Engineers	$34	$71,345	$34	$70,383
Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	$34	$70,213	$34	$71,347
Drafters, Engineering, and Mapping Technicians	$20	$42,327	$20	$41,656
Healthcare Practitioners and Technical Occupations	$24	$48,894	$21	$44,326
Other Healthcare Practitioners and Technical Occupations	$24	$48,894	$21	$44,326
Occupational Health and Safety Specialists	$29	$60,861	$29	$59,897
Occupational Health and Safety Technicians	$17	$36,236	$17	$36,096
Building and Grounds Cleaning and Maintenance Occupations	$16	$32,299	$14	$28,481
Building Cleaning and Pest Control Workers	$16	$32,276	$14	$28,103

Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$14	$28,602	$13	$26,430
Sales and Related Occupations	$34	$69,905	$28	$57,431
Sales Representatives, Services	$38	$79,093	$26	$55,010
Sales Representatives, Services, All Other	$38	$79,093	$26	$55,010
Sales Representatives, Wholesale and Manufacturing	$27	$57,165	$27	$56,259
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	$26	$53,652	$27	$56,051
Other Sales and Related Workers	$39	$80,143	$35	$73,480
Office and Administrative Support Occupations	$18	$37,609	$17	$36,262
Supervisors, Office and Administrative Support Workers	$25	$51,979	$24	$50,409
First-Line Supervisors of Office and Administrative Support Worke	$25	$51,979	$24	$50,409
Financial Clerks	$20	$40,947	$19	$38,677
Billing and Posting Clerks and Machine Operators	$18	$36,428	$17	$35,683
Bookkeeping, Accounting, and Auditing Clerks	$20	$40,885	$18	$38,406
Payroll and Timekeeping Clerks	$21	$43,858	$21	$43,215
Information and Record Clerks	$15	$31,885	$14	$29,231
Receptionists and Information Clerks	$14	$29,438	$14	$28,560
Material Recording, Scheduling, Dispatching, and Distributing Workers	$17	$34,744	$15	$31,898
Stock Clerks and Order Fillers	$15	$31,634	$14	$28,929
Secretaries and Administrative Assistants	$17	$34,651	$16	$33,737
Executive Secretaries and Executive Administrative Assistants	$28	$58,912	$24	$49,889
Secretaries and Administrative Assistants, Except Legal, Medical,	$16	$33,389	$16	$33,161
Other Office and Administrative Support Workers	$18	$37,003	$17	$36,121
Office Clerks, General	$18	$37,074	$17	$36,229
Construction and Extraction Occupations	$22	$46,149	$21	$43,406
Supervisors, Construction and Extraction Workers	$31	$64,794	$29	$61,084
First-Line Supervisors of Construction Trades and Extraction Work	$31	$64,794	$29	$61,084
Construction Trades Workers	$22	$44,904	$20	$42,582

Boilermakers	$32	$67,356	$34	$69,773
Brickmasons and Blockmasons	$26	$54,562	$26	$54,862
Carpenters	$23	$47,330	$22	$46,179
Carpet Installers	$13	$27,873	$12	$25,085
Floor Sanders and Finishers	$16	$32,690	$15	$30,478
Tile and Marble Setters	$23	$47,682	$19	$38,923
Cement Masons and Concrete Finishers	$19	$40,390	$19	$39,114
Construction Laborers	$17	$34,412	$16	$34,309
Paving, Surfacing, and Tamping Equipment Operators	$20	$41,172	$19	$40,186
Operating Engineers and Other Construction Equipment Operators	$23	$47,454	$23	$46,912
Drywall and Ceiling Tile Installers	$22	$45,962	$22	$46,092
Electricians	$26	$54,181	$27	$55,340
Glaziers	$20	$42,023	$19	$38,988
Insulation Workers, Floor, Ceiling, and Wall	$18	$36,806	$17	$36,168
Insulation Workers, Mechanical	$20	$41,274	$19	$38,647
Painters, Construction and Maintenance	$18	$37,578	$18	$37,076
Pipelayers	$17	$34,960	$17	$34,497
Plumbers, Pipefitters, and Steamfitters	$23	$48,406	$23	$47,872
Roofers	$18	$37,273	$15	$31,792
Sheet Metal Workers	$20	$42,627	$19	$38,745
Structural Iron and Steel Workers	$23	$47,553	$22	$44,755
Helpers, Construction Trades	$16	$32,807	$16	$32,412
Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	$16	$33,933	$16	$34,021
Helpers--Carpenters	$16	$32,537	$15	$32,065
Helpers--Electricians	$18	$36,574	$17	$35,944
Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons	$13	$27,715	$13	$28,066
Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	$15	$30,856	$14	$29,353
Helpers--Roofers	$16	$32,645	$16	$33,892
Helpers, Construction Trades, All Other	$15	$30,346	$14	$28,544
Other Construction and Related Workers	$18	$37,259	$17	$35,641
Fence Erectors	$16	$33,845	$17	$34,340
Extraction Workers	$20	$41,805	$20	$41,466
Earth Drillers, Except Oil and Gas	$23	$47,908	$22	$45,282
Roustabouts, Oil and Gas	$19	$40,346	$20	$40,833
Installation, Maintenance, and Repair Occupations	$23	$47,142	$22	$45,822

Supervisors of Installation, Maintenance, and Repair Workers	$30	$62,674	$28	$58,588
First-Line Supervisors of Mechanics, Installers, and Repairers	$30	$62,674	$28	$58,588
Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	$24	$49,279	$24	$49,351
Automotive Service Technicians and Mechanics	$24	$49,529	$24	$48,897
Bus and Truck Mechanics and Diesel Engine Specialists	$23	$46,871	$23	$48,176
Mobile Heavy Equipment Mechanics, Except Engines	$24	$50,259	$24	$49,852
Other Installation, Maintenance, and Repair Occupations	$22	$45,036	$21	$43,051
Mechanical Door Repairers	$24	$48,999	$25	$52,878
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	$22	$46,780	$22	$44,999
Industrial Machinery Mechanics	$26	$54,802	$25	$51,448
Millwrights	$28	$58,185	$28	$58,189
Electrical Power-Line Installers and Repairers	$23	$48,371	$23	$47,681
Telecommunications Line Installers and Repairers	$23	$46,951	$22	$46,467
Maintenance and Repair Workers, General	$24	$49,194	$23	$47,388
Wind Turbine Service Technicians	$20	$41,501	$19	$38,836
Helpers--Installation, Maintenance, and Repair Workers	$15	$30,188	$14	$29,096
Production Occupations	$26	$53,685	$23	$48,736
Supervisors, Production Workers	$35	$73,738	$34	$70,832
First-Line Supervisors of Production and Operating Workers	$35	$73,738	$34	$70,832
Assemblers and Fabricators	$17	$34,883	$16	$33,286
Metal Workers and Plastic Workers	$30	$61,433	$28	$58,237
Welders, Cutters, Solderers, and Brazers	$30	$62,312	$28	$59,137
Other Production Occupations	$20	$42,220	$20	$41,488
Inspectors, Testers, Sorters, Samplers, and Weighers	$24	$50,519	$24	$49,970
Helpers--Production Workers	$19	$40,471	$19	$40,021
Transportation and Material Moving Occupations	$22	$44,876	$21	$43,970
Supervisors, Transportation and Material Moving Workers	$31	$63,725	$27	$55,620

First-Line Supervisors of Transportation and Material-Moving Mach	$31	$64,347	$27	$56,751
Motor Vehicle Operators	$21	$43,223	$21	$43,144
Heavy and Tractor-Trailer Truck Drivers	$21	$43,400	$21	$43,278
Light Truck or Delivery Services Drivers	$14	$28,976	$14	$29,480
Material Moving Workers	$23	$48,798	$24	$49,498
Excavating and Loading Machine and Dragline Operators	$26	$53,550	$26	$53,805
Laborers and Freight, Stock, and Material Movers, Hand	$15	$30,944	$15	$30,684

Exports

No international exports from Wyoming, according to US Import and Export Trade Statistics

Enablers

- Prevalence of construction-intensive primary industries (e.g. mining and oil and gas)

Industry Input:

> *A major enabler for building construction is the State of Wyoming. School construction has fueled the building construction industry in Wyoming for over the past decade, regardless of funding shortfalls, the school construction boom is winding down.*
>
> *This may be an opportune time for the State to investigate how they may more effectively deploy construction funding to help keep their costs down, but to also help sustain the industry during down times.*
>
> *-Wyoming Construction Coalition, Inc.*

Construction
Enablers
No corporate and personal income tax
Low sales taxes
Community College Training Programs
Incentives
BRC - Business Committed Grants
BRC - Community Enhancement Grants
BRC - Community Readiness Grants
Challenge Loan
Workforce Training Grants
Challenges
Lack of skilled workforce (in-state subs, etc.)
Availabiltiy of workforce
Significant out-of-state competition

Obstacles

Industry Input:

Lack of reliable job base in sufficient numbers for building more homes for first time home buyers.

Lack of appraisers in some of the smaller rural area and there is a problem with replacing them.

Increased government regulation (DOT, MSHA, OSHA, EPA, DEQ, Local, State, and Federal) continues to change the competitive landscape. Large companies that have the resources to comply have a difficult time competing with small companies that do not as they are uninformed and unregulated. Mid-size companies find it very

challenging to manage the costs of compliance. We are therefore seeing the mid-size are either go away after the first generation, or are purchased by larger companies.

Addressing the skilled needs of the construction industry will continue as liberal academia continues to project a negative view of the construction trades and encourage higher education with a limited (or zero) return on investment.

Manpower is industries biggest obstacle for growth since we are unable to find good reliable workers interested in the construction industry.

-Wyoming Contractors Association

Perhaps the biggest obstacle to Wyoming building construction is the dramatic swings in the boom bust market.

Boom and bust cycles impact building construction dramatically. Funds often become available for construction quickly and in large amounts at the beginning of a boom cycle. Owners want projects built quickly, to meet demand contractors must ramp up quickly. The major difficulty is finding and hiring employees. Most building and trades contractors in Wyoming are regional within the state, and do not have a pool they can pull from other regions in the nation. Construction wages spike as contractors compete with high paying oil, gas and mining operations for employees.

The bust cycle begins the opposite way, project funding dries up quickly. Current projects are scaled back. Contractors cut their workforce. The difficulty is finding enough work to sustain a workforce that they can utilize to ramp up when the economy improves. The longer a bust lasts, the more difficult this becomes.

More consistency and sustainability of construction funding could help smooth out the boom-bust cycle for building construction, a difficult proposition for most sectors.

Wyoming Construction Coalition, Inc.

Opportunities

Industry Input:

Now is the time to encourage politicians to eliminate overlapping government regulations, outdated regulations, and discourage the implementation of new regulation.

Increase high school recruiting efforts at a national level and funding to bring back the industrial arts programs. People going directly into the job market out of high school will increase production across the nation and reduce college debt which makes it difficult for collage grades to qualify for home loans.

-Wyoming Contractors Association

The recent boom allowed many Wyoming building and trades contractors to grow and attracted new companies and individuals into the state. Perhaps at no other

time in Wyoming's history has there been a greater base of building and trades available to tackle projects of all sizes and complexities.

Several surrounding states are now experiencing construction booms of their own, most notably the Front Range. This is an opportunity for Wyoming based contractors to expand into other regional markets while maintaining a presence here.

The increased use of technology in construction may help attract more individuals into the industry.

-Wyoming Construction Coalition, Inc.

Manufacturing (31-33)

Summary of Sector

The manufacturing sector comprises companies who make products from materials, substances, and components. These companies include food manufacturing, beverage and tobacco manufacturing, textile mills, wood product manufacturing, petroleum and coal products manufacturing, and many others. For a complete list of the NAICS codes in this sector, see Appendix 1.

As a percentage of GPD, Wyoming's manufacturing industry ranks 43rd in the nation. Manufacturing activities contributed 5.5% to Wyoming's GDP in 2016 compared to 11.7% for the US. If Wyoming can close that gap the 6% difference would add $2 billion to the State's GDP

Wyoming's manufacturing workforce is much smaller than that of comparator states and has seen a decline between 2005 and 2016. The largest portion of Wyoming's workforce, at 47.2%, is employed in businesses related to petroleum and coal products manufacturing, chemical manufacturing, plastics and rubber products manufacturing, and nonmetallic mineral product manufacturing. Nationwide, only 16.5% of manufacturing jobs fall within these business categories. Wages within this sector pay less than the national average but more than most surrounding states, including: Idaho, Montana, New Mexico, North Dakota, South Dakota, and Utah.

Market demand, proximity to markets, access to transportation, air service, lack of skilled workforce, lack of available workforce, housing, regulatory environment, permitting process are some important barriers to this sector.

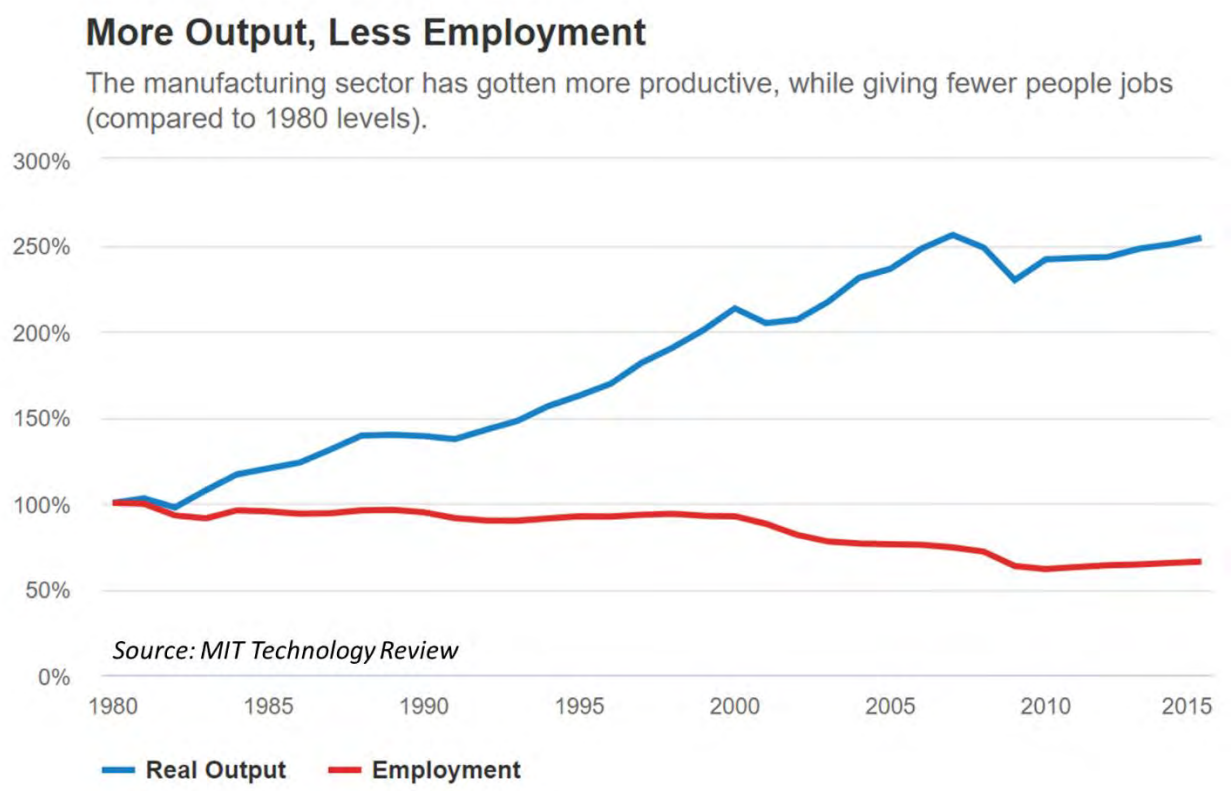
Opportunities in this sector include value-added agriculture, value-added minerals, and manufacturing machines and components. Workforce training funds, sales tax exemptions on equipment and electricity used in manufacturing process, build/lease/purchase option, large loan fund, challenge/bridge loan fund are important enablers to this sector in Wyoming.

US manufacturing production has increased while US manufacturing jobs have declined steadily for the past 30-40 years, owing to automation, trade, or other influences. Despite the long-term trend in employment, manufacturing jobs have been increasing slightly since 2010, and some are optimistic about the future of US manufacturing, citing innovation, and an emergence of consumers globally.

Trends

Industry Input:

> *Heavy industrial manufacturing is stable after a 30% decline in demand. I believe we are on the verge of the next boom as it is long overdue and conditions are right.*
>
> *-L&H Industrial*



Over the last 40 years, production has increased (inflation-adjusted US production is higher than it has ever been), and employment has decreased. According to the Brookings Institute, not everyone agrees on the reasons for this decline (https://www.brookings.edu/wp-content/uploads/2016/06/us-manufacturing-past-and-potential-future-baily-bosworth.pdf). Some attribute it to trade, for example Pierce and Schott (2012) (Pierce, Justin R., and Peter K. Schott. 2012. "The Surprisingly Swift Decline of US Manufacturing Employment." NBER Working Paper 18655, December) attribute the trend to the granting of permanent normal trade relations to China in 2000. Others attribute this to automation or other factors. Boston Consulting Group reports that it costs barely $8 an hour to use a robot for spot welding in the auto industry, compared to $25 for a worker (https://www.technologyreview.com/s/602869/manufacturing-jobs-arent-coming-back/), and Edwards and Lawrence (2013) (Edwards, Lawrence, and Robert Z. Lawrence. 2013. Rising Tide: Is Growth in Emerging Economies Good for the United States? Washington, DC: Peterson Institute for International Economics.) conclude that trade accounts for little of the fall in employment after 2000.

Despite this long-term trend, data show that US manufacturing employment has ticked up slightly since 2010.

According to the National Manufacturers Association:

- Manufacturing is expected to grow by 4.8% in the next 12 months
- Positive outlooks are at a 20-year high
- Despite the fear of automation and robots, 3.5 million manufacturing jobs will be needed, but 2 million will likely go unfilled because of the skills gap

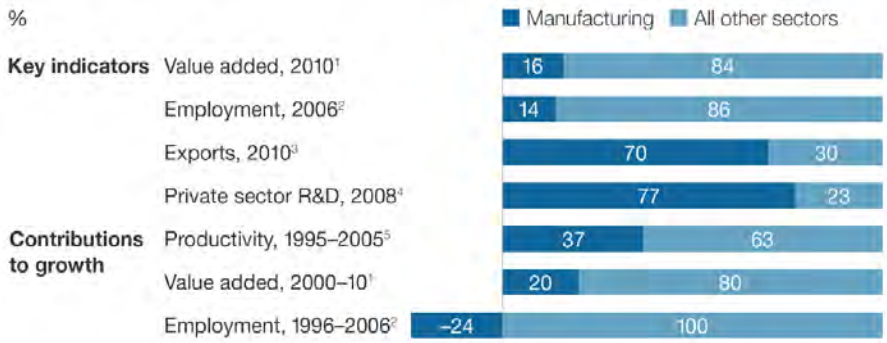
In today's advanced economies, manufacturing promotes innovation, productivity, and trade more than growth and employment. Manufacturing also has begun to consume more services and to rely more

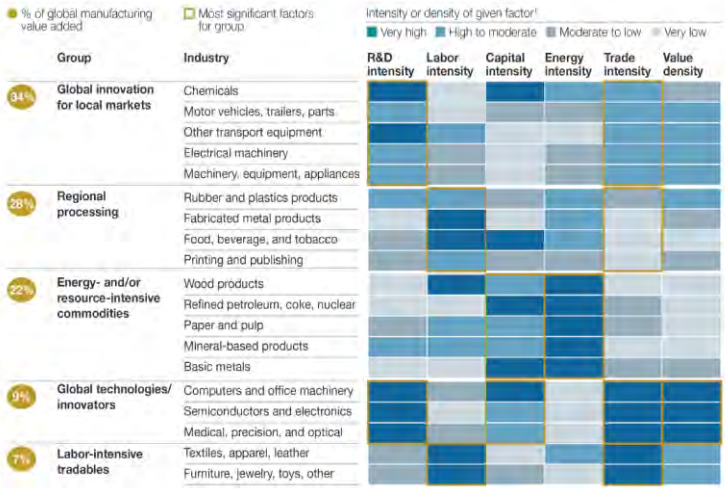
heavily on them to operate. As a new global consuming class emerges in developing nations, and innovations spark additional demand, global manufacturers will have substantial new opportunities—but in a much more uncertain environment.

- Manufacturing's role is changing
- Manufacturing is not monolithic
- Manufacturing is entering a dynamic new phase

Globally, manufacturing continues to grow. It now accounts for approximately 16 percent of global GDP and 14 percent of employment. But the manufacturing sector's relative size in an economy varies with its stage of development. Manufacturers will continue to hire workers, both in production and nonproduction roles (such as design and after-sales service). In the long run, manufacturing's share of employment will remain under pressure because of ongoing productivity improvements, faster growth in services, and the force of global competition, which pushes advanced economies to specialize in activities requiring more skill.

Manufacturing contributes disproportionately to exports, innovation, and productivity growth.

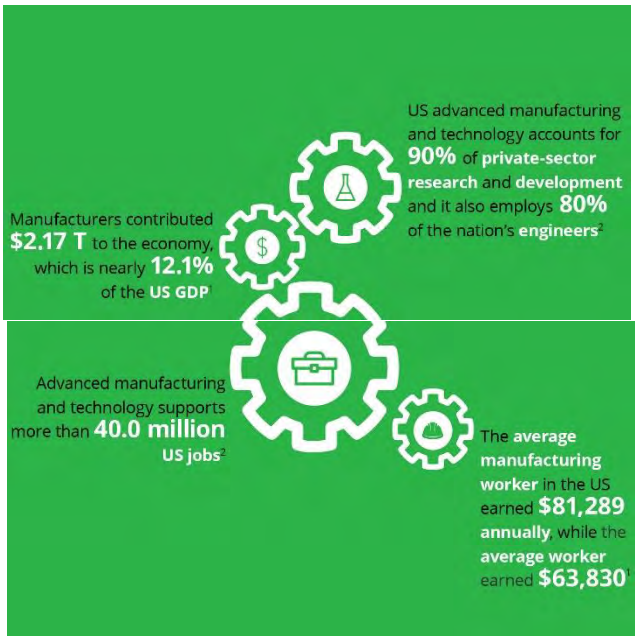




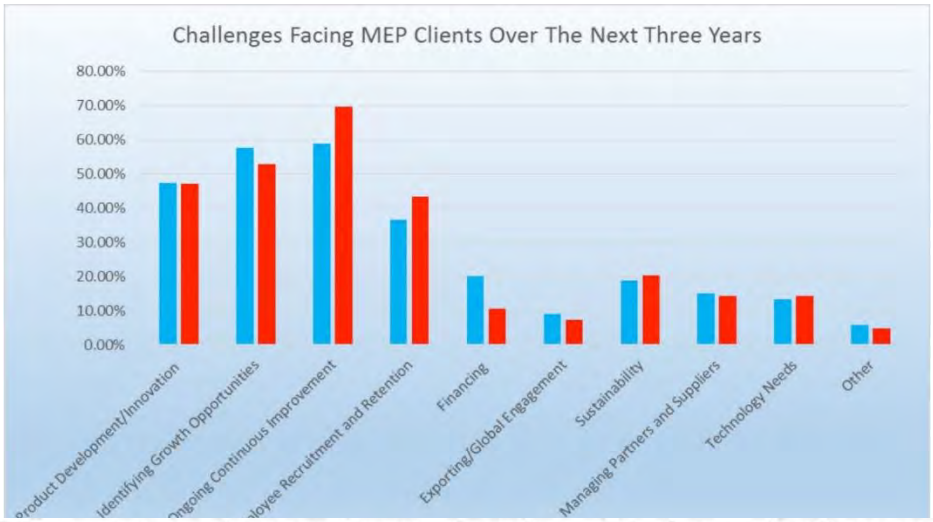
New Era

- New global consuming class is emerging
- Market demand is fragmenting as customers ask for greater variation and more types of after-sales service.
- A rich pipeline of innovations in materials and processes—from nanomaterials to 3-D printing to advanced robotics—promises to create fresh demand and drive further productivity gains across manufacturing industries and geographies.

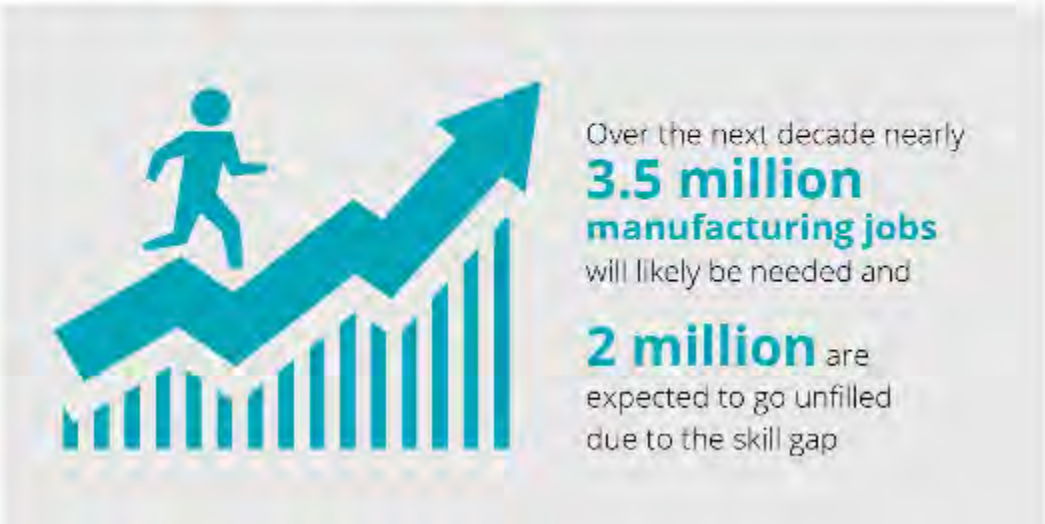
Manufacturing fuels the US economy by creating jobs and driving advancements in technology



High-performing manufacturers outperform their peers by focusing on four areas[5]



US manufacturers face significant talent challenges given the widening skills gap[6]



Industry Focus Around the State

Communities around the state have identified the following specific focus industries within the manufacturing sector. This data was collected using the ENDOW Regional Assessment.

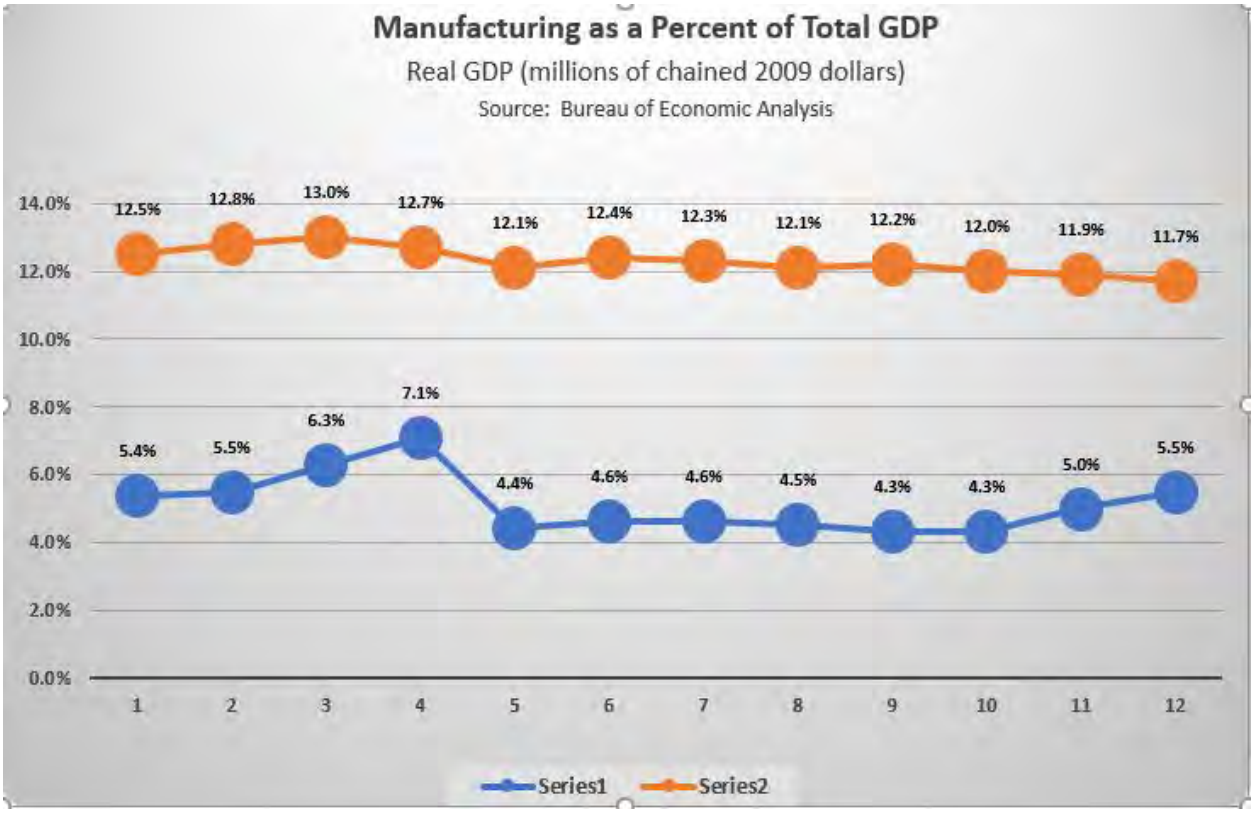
Light Manufacturing	Value Added Manufacturing	Plastics	Carbon Fiber	Personal Care Manufacturing
Wind Manufacturing	Advanced Manufactring	Advanced Carbon Products	Food Processing	Brewing
Mix Distilation	Uranium Processing	Processing	Value Added Water Source	Iron Ore / Steel Processing
Meat Processing	Nutraceuticals	Steel Product Manufacturing	Tires-to-fuel	Natural Gas To Alcohol Additive
Food Processing Additive	Grain Processing	Crude Oil To Refined Products	Natural Gas To Nitrogen	Meat Packing
Quilting	Pharmaceutical	Precision Manufacturing	Meat Products	Firearm Manufacturing
Oil Distillation	Trona Products	Fertilizer	Natural Gas Processing Plants	Sugar Processing
Anhydrous Ammonia	Enhanced Polimer	Beverage Industry	Bentonite Processing/Packaging	Meat Processing Facility
Coal To Liquid Gasification	Animal Food Manufacturing	Dairy Product Manufacturing	Advanced Bio Fuels	Grain & Oilseed Milling
Bakeries & Tortilla Manufacturing	Leather And Hide Tanning And Finishing	Ag Value Added Manufacturing	Sawmills	Biopharmaceuticals And Bioengineering
	Biogas Fuel Cell	Food Production	Biogas	

How does Wyoming compare?

WY Manufacturing as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Manufacturing	% of Total GDP
2005	$29,637	$1,592	5.4%
2010	$36,469	$1,661	4.6%
2016	$34,439	$1,884	5.5%

U.S. Manufacturing as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Manufacturing	% of Total GDP
2005	$14,203,241	$1,776,685	12.5%
2010	$14,628,165	$1,818,190	12.4%
2016	$16,342,925	$1,909,249	11.7%

Source: Bureau of Economic Analysis



Over the next 20 years, if Wyoming increases the 5.5% Manufacturing GDP to equal the 11.7% GDP of US manufacturing, that 6.2% increase would equate to $1.2 billion dollars.

Wyoming and United States Manufacturing Sector Establishments

Industry	2005				2010			
	WY		U.S.		WY		U.S.	
Manufacturing	#	% of Total Mfg.	#	% of Total Mfg.	#	% of Total Mfg.	#	% of Total Mfg.
Fabricated Metal Product Mfg.	102	15.741%	60,510	16.562%	109	18.106%	58,851	17.175%
Food Mfg.	78	12.037%	28,281	7.741%	76	12.625%	28,481	8.312%
Nonmetallic Mineral Product Mfg.	53	8.179%	17,621	4.823%	57	9.468%	17,171	5.011%
Miscellaneous Mfg.	44	6.790%	32,500	8.896%	38	6.312%	31,336	9.145%
Printing and Related Support Activities	57	8.796%	37,472	10.256%	49	8.140%	32,114	9.372%
Machinery Mfg.	32	4.938%	31,283	8.562%	38	6.312%	29,483	8.604%
Furniture and Related Product Mfg.	58	8.951%	23,984	6.565%	44	7.309%	20,371	5.945%
Wood Product Mfg.	41	6.327%	17,538	4.800%	31	5.150%	15,435	4.505%
Beverage and Tobacco Product Mfg.	13	2.006%	4,343	1.189%	16	2.658%	5,298	1.546%
Chemical Mfg.	32	4.938%	15,491	4.240%	34	5.648%	16,043	4.682%
Textile Product Mills	19	2.932%	7,611	2.083%	29	4.817%	7,522	2.195%
Petroleum and Coal Products Mfg.	18	2.778%	2,350	0.643%	16	2.658%	2,339	0.683%
Computer and Electronic Product Mfg.	15	2.315%	19,665	5.382%	8	1.329%	18,784	5.482%
Electrical Equipment and Appliance Mfg.	15	2.315%	7,282	1.993%	13	2.159%	7,332	2.140%
Transportation Equipment Mfg.	25	3.858%	15,322	4.194%	15	2.492%	14,488	4.228%
Leather and Allied Product Mfg.	10	1.543%	1,477	0.404%	10	1.661%	1,278	0.373%
Plastics and Rubber Products Mfg.	17	2.623%	14,658	4.012%	12	1.993%	13,430	3.919%
Textile Mills	1	0.154%	4,249	1.163%	4	0.664%	3,247	0.948%
Primary Metal Mfg.	3	0.463%	5,988	1.639%	3	0.498%	5,814	1.697%
Apparel Mfg.	13	2.006%	11,264	3.083%	4	0.664%	7,855	2.292%
Paper Mfg.	2	0.309%	6,463	1.769%	0	0.000%	5,977	1.744%

Source: Bureau of Labor Statistics

Industry	2016				
	WY			U.S.	
Manufacturing	#	% of Total Mfg.		#	% of Total Mfg.
Fabricated Metal Product Mfg.	117	19.435%		58,334	16.959%
Food Mfg.	72	11.960%		32,515	9.453%
Nonmetallic Mineral Product Mfg.	47	7.807%		16,287	4.735%
Miscellaneous Mfg.	45	7.475%		31,946	9.287%
Printing and Related Support Activities	45	7.475%		28,779	8.367%
Machinery Mfg.	43	7.143%		29,972	8.713%
Furniture and Related Product Mfg.	35	5.814%		17,622	5.123%
Wood Product Mfg.	31	5.150%		14,675	4.266%
Beverage and Tobacco Product Mfg.	31	5.150%		9,783	2.844%
Chemical Mfg.	30	4.983%		17,564	5.106%
Textile Product Mills	26	4.319%		6,681	1.942%
Petroleum and Coal Products Mfg.	17	2.824%		2,317	0.674%
Computer and Electronic Product Mfg.	15	2.492%		19,589	5.695%
Electrical Equipment and Appliance Mfg.	13	2.159%		7,981	2.320%
Transportation Equipment Mfg.	11	1.827%		14,750	4.288%
Leather and Allied Product Mfg.	8	1.329%		1,354	0.394%
Plastics and Rubber Products Mfg.	7	1.163%		13,188	3.834%
Textile Mills	5	0.831%		2,808	0.816%
Primary Metal Mfg.	3	0.498%		5,533	1.609%
Apparel Mfg.	1	0.166%		6,824	1.984%
Paper Mfg.	0	0.000%		5,480	1.593%

States with the Highest and Lowest Shares of Manufacturing, 2016

(as a Percentage of Their Gross State Product)

Top Five States		Bottom Five States	
Indiana	28.5%	New York	4.9%
Oregon	24.2%	Nevada	4.3%
Louisiana	19.9%	New Mexico	4.2%
Michigan	19.6%	Alaska	2.8%
Kentucky	18.9%	Hawaii	2.1%

In 2016, Wyoming ranked 43rd in the nation at 5.5%

Manufacturing plays a significant role in our national economy, accounting for roughly 12 percent of the United States GDP. Wyoming would rank 22nd in the nation for manufacturing if we grow our GDP to 12 percent.

Percentage Manufacturing Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Manufacturing GDP	% of Total GDP
Wyoming	$1,884	5.5%
Alaska	$1,313	2.8%
Colorado	$20,321	6.9%
Idaho	$7,230	12.1%
Montana	$3,275	8.0%
New Mexico	$3,622	4.2%
North Dakota	$3,166	6.6%
South Dakota	$3,882	9.3%
Utah	$15,378	11.3%
United States	$1,909,249	11.7%

Source: Bureau of Economic Analysis

Percentage Manufacturing Contributes to Total Employment

2016

	Manufacturing Employment	% of Total Employment
Wyoming	9,230	3.4%
Alaska	13,570	4.2%
Colorado	142,386	5.6%
Idaho	63,795	9.3%
Montana	19,463	4.3%
New Mexico	26,830	3.3%
North Dakota	24,558	5.9%
South Dakota	42,157	10.0%
Utah	125,067	9.0%
United States	12,295,670	8.7%

Source: Bureau of Labor Statistics

Firms in Wyoming	
Total Firms	647
Average Age	35
Number Firms Under 5 Years Old	222
Number Firms 5-9 Years Old	128
Number Firms over 10 Years Old	297

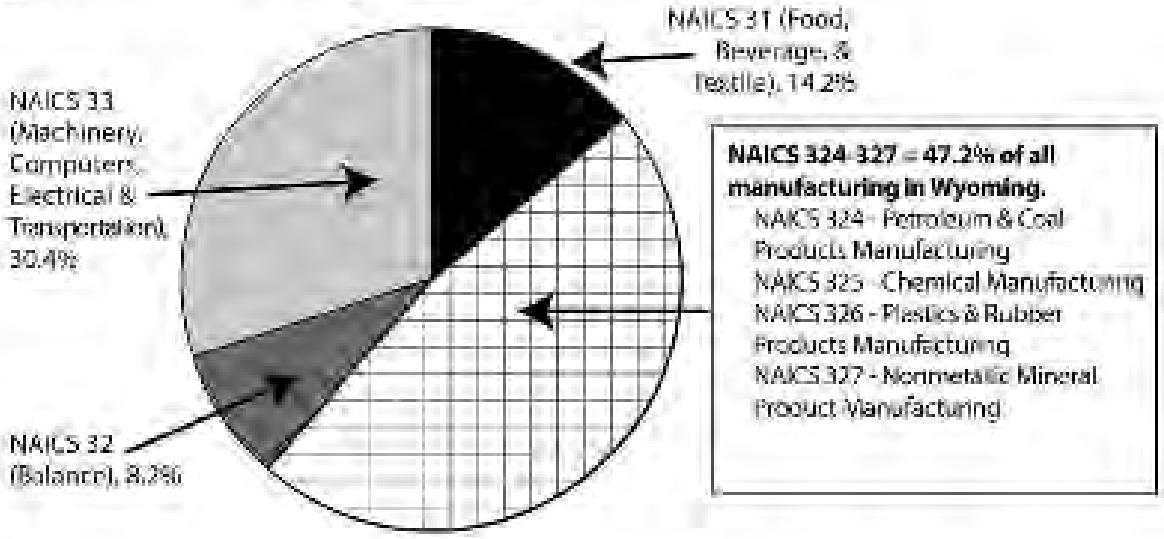
Wyoming and United States Firms, Employees and Annual Wage (2016)

		Wyoming			United States		
NAICS Code	Industry	Firms	Employees	Annual Wages	Firms	Employees	Annual Wages
31-33	Manufacturing	602	9,230	64,007	343,978	12,295,670	64,860
311	Food manufacturing	72	737	31,519	32,515	1,544,655	46,110
312	Beverage and tobacco product manufacturing	31	412	38,269	9,783	246,660	52,661
313	Textile mills	5	0	0	2,808	113,660	44,662
314	Textile product mills	26	132	27,015	6,681	115,767	39,911
315	Apparel manufacturing	1	0	0	6,824	128,781	39,770
316	Leather and allied product manufacturing	8	21	22,015	1,354	29,259	43,027
321	Wood product manufacturing	31	489	41,076	14,675	390,175	42,369
322	Paper manufacturing	0	0	0	5,480	369,056	65,711
323	Printing and related support activities	45	268	30,256	28,779	445,920	48,057
324	Petroleum and coal products manufacturing	17	1,399	100,837	2,317	110,930	112,249
325	Chemical manufacturing	30	1,865	93,668	17,564	811,109	93,439
326	Plastics and rubber products manufacturing	7	235	47,422	13,188	700,362	51,567
327	Nonmetallic mineral product manufacturing	47	848	55,565	16,287	405,418	55,730
331	Primary metal manufacturing	3	84	49,330	5,533	373,419	64,682
332	Fabricated metal product manufacturing	117	1,302	53,252	58,334	1,414,735	54,512
333	Machinery manufacturing	43	547	56,762	29,972	1,070,739	67,453
334	Computer and electronic product manufacturing	15	156	60,738	19,589	1,044,291	114,180
335	Electrical equipment and appliance mfg.	13	202	58,265	7,981	380,289	65,181
336	Transportation equipment manufacturing	11	188	44,000	14,750	1,623,154	72,252
337	Furniture and related product manufacturing	35	181	29,196	17,622	388,805	43,375
339	Miscellaneous manufacturing	45	146	34,410	31,946	588,487	61,817

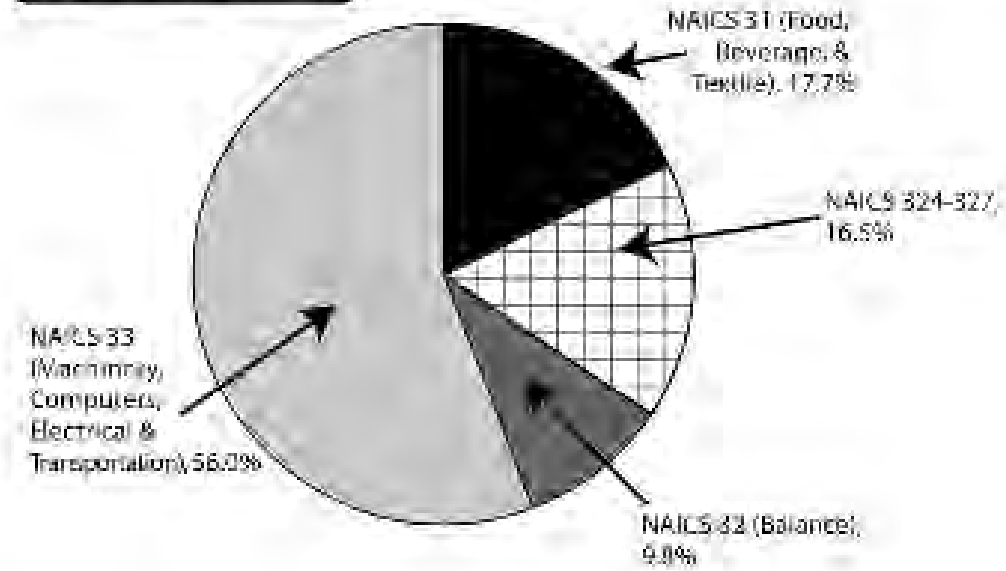
NAICS[a] 31-33: Manufacturing

Distribution of Jobs by 2-Digit NAICS Code in Wyoming and the U.S., 2016 Annual Average

Wyoming, N = 9,230



U.S., N = 12.3 Million



[a] North American Industry Classification System.

Source: Quarterly Census of Employment and Wages, U.S. Bureau of Labor Statistics.

Prepared by: [illegible] Research & Planning, WY DWS, 7/2017.

Workforce

Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	558	12,548	$35,900
Colorado	2005	6,019	150,586	$53,691
Idaho	2005	2,139	62,961	$42,844
Montana	2005	1,340	19,508	$36,944
New Mexico	2005	1,672	36,306	$41,844
North Dakota	2005	824	25,903	$36,377
South Dakota	2005	1,032	39,833	$34,392
Utah	2005	3,764	116,413	$39,859
Wyoming	2005	648	9,709	$40,589
US	2005	365,351	14,190,394	$49,286

State	Year	Firms	Employees	Annual Wage
Alaska	2005	558	12,548	$35,900
Colorado	2005	6,019	150,586	$53,691
Idaho	2005	2,139	62,961	$42,844
Montana	2005	1,340	19,508	$36,944
New Mexico	2005	1,672	36,306	$41,844
North Dakota	2005	824	25,903	$36,377
South Dakota	2005	1,032	39,833	$34,392
Utah	2005	3,764	116,413	$39,859
Wyoming	2005	648	9,709	$40,589
US	2005	365,351	14,190,394	$49,286

State	Year	Firms	Employees	Annual Wage
Alaska	2016	533	13,570	$47,793
Colorado	2016	5,714	142,386	$66,329
Idaho	2016	2,587	63,795	$55,243
Montana	2016	1,479	19,463	$47,783
New Mexico	2016	1,736	26,830	$55,658
North Dakota	2016	815	24,558	$51,030
South Dakota	2016	1,097	42,157	$45,986
Utah	2016	4,110	125,067	$55,205
Wyoming	2016	602	9,230	$64,014
US	2016	343,978	12,295,670	$64,860

Occupations in Manufacturing

Title	Mean Hourly	Mean Annual	Median Hourly	Median Annual
Total all occupations	$27	$57,096	$24	$49,431
Management Occupations	$57	$118,658	$54	$113,310
Top Executives	$55	$114,172	$46	$95,368
General and Operations Managers	$55	$113,655	$46	$94,897
Advertising, Marketing, Promotions, Public Relations, and Sales Managers	$68	$140,435	$58	$121,612
Operations Specialties Managers	$57	$118,318	$57	$119,330
Financial Managers	$60	$124,438	$44	$91,978
Industrial Production Managers	$55	$114,747	$57	$117,786
Other Management Occupations	$66	$136,594	$66	$138,222
Architectural and Engineering Managers	$68	$141,640	$68	$142,296
Managers, All Other	$66	$136,491	$66	$137,897
Business and Financial Operations Occupations	$37	$77,853	$38	$78,110
Business Operations Specialists	$38	$78,872	$38	$78,671
Purchasing Agents, Except Wholesale, Retail, and Farm Products	$30	$63,384	$30	$61,393
Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	$42	$87,510	$41	$84,373
Cost Estimators	$32	$65,977	$33	$68,609
Human Resources Specialists	$29	$59,990	$27	$56,654
Logisticians	$40	$83,763	$42	$86,467
Training and Development Specialists	$46	$96,088	$47	$97,501
Business Operations Specialists, All Other	$45	$93,484	$45	$92,738
Financial Specialists	$35	$73,431	$36	$74,800
Accountants and Auditors	$36	$75,364	$37	$77,242
Computer and Mathematical Occupations	$35	$72,105	$35	$73,222
Computer Specialists	$35	$72,109	$35	$73,344
Network and Computer Systems Administrators	$40	$82,671	$41	$85,633
Computer User Support Specialists	$27	$56,713	$31	$65,060
Architecture and Engineering Occupations	$43	$89,772	$43	$89,054
Engineers	$46	$95,949	$46	$94,900
Chemical Engineers	$52	$107,766	$50	$104,900
Electrical Engineers	$35	$73,732	$35	$72,008
Environmental Engineers	$49	$102,828	$50	$103,394
Industrial Engineers	$45	$93,840	$45	$92,909
Mechanical Engineers	$43	$89,875	$42	$86,555
Drafters, Engineering, and Mapping Technicians	$29	$60,240	$28	$58,636
Mechanical Drafters	$28	$59,017	$27	$55,415
Life, Physical, and Social Science Occupations	$35	$71,921	$35	$71,986
Physical Scientists	$40	$83,503	$41	$85,730
Chemists	$38	$79,154	$40	$83,702

Life, Physical, and Social Science Technicians	$33	$68,356	$34	$71,319
Chemical Technicians	$33	$69,088	$35	$71,806
Arts, Design, Entertainment, Sports, and Media Occupations	$20	$41,819	$20	$41,089
Art and Design Workers	$20	$40,980	$20	$40,781
Graphic Designers	$19	$39,391	$19	$39,228
Healthcare Practitioners and Technical Occupations	$41	$84,438	$40	$84,005
Health Diagnosing and Treating Practitioners	$39	$80,828	$34	$71,526
Other Healthcare Practitioners and Technical Occupations	$42	$86,919	$42	$86,460
Occupational Health and Safety Specialists	$43	$89,528	$43	$88,642
Protective Service Occupations	$21	$44,653	$25	$52,656
Other Protective Service Workers	$20	$41,313	$14	$28,925
Security Guards	$20	$41,313	$14	$28,925
Food Preparation and Serving-Related Occupations	$9	$19,439	$9	$18,560
Cooks and Food Preparation Workers	$10	$21,798	$11	$22,312
Food Preparation Workers	$10	$21,536	$11	$22,170
Food and Beverage Serving Workers	$9	$17,995	$9	$17,768
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	$10	$20,512	$10	$19,780
Waiters and Waitresses	$8	$16,889	$8	$17,277
Other Food Preparation and Serving Related Workers	$10	$20,117	$10	$20,482
Building and Grounds Cleaning and Maintenance Occupations	$20	$40,640	$16	$33,501
Building Cleaning and Pest Control Workers	$17	$35,148	$14	$29,958
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$17	$35,148	$14	$29,958
Sales and Related Occupations	$32	$66,418	$24	$49,526
Retail Sales Workers	$12	$24,016	$11	$23,401
Retail Salespersons	$11	$23,418	$11	$23,178
Sales Representatives, Wholesale and Manufacturing	$38	$79,389	$31	$63,568
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	$67	$139,106	$61	$127,476
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	$30	$62,516	$27	$56,736
Office and Administrative Support Occupations	$19	$39,771	$18	$36,588
Supervisors, Office and Administrative Support Workers	$34	$69,851	$30	$61,653
First-Line Supervisors of Office and Administrative Support Worke	$34	$69,851	$30	$61,653
Financial Clerks	$21	$42,769	$19	$39,696
Bookkeeping, Accounting, and Auditing Clerks	$21	$44,091	$19	$40,088
Payroll and Timekeeping Clerks	$17	$34,950	$16	$33,752
Information and Record Clerks	$19	$40,235	$19	$39,619
Customer Service Representatives	$20	$41,530	$20	$42,319
Human Resources Assistants, Except Payroll and Timekeeping	$19	$40,264	$18	$37,460

Receptionists and Information Clerks	$18	$38,008	$17	$35,643
Material Recording, Scheduling, Dispatching, and Distributing Workers	$22	$46,710	$21	$43,802
Production, Planning, and Expediting Clerks	$29	$61,208	$28	$58,584
Shipping, Receiving, and Traffic Clerks	$17	$34,935	$15	$30,918
Stock Clerks and Order Fillers	$28	$59,206	$29	$60,754
Secretaries and Administrative Assistants	$17	$35,474	$16	$33,585
Executive Secretaries and Executive Administrative Assistants	$21	$44,703	$21	$44,484
Secretaries and Administrative Assistants, Except Legal, Medical,	$17	$34,858	$16	$32,762
Other Office and Administrative Support Workers	$16	$33,164	$16	$33,135
Office Clerks, General	$16	$33,094	$16	$33,146
Construction and Extraction Occupations	$25	$51,228	$23	$47,979
Supervisors, Construction and Extraction Workers	$32	$65,817	$26	$53,630
First-Line Supervisors of Construction Trades and Extraction Work	$32	$65,817	$26	$53,630
Construction Trades Workers	$24	$49,719	$23	$47,200
Carpenters	$15	$30,225	$12	$25,144
Cement Masons and Concrete Finishers	$16	$32,397	$14	$29,747
Operating Engineers and Other Construction Equipment Operators	$25	$50,956	$25	$51,710
Electricians	$30	$62,767	$32	$67,371
Installation, Maintenance, and Repair Occupations	$34	$69,938	$34	$71,283
Supervisors of Installation, Maintenance, and Repair Workers	$45	$93,023	$45	$94,371
First-Line Supervisors of Mechanics, Installers, and Repairers	$45	$93,023	$45	$94,371
Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	$24	$49,361	$23	$47,424
Bus and Truck Mechanics and Diesel Engine Specialists	$25	$52,305	$24	$49,171
Mobile Heavy Equipment Mechanics, Except Engines	$22	$46,696	$22	$46,570
Other Installation, Maintenance, and Repair Occupations	$33	$68,517	$34	$70,960
Industrial Machinery Mechanics	$30	$62,962	$31	$63,802
Maintenance Workers, Machinery	$28	$57,407	$28	$58,506
Maintenance and Repair Workers, General	$35	$72,954	$37	$77,056
Production Occupations	$24	$50,068	$22	$45,456
Supervisors, Production Workers	$34	$70,109	$30	$63,327
First-Line Supervisors of Production and Operating Workers	$34	$70,109	$30	$63,327
Assemblers and Fabricators	$19	$39,536	$17	$35,617
Electrical and Electronic Equipment Assemblers	$21	$43,589	$19	$39,005
Structural Metal Fabricators and Fitters	$20	$41,218	$18	$37,546
Team Assemblers	$18	$37,094	$16	$33,964
Food Processing Workers	$14	$29,539	$14	$29,055

Bakers	$15	$30,713	$14	$30,058
Butchers and Meat Cutters	$13	$27,614	$13	$27,235
Meat, Poultry, and Fish Cutters and Trimmers	$15	$31,272	$16	$32,877
Slaughterers and Meat Packers	$13	$27,926	$14	$28,333
Food Batchmakers	$13	$27,521	$13	$27,679
Metal Workers and Plastic Workers	$21	$44,582	$21	$43,876
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	$18	$36,495	$17	$35,095
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	$18	$37,570	$17	$35,688
Machinists	$21	$43,165	$21	$42,909
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	$14	$28,678	$13	$27,243
Welders, Cutters, Solderers, and Brazers	$24	$49,361	$23	$48,755
Tool Grinders, Filers, and Sharpeners	$18	$37,303	$18	$36,585
Printing Workers	$15	$30,308	$14	$29,545
Printing Press Operators	$15	$30,685	$15	$30,190
Textile, Apparel, and Furnishings Workers	$13	$27,249	$13	$26,004
Sewing Machine Operators	$14	$28,692	$13	$27,690
Woodworkers	$17	$35,314	$16	$33,733
Cabinetmakers and Bench Carpenters	$20	$41,224	$19	$39,618
Sawing Machine Setters, Operators, and Tenders, Wood	$16	$32,672	$15	$30,693
Woodworking Machine Setters, Operators, and Tenders, Except Sawing	$14	$29,256	$12	$24,783
Plant and System Operators	$34	$70,605	$35	$72,806
Chemical Plant and System Operators	$36	$74,286	$36	$74,653
Petroleum Pump System Operators, Refinery Operators, and Gaugers	$33	$68,057	$34	$70,319
Other Production Occupations	$22	$45,841	$19	$39,152
Chemical Equipment Operators and Tenders	$37	$76,571	$38	$79,322
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	$21	$44,542	$17	$36,238
Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	$24	$49,492	$22	$45,297
Mixing and Blending Machine Setters, Operators, and Tenders	$18	$38,272	$17	$34,857
Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	$24	$49,543	$22	$46,099
Inspectors, Testers, Sorters, Samplers, and Weighers	$23	$48,327	$19	$39,711
Packaging and Filling Machine Operators and Tenders	18	36755	15	31040
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	20	41397	19	40399
Helpers--Production Workers	22	46449	18	37500
Transportation and Material Moving Occupations	19	40443	17	36359

Supervisors, Transportation and Material Moving Workers	33	68683	34	70597
First-Line Supervisors of Helpers, Laborers, and Material Movers,	33	68656	35	72804
First-Line Supervisors of Transportation and Material-Moving Mach	33	68698	34	69837
Motor Vehicle Operators	19	40190	18	37840
Driver/Sales Workers	13	27355	12	24510
Heavy and Tractor-Trailer Truck Drivers	20	41518	18	38404
Light Truck or Delivery Services Drivers	17	34677	15	30832
Material Moving Workers	18	38267	16	33180
Excavating and Loading Machine and Dragline Operators	30	62720	34	70198
Industrial Truck and Tractor Operators	17	35846	18	36956
Laborers and Freight, Stock, and Material Movers, Hand	18	38342	17	35738
Machine Feeders and Offbearers	15	30495	15	30566
Packers and Packagers, Hand	12	24280	11	23853

These pay ranges look like they are half of what we are used to paying. I have not been able to hire welder or machinists at these levels since the 80s. L&H Industrial

I notice the talent and work ethic I find in Gillette and Sheridan is superior to what I can find in Az. (L&H Industrial)

Exports

Top Five Export Markets (2016)
Percent of Total Manufactured Goods Exports (50.41%) ~ Brazil (18.28%) ~ Canada (14.96%) ~ Indonesia (7.69%) ~ Japan (5.09%) ~ United Kingdom (4.40%)

Wyoming's Top 10 Manufacturing Exports

Total Export Value ($US)

2005

NAICS	Commodity	Wyoming	% of Total Mfg. Exports	U.S.	% of Total Mfg. Exports
325	Chemicals	$ 514,913,429	85.77%	$ 118,632,716,819	14.75%
333	Machinery, Except Electrical	$ 40,312,090	6.72%	$ 104,468,026,333	12.99%
335	Electrical Equipment, Appliances and Components	$ 3,940,639	0.66%	$ 30,287,802,789	3.77%
327	Nonmetallic Mineral Products	$ 4,243,104	0.71%	$ 7,030,672,641	0.87%
324	Petroleum and Coal Products	$ 311,747	0.05%	$ 18,069,002,755	2.25%
332	Fabricated Metal Products, Nesoi	$ 9,225,598	1.54%	$ 25,363,966,336	3.15%
334	Computer and Electronic Products	$ 5,045,242	0.84%	$ 168,604,887,520	20.96%
336	Transportation Equipment	$ 10,307,155	1.72%	$ 159,037,185,073	19.77%
326	Plastic and Rubber Products	$ 2,966,791	0.49%	$ 19,897,718,540	2.47%
311	Food and Kindred Products	$ 2,662,258	0.44%	$ 29,661,581,404	3.69%

2010

NAICS	Commodity	Wyoming	% of Total Mfg. Exports	U.S.	% of Total Mfg. Exports
325	Chemicals	$ 718,698,863	82.37%	$ 179,502,159,029	16.31%
333	Machinery, Except Electrical	$ 73,754,686	8.45%	$ 137,799,646,370	12.52%
335	Electrical Equipment, Appliances and Components	$ 7,318,988	0.84%	$ 37,584,652,893	3.42%
327	Nonmetallic Mineral Products	$ 12,775,556	1.46%	$ 9,815,378,555	0.89%
324	Petroleum and Coal Products	$ 6,836,104	0.78%	$ 61,438,246,495	5.58%
332	Fabricated Metal Products, Nesoi	$ 11,709,506	1.34%	$ 35,765,029,740	3.25%
334	Computer and Electronic Products	$ 13,000,868	1.49%	$ 190,435,293,476	17.31%
336	Transportation Equipment	$ 9,685,141	1.11%	$ 190,886,685,380	17.35%
326	Plastic and Rubber Products	$ 5,361,017	0.61%	$ 25,915,393,825	2.36%
311	Food and Kindred Products	$ 2,074,191	0.24%	$ 51,888,511,605	4.72%

2016

NAICS	Commodity	Wyoming	% of Total Mfg. Exports	U.S.	% of Total Mfg. Exports
325	Chemicals	$ 872,039,153	84.6%	$ 184,554,759,292	14.6%
333	Machinery, Except Electrical	$ 54,444,182	5.3%	$ 124,656,532,723	9.9%
335	Electrical Equipment, Appliances and Components	$ 19,781,208	1.9%	$ 57,006,377,865	4.5%
327	Nonmetallic Mineral Products	$ 17,906,531	1.7%	$ 11,455,665,126	0.9%
324	Petroleum and Coal Products	$ 17,526,224	1.7%	$ 66,691,187,355	5.3%
332	Fabricated Metal Products, Nesoi	$ 15,144,472	1.5%	$ 44,727,967,595	3.5%
334	Computer and Electronic Products	$ 11,856,376	1.2%	$ 201,943,183,527	16.0%
336	Transportation Equipment	$ 10,905,252	1.1%	$ 276,746,701,069	21.9%
326	Plastic and Rubber Products	$ 4,541,564	0.4%	$ 32,230,382,990	2.6%
311	Food and Kindred Products	$ 2,114,326	0.2%	$ 61,496,761,174	4.9%

Source: USA Trade, U.S. Census Bureau

Asset Maps

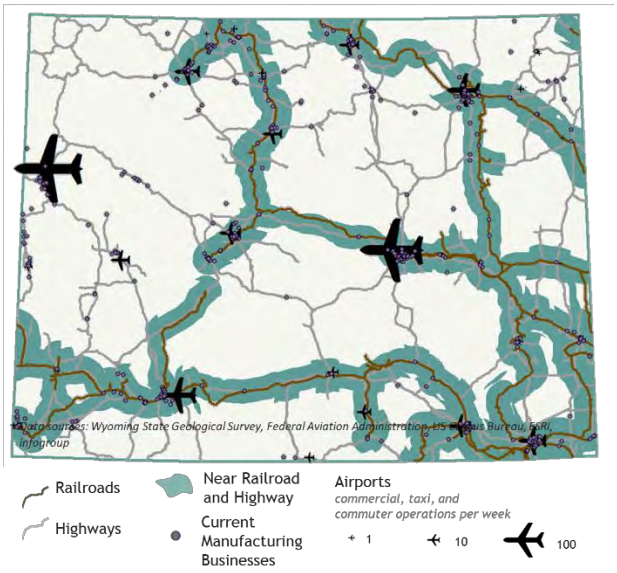
A baseline for delineating Business Development and Innovation Zones

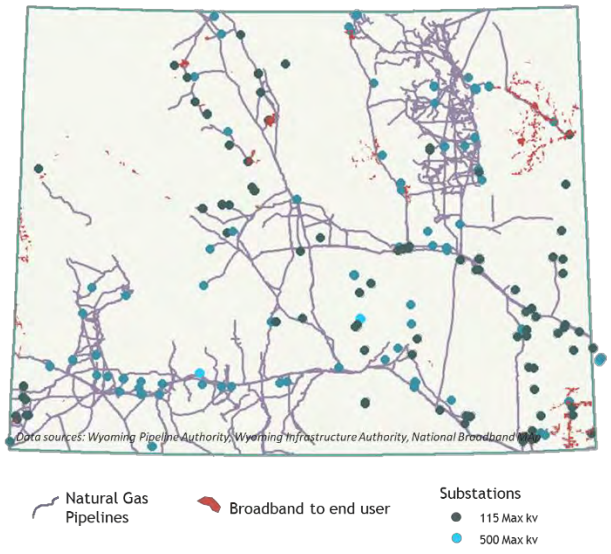
Mappable Sector Assets

Infrastructure	Workforce
•Roads •Railroads •Air transportation •Electricity •Water* •Gas •Internet	•Numbers •Wages •Livability •Housing

*Water is an important resource to manufacturing. However, characterizing water availability at a statewide level requires overgeneralization and assumptions, which can be misleading. Therefore, water is omitted from this statewide analysis, but will certainly be considered in upcoming more focused analyses.

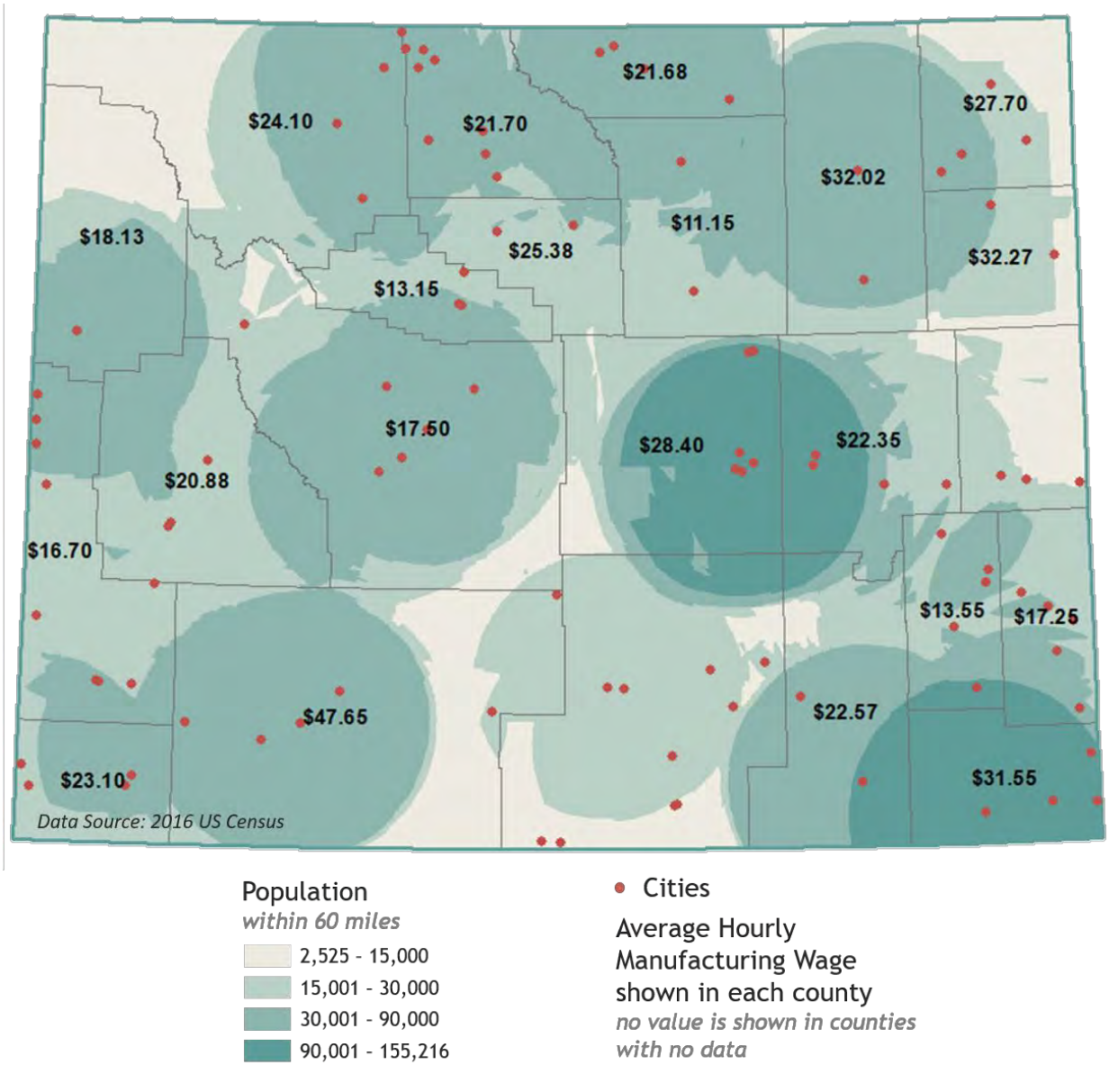
Infrastructure





Workforce

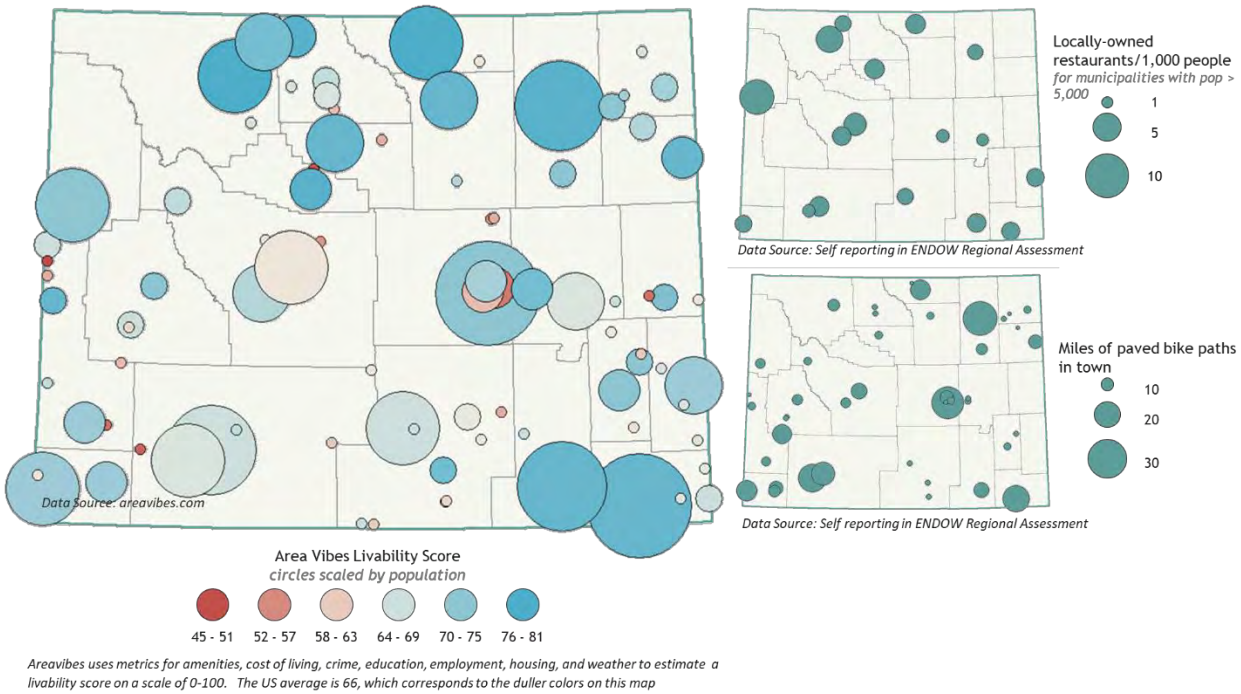
Population is a proxy for manufacturing workforce. According to site selector rules of thumb, employees are willing to drive a maximum of ~60 miles to work, and one new employee can be drawn from every ~300 people in a population.



Workforce Enablers

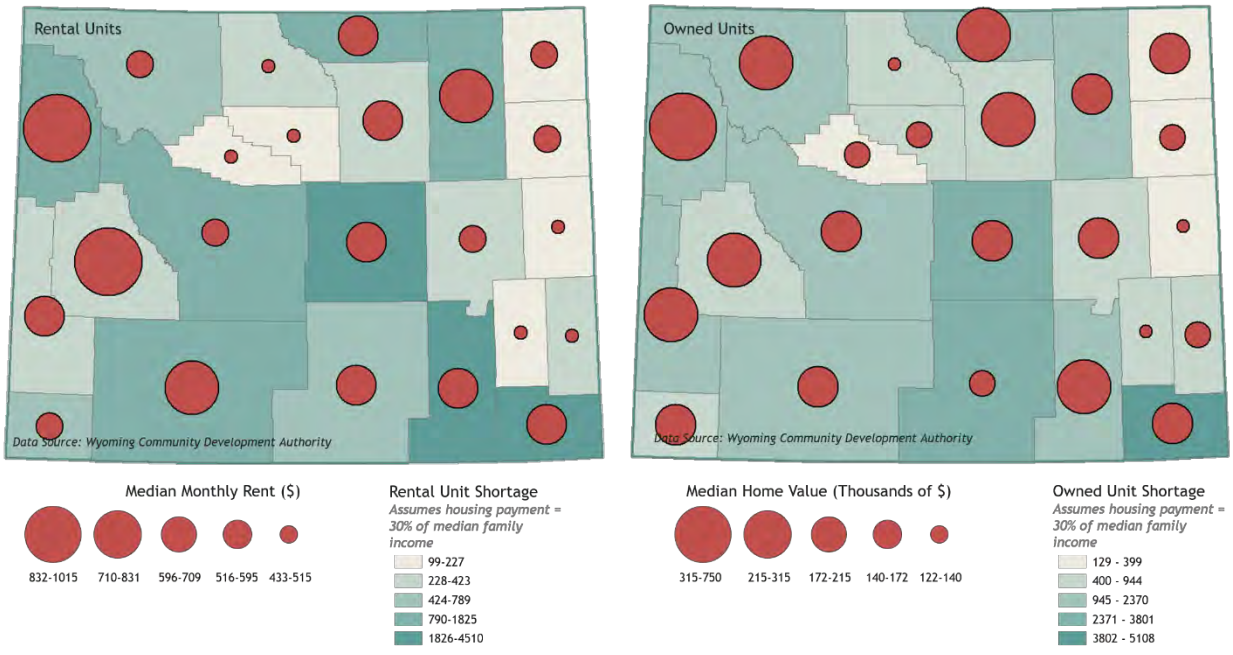
Livability and housing enable recruitment and retention of workforce.

Livability



Areavibes uses metrics for amenities, cost of living, crime, education, employment, housing, and weather to estimate a livability score on a scale of 0-100. The US average is 66, which corresponds to the duller colors on this map

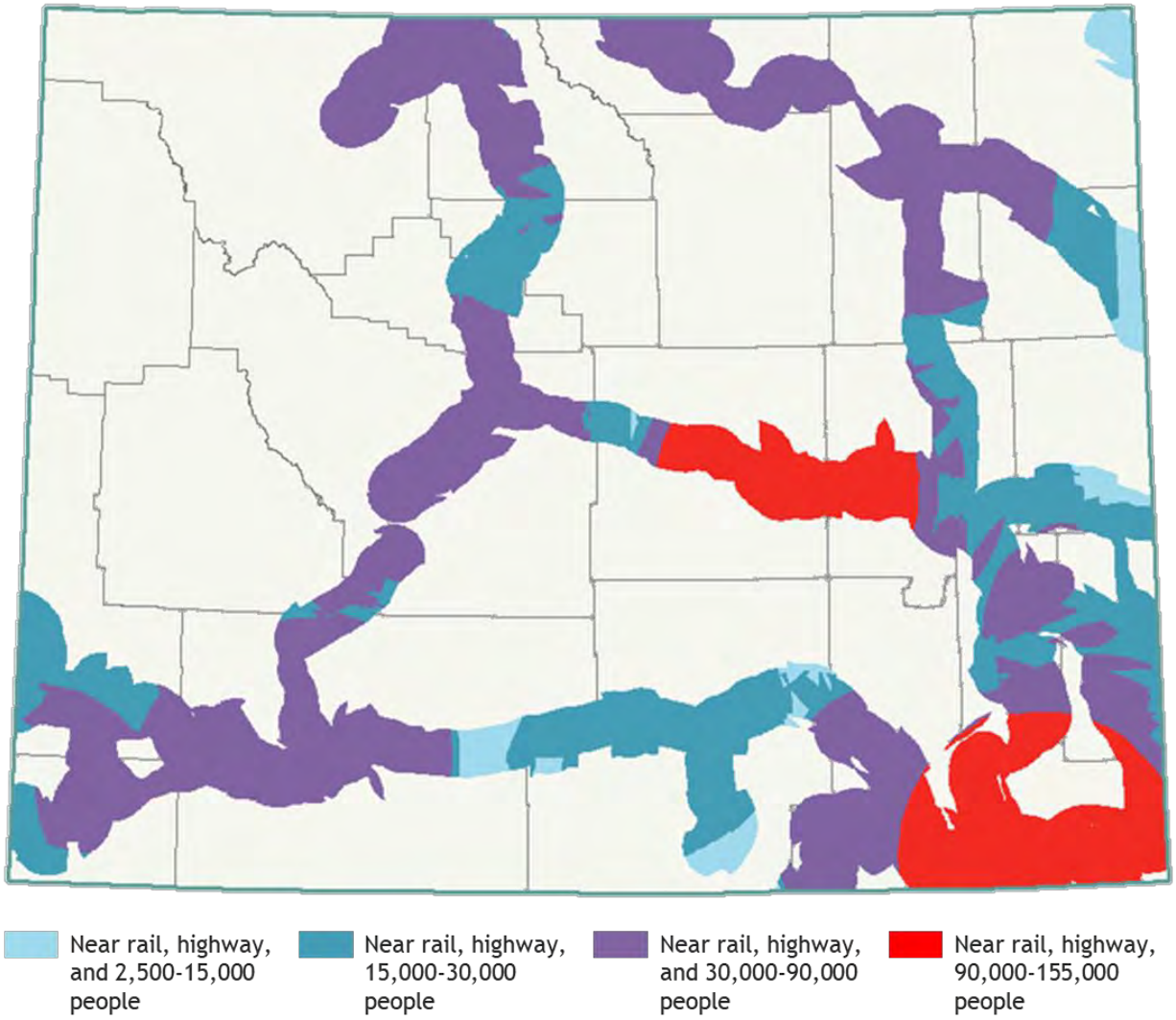
Housing



Industry Asset Intersections

Intersections amongst transportation and small, medium, large, and very large workforce. Important, but less critical assets are shown in previous maps.

Intersections shown below, sites within these areas, areas characterized by one or more input assets (e.g. workforce), or intersections amongst sectors may be considered potential business development and innovation zones. More focused analyses will be presented in the report submitted to the Legislature and Governor before December 31st, 2017.



Asset Mapping Conclusions

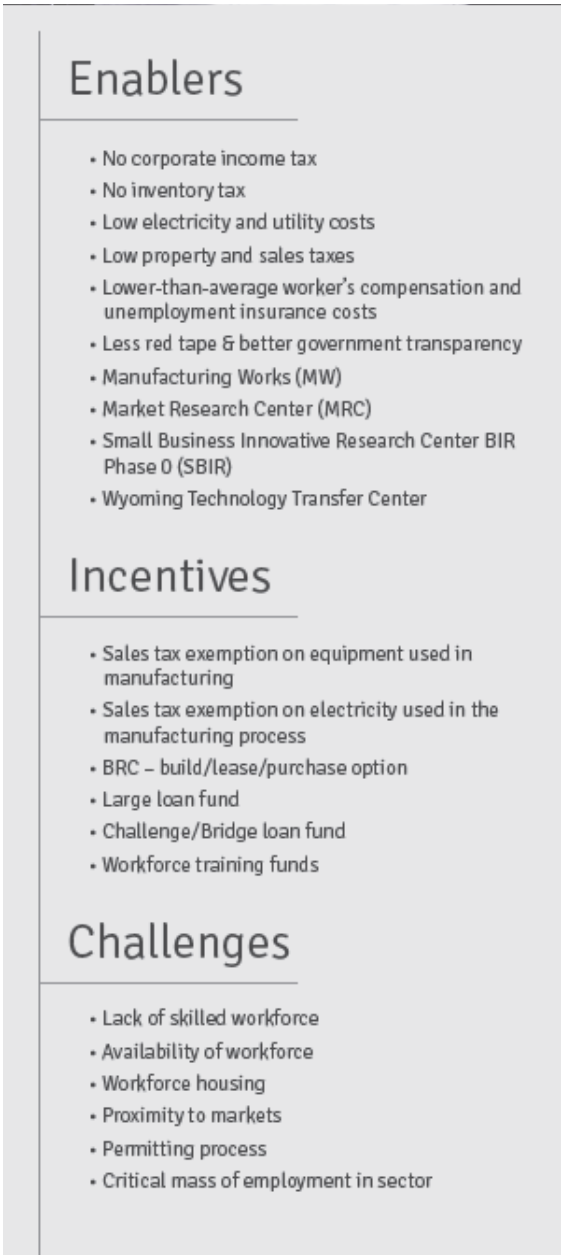
Manufacturing intersections are driven by access to transportation.

For large and very large manufacturing, workforce is a significant limitation in many areas in Wyoming.

Lack of air service and broadband is not necessarily prohibitive to manufacturers' success. However, these assets are important enablers. Both are limited in most areas where other manufacturing requirements are present.

Enablers

- Proximity to feedstock
- Established career pathways in some local economies – mines to manufacturing



Obstacles

Industry Input:

Market demand

-L&H Industrial

One of the largest obstacles to economic diversity in the state is the lack of available and sustainable air service.

-Pete Illoway

Opportunities

Industry Input:

Demand is increasing in mining

Increase sales in current product lines and add new product lines that utilize current capabilities manufacturing machines and components.

With manufacturing taking lower manpower manufacturing in Wyoming is practical as long as shipping and air service doesn't make the deliveries delays unacceptable.

-L&H Industrial

Value-added agriculture

Value-added minerals

Wholesale Trade (NAICS 42)

Summary of Sector

What Businesses are in the sector?

This sector comprises establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The merchandise described in this sector includes the outputs of agriculture, mining, manufacturing, and certain information industries, such as publishing.

Agriculture implements; coffee wholesaling; commercial compost; fabrics; farm product raw material merchant wholesalers; food and beverage equipment and supplies; food hub; food products; grocers; machinery, equipment and supplies merchant wholesalers; meat products.

Compare to US and other states

Wyoming lags behind the US average and surrounding states in this industry. Activities in this sector contributed 4.3% to Wyoming's GDP in 2016 compared to 6.1% for the US. Surrounding states Colorado, Idaho, Montana, South Dakota and Utah ranged from 5.1% to 7.5%. In 2016, Wyoming ranked 44th nationally for wholesale trade; it would rank 21st nationally if we grow our GDP to 6.1%.

Workforce

Wyoming wages within this sector pay better than the mean and median for all occupations. In Wyoming, however, wages are less than the US average, but pay more than some surrounding states including Idaho, Montana, New Mexico and South Dakota.

Enablers/Incentives/Challenges

Lack of market due to low population.

Extremely small, rural trade areas.

Significant leakage to out-of-state centers.

WalMart effect (big-box retail squeezing out other retail).

Amazon effect (online sales eroding traditional retail).

Significant competition (tradition and web presence).

Unskilled, entry-level workforce.

Industry Input and Comments: Industry did not respond

Emerging Trends

· Rise in implementation and use of connected robotics allows companies to gain efficiency and cut costs on the customer's factory floor, in the warehouse, and elsewhere.

· Wholesale distribution companies historically spent less time and effort in developing brand awareness to let customers know why they should choose their company; that is changing in favor of increased brand awareness efforts.

· Blockchain technology is allowing companies to make and verify transactions on networks in near real-time without a central point of control.

· E-commerce is morphing into digital commerce, which is not only a transaction, but a way of doing business. This includes branding, image, customer service and transactions.

· The amount of data produced today is increasing exponentially, allowing companies to analyze it and garner new insights about customers and themselves.

· Distributors have a twofold opportunity to capitalize on the internet of things. This includes sensors within the business, such as warehousing, transportation and equipment monitoring to improve operations.

· To reduce warehouse space, goods can be produced inside a mobile hub near the end customer, speeding delivery and always being in stock.

· While still in the early stages, drones and driverless vehicles will allow companies to address driver shortages, increase safety, lower shipping costs, and more. Drone technology has potential in many trades, but those focused on construction and similar markets can use drones to provide aerial imagery, coupled with data analytics and 3D modeling algorithms, can provide accurate measurements and material requirements.

Trends

- **Robotics and industrial connectivity:** With the rise in the implementation and use of connected robotics, companies look for ways to gain efficiency and cut costs on the customer's factory floor, in the warehouse, and elsewhere. This is a growing opportunity for wholesaler-distributors to keep manufacturing-customer plants running without interruption. Connected robotics can be used in manufacturing on the factory floor to final delivery of products to customers. For example, a European technology start-up is building a fleet of self-driving delivery robots designed to deliver goods locally within 30 minutes. Although they navigate autonomously, they are overseen by humans to avoid safety issues. The robots can deliver the equivalent of two bags of groceries to locations within five to 30 minutes from a local hub or outlet. Shoppers can track the robot in real time from an app and can schedule delivery at a time convenient for them. Only the app holder can unlock the robot to retrieve the groceries. This type of autonomous robot-delivery service opens new opportunities in point-to-point goods delivery.
- **Distributors as service providers:** The wholesale distribution industry has spent less time and effort in developing brand awareness than retailers, consumer packaged goods companies, manufacturers, and banks. However, this trend is changing. Companies need a clear, concise branding message that immediately tells the listener who the company is, what it does, who it serves and how it differs from competitors. For a company that tries to be everything to everyone, it is difficult— if not impossible — to let customers know why they should choose it instead of any number of another provider. A clear branding message is also a benefit in the recruiting.
- **Blockchain:** Is a technology that is emerging to permit companies to make and verify transactions on networks in near real-time without a central point of control. A blockchain is a chain of blocks of data linked to one another, constituting a time stamped, shared, authenticated database that contains the entire logged history of an asset. For distributors, the core of blockchain is the ability to provide a shared, secure record of exchange that can track what went into a product and who handled it, introducing transparency into supply chains, revealing the provenance of a product to everyone involved—from originator to end user, even if it has been through multiple manufacturing steps at different companies—and lastly, as goods change hands, to exchange payment between organizations.
- **Digital commerce:** E-commerce has been the focal point of technology discussions in the business world for many years, but that is changing. The ubiquitous influence of technology today has caused e-commerce to morph into digital commerce—which refers to more than a transaction, but a way of doing business. In the transition from product-centric to customer-centric world, a company's online presence takes center stage, becoming more than just a place to transact business, but a way of doing business including branding, image, customer service, and transactions.
- **Analytics:** The amount of data produced today is increasing exponentially, and technology is allowing companies to analyze massive amounts of that data to garner new insights about customers and themselves. In many cases, the analysis and insights can be used to generate new forms of differentiation that can be used to disrupt existing markets. For example, Amazon has gained a patent for what it calls "anticipatory shipping," a method to start delivering packages even before customers click "buy."
- **Internet of things:** Distributors have a twofold opportunity to capitalize on the internet of things. First, they can use sensors within the business, such as in warehousing, transportation,

and equipment monitoring to improve operations. Automating warehouse management and inventory is a prime example. By equipping stock bins with weight sensors that are programmed with the weight of the item in the bin, distributors can gain a real-time count of all stock. Furthermore, if an item is put away in the wrong bin, the system can alert the warehouse manager that the destination bin remains empty while the bin with the rogue item registers an incorrect weight.

- **Additive manufacturing:** Refers to adding successive layers of material to create an object. Closer to the wholesale distribution industry, companies are developing methods of 3D printing on-demand within mobile manufacturing hubs. To reduce warehouse space, goods can be reproduced inside a mobile hub near the end customer, speeding delivery and always being in stock.
- **Drones and driverless vehicles**
    - While still in the early stages, driverless-vehicle technology is advancing rapidly. Already, driver-assist capabilities are available in passenger cars (parking assist, blind spot detection, and lane-departure warnings). Companies are using these features in designing autonomous vehicles. Autonomous truck fleets could help address the shortage of truck drivers and provide other important benefits to distributors such as increased safety, reduced labor expenses, reduced fuel consumption and reduced Co2 emissions, lowering shipping costs and increasing delivery speed by overcoming driver regulations for sleep and rest.
    - Drone technology has potential in many lines of trade, but those focused on construction and similar markets are seeing early applications. A company uses drones to provide aerial imagery and, coupled with data analytics and 3D modeling algorithms, can provide accurate measurements and material requirements for construction, such as roofing.

Sources:

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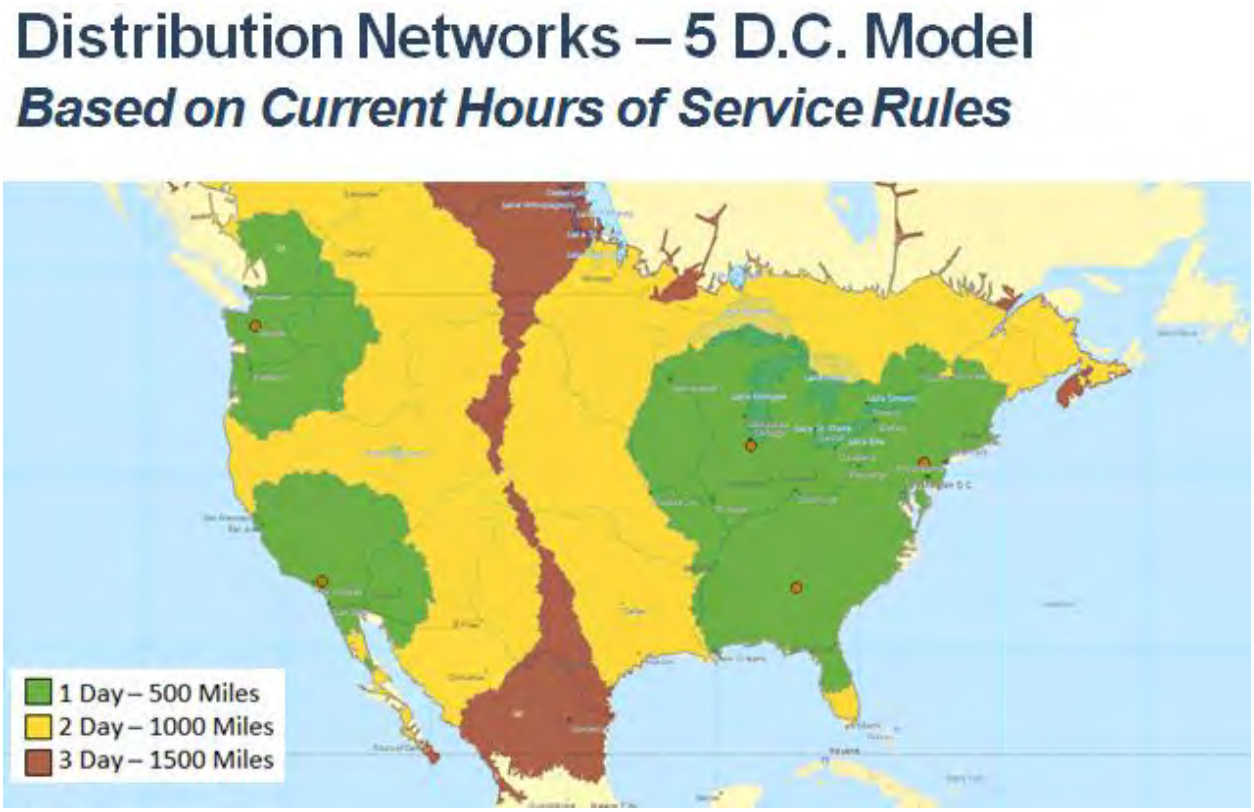
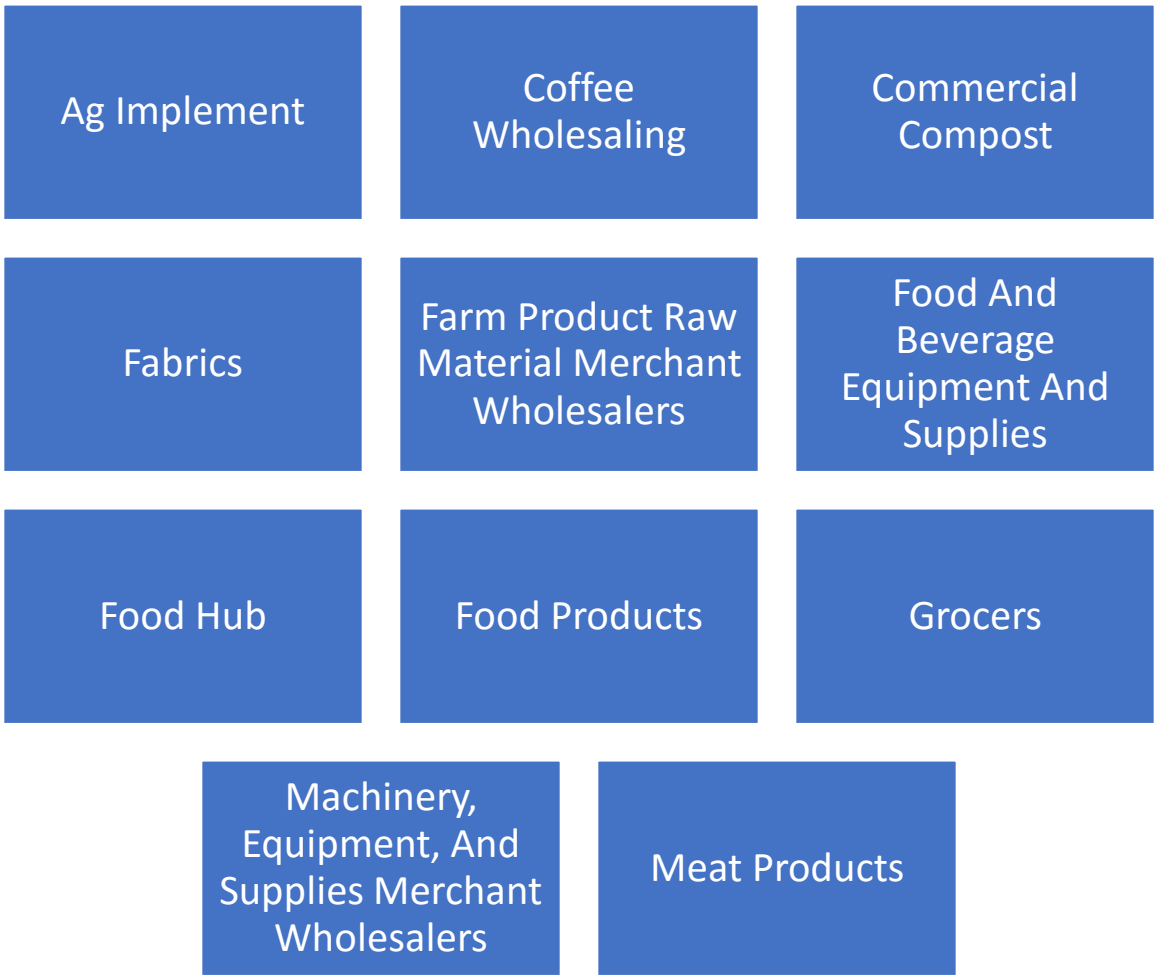
https://www.ibm.com/blogs/insights-on-business/consumer-products/developing-trends-wholesale-distribution-drones-driverless-vehicles/



Distribution Networks – 2 D.C. Model
Based on 24 x 7 Autonomous Vehicles

Industry Focus Around the State

Communities around the state have identified the following specific focus industries within the wholesale trade sector. This data was collected using the ENDOW Regional Assessment.

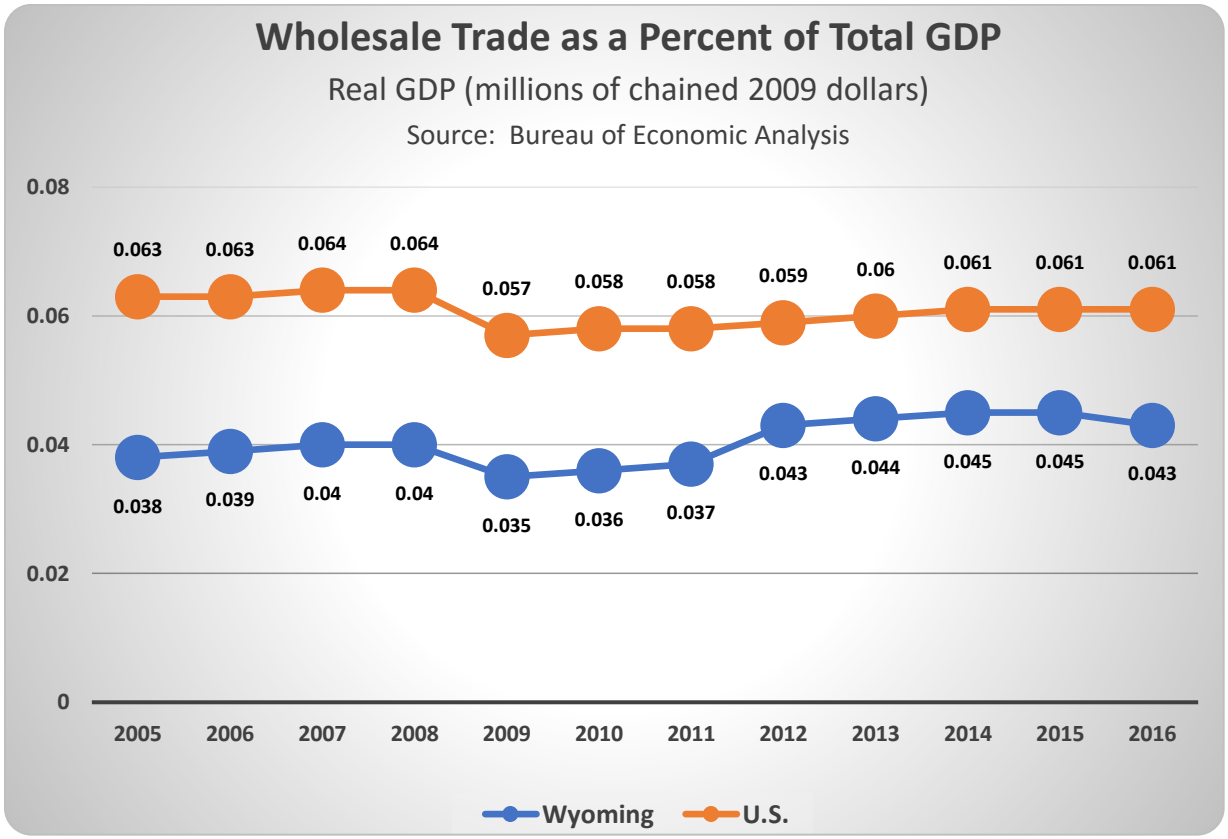


How does Wyoming compare?

WY Wholesale Trade as a % of Total GDP Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Wholesale Trade	% of Total GDP
2005	$29,637	$1,139	3.8%
2010	$36,469	$1,309	3.6%
2016	$34,439	$1,480	4.3%

U.S. Wholesale Trade as a % of Total GDP Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Wholesale Trade	% of Total GDP
2005	$14,203,241	$889,683	6.3%
2010	$14,628,165	$848,342	5.8%
2016	$16,342,925	$990,500	6.0607%

Source: Bureau of Economic Analysis



Over the next 20 years, if Wyoming increases the 4.3% Retail Trade GDP to equal the 6.1% GDP of the US, that 1.8% increase would equate to $620 million dollars.

Wyoming and United States Wholesale Trade Sector GDP

Real GDP (millions of chained 2009 dollars)

	2005				2010				2015			
Industry	**WY**		**U.S.**		**WY**		**U.S.**		**WY**		**U.S.**	
	GDP	**% of Total Wholesale Trade GDP**	**GDP**	**% of Total Wholesale Trade GDP**	**GDP**	**% of Total Wholesale Trade GDP**	**GDP**	**% of Total Wholesale Trade GDP**	**GDP**	**% of Total Wholesale Trade GDP**	**GDP**	**% of Total Wholesale Trade GDP**
Wholesale Trade	$ 1,139	100.0%	$ 889,683	100.0%	$ 1,309	100.0%	$ 848,342	100.0%	$ 1,609	100.0%	$ 983,610	100.0%

Source: Bureau of Economic Analysis

States with the Highest and Lowest Shares of Wholesale Trade, 2016

(as a Percentage of Their Gross State Product)

Top Five States

New Jersey	8.3%
North Dakota	8.2%
Texas	8.0%
Georgia	7.9%
Illinois	7.8%

Bottom Five States

Nevada	4.1%
Delaware	3.4%
Hawaii	3.2%
New Mexico	3.1%
Alaska	2.4%

In 2016, Wyoming ranked 44th in the nation at 4.3%

Wholesale Trade plays a significant role in our national economy, accounting for roughly 6.1 percent of the United States GDP. Wyoming would rank 21st in the nation for wholesale trade if we grow our GDP to 6.1 percent.

Percentage Wholesale Trade Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Wholesale Trade GDP	% of Total GDP
Wyoming	$1,480	4.3%
Alaska	$1,131	2.4%
Colorado	$16,180	5.5%
Idaho	$3,620	6.1%
Montana	$2,314	5.6%
New Mexico	$2,675	3.1%
North Dakota	$3,899	8.2%
South Dakota	$3,130	7.5%
Utah	$6,918	5.1%
United States	$990,500	6.1%

Source: Bureau of Economic Analysis

Percentage Wholesale Trade Contributes to Total Employment

2016

	Wholesale Trade Employment	% of Total Employment
Wyoming	8,496	3.1%
Alaska	6,422	2.0%
Colorado	104,909	4.1%
Idaho	28,324	4.1%
Montana	17,302	3.8%
New Mexico	21,422	2.7%
North Dakota	24,416	5.9%
South Dakota	21,174	5.0%
Utah	49,895	3.6%
United States	5,859,057	4.1%

Source: Bureau of Labor Statistics

Wyoming and United States Wholesale Trade Sector Establishments

	2005				2010				2016			
Industry	**WY**		**U.S.**		**WY**		**U.S.**		**WY**		**U.S.**	
Retail Trade	**#**	**% of Total Retail Trade**	**#**	**% of Total Retail Trade**	**#**	**% of Total Retail Trade**	**#**	**% of Total Retail Trade**	**#**	**% of Total Retail Trade**	**#**	**% of Total Retail Trade**
Merchant Wholesalers, Durable Goods	577	49.5%	257,649	42.8%	724	56.7%	249,343	40.6%	685	53.0%	253,427	41.1%
Merchant Wholesalers, Nondurable Goods	374	32.1%	141,647	23.5%	430	33.6%	136,274	22.2%	414	32.0%	138,982	22.5%
Electronic Markets and Agents and Brokers	214	18.4%	202,329	33.6%	125	9.8%	228,286	37.2%	195	15.1%	224,227	36.4%

Source: Bureau of Labor Statistics

Businesses in the Sector

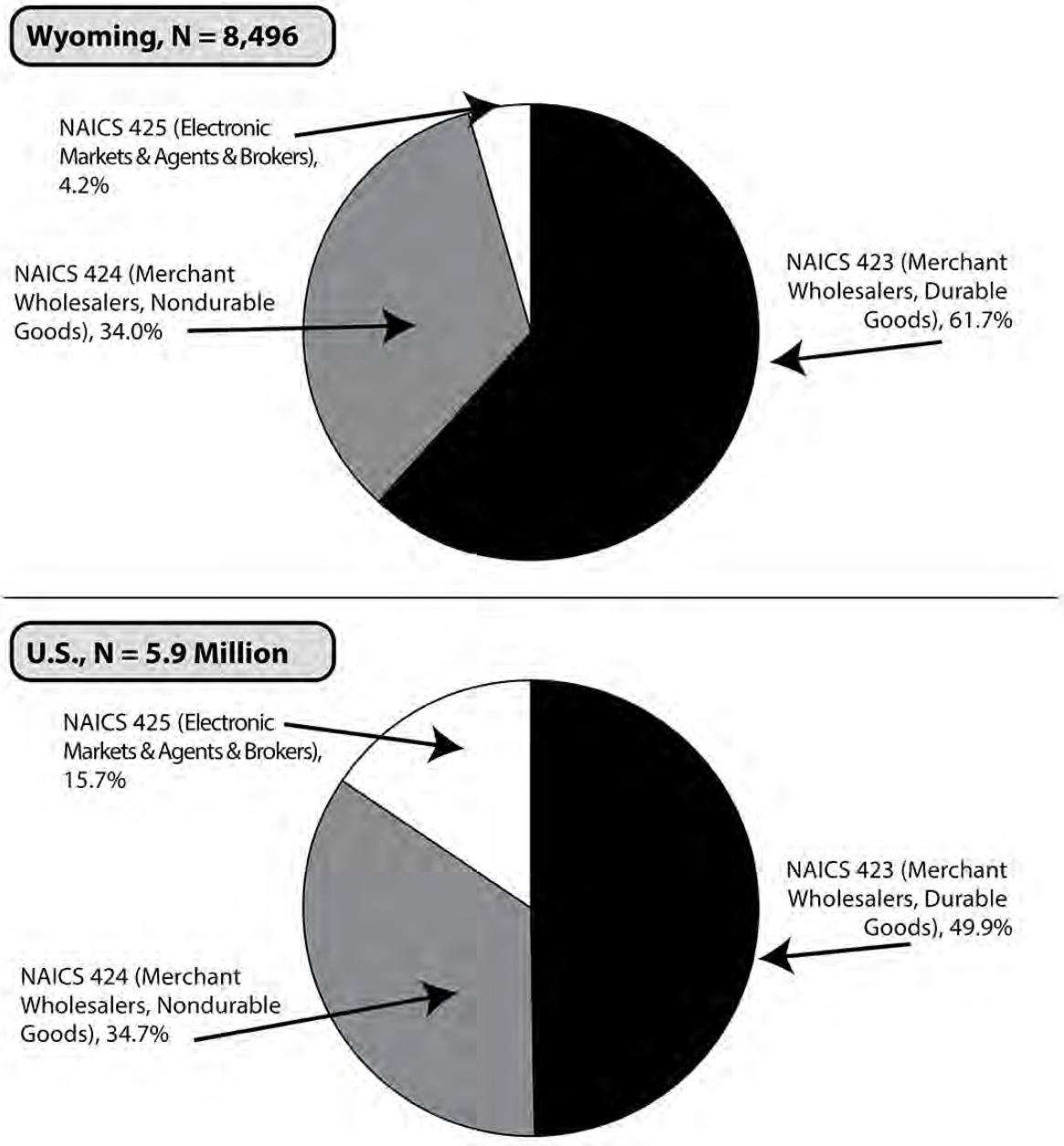
Firms in Wyoming	
Total Firms	1,442
Average Age	10
Number Firms Under 5 Years Old	618
Number Firms 5-9 Years Old	298
Number Firms over 10 Years Old	526

Wyoming and United States Firms, Employees and Annual Wage (2016)

		Wyoming			United States		
NAICS Code	Industry	Firms	Employees	Annual Wages	Firms	Employees	Annual Wages
42	Wholesale Trade	1,293	8,496	57,083	616,635	5,859,057	73,706
423	Merchant wholesalers, durable goods	685	5,245	60,634	253,427	2,926,333	72,423
424	Merchant wholesalers, nondurable goods	414	2,891	49,563	138,982	2,033,537	65,526
425	Electronic markets and agents and brokers	195	360	65,408	224,227	899,187	96,382

NAICS[a] 42: Wholesale Trade

Distribution of Jobs by 3-Digit NAICS Code in Wyoming and the U.S., 2016 Annual Average



[a]North American Industry Classification System.
Source: Quarterly Census of Employment and Wages. U.S. Bureau of Labor Statistics.
Prepared by T. Glover and M. Moore, Research & Planning, WY DWS, 7/21/17.

Workforce

Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	750	6,410	$44,923
Colorado	2005	12,443	93,779	$57,969
Idaho	2005	3,291	26,863	$38,798
Montana	2005	2,235	16,279	$38,076
New Mexico	2005	2,962	22,748	$41,245
North Dakota	2005	2,341	18,802	$40,122
South Dakota	2005	2,350	17,487	$39,862
Utah	2005	5,864	43,182	$46,676
Wyoming	2005	1,165	7,748	$43,447
US	2005	601,625	5,752,802	$55,261

State	Year	Firms	Employees	Annual Wage
Alaska	2010	712	6,271	$51,097
Colorado	2010	12,618	90,856	$68,123
Idaho	2010	3,297	25,833	$46,008
Montana	2010	2,320	15,654	$45,188
New Mexico	2010	3,028	21,896	$48,735
North Dakota	2010	2,322	21,056	$51,357
South Dakota	2010	2,353	18,571	$46,677
Utah	2010	5,796	44,033	$54,491
Wyoming	2010	1,278	8,460	$54,229
US	2010	613,903	5,466,463	$63,629

State	Year	Firms	Employees	Annual Wage
Alaska	2016	671	6,422	$55,918
Colorado	2016	13,241	104,909	$79,573
Idaho	2016	3,324	28,324	$56,339
Montana	2016	2,632	17,302	$54,986
New Mexico	2016	2,764	21,422	$52,085
North Dakota	2016	2,789	24,416	$62,747
South Dakota	2016	2,589	21,174	$57,054
Utah	2016	5,914	49,895	$63,997
Wyoming	2016	1,293	8,496	$57,090
US	2016	616,635	5,859,057	$73,706

Occupations in Wholesale Trade

Title	Mean Hourly	Mean Annual	Median Hourly	Median Annual
Total all occupations	$27	$56,271	$22	$46,551
Management Occupations	$58	$120,518	$45	$92,824
Top Executives	$60	$123,856	$46	$95,414
General and Operations Managers	$60	$124,032	$46	$95,422
Advertising, Marketing, Promotions, Public Relations, and Sales Managers	$46	$94,897	$39	$81,744
Sales Managers	$46	$95,676	$40	$82,598
Operations Specialties Managers	$56	$116,511	$42	$87,513
Business and Financial Operations Occupations	$47	$98,348	$30	$61,813
Cost Estimators	$29	$60,028	$28	$58,758
Market Research Analysts and Marketing Specialists	$26	$53,528	$26	$54,703
Financial Specialists	$35	$72,812	$32	$67,171
Accountants and Auditors	$35	$72,812	$32	$67,171
Computer and Mathematical Occupations	$24	$49,368	$22	$46,353
Computer Specialists	$24	$49,368	$22	$46,353
Computer User Support Specialists	$19	$40,181	$21	$43,042
Arts, Design, Entertainment, Sports, and Media Occupations	$20	$42,474	$14	$29,959
Art and Design Workers	$20	$42,474	$14	$29,959
Merchandise Displayers and Window Trimmers	$13	$26,497	$13	$26,916
Healthcare Practitioners and Technical Occupations	$33	$69,660	$27	$57,175
Building and Grounds Cleaning and Maintenance Occupations	$15	$30,776	$14	$28,736
Building Cleaning and Pest Control Workers	$15	$30,776	$14	$28,736
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$15	$30,776	$14	$28,736
Sales and Related Occupations	$32	$67,431	$25	$52,904
Supervisors, Sales Workers	$33	$68,898	$29	$60,915
First-Line Supervisors of Retail Sales Workers	$31	$64,400	$28	$57,329
First-Line Supervisors of Non-Retail Sales Workers	$34	$70,406	$30	$61,411
Retail Sales Workers	$18	$38,125	$18	$36,783
Cashiers	$13	$26,791	$11	$22,762
Counter and Rental Clerks	$17	$36,141	$17	$35,912
Parts Salespersons	$20	$42,339	$19	$40,285
Retail Salespersons	$14	$29,516	$11	$22,667
Sales Representatives, Wholesale and Manufacturing	$37	$76,959	$28	$58,576
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	$71	$146,684	$54	$112,778
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	$33	$69,519	$27	$56,547
Other Sales and Related Workers	$13	$27,592	$12	$25,748

Office and Administrative Support Occupations	$19	$38,736	$18	$36,820
Supervisors, Office and Administrative Support Workers	$26	$53,532	$24	$50,565
First-Line Supervisors of Office and Administrative Support Worke	$26	$53,532	$24	$50,565
Financial Clerks	$18	$38,176	$18	$36,743
Billing and Posting Clerks and Machine Operators	$19	$40,256	$19	$39,991
Bookkeeping, Accounting, and Auditing Clerks	$18	$37,630	$17	$35,836
Information and Record Clerks	$21	$43,536	$19	$38,883
Customer Service Representatives	$22	$45,671	$20	$40,778
Receptionists and Information Clerks	$14	$30,135	$14	$29,357
Material Recording, Scheduling, Dispatching, and Distributing Workers	$19	$38,928	$18	$36,430
Dispatchers, Except Police, Fire, and Ambulance	$30	$61,669	$28	$57,937
Shipping, Receiving, and Traffic Clerks	$16	$34,228	$17	$34,492
Stock Clerks and Order Fillers	$19	$39,512	$18	$36,847
Secretaries and Administrative Assistants	$17	$34,734	$16	$33,431
Secretaries and Administrative Assistants, Except Legal, Medical,	$17	$34,660	$16	$33,306
Other Office and Administrative Support Workers	$17	$36,130	$17	$35,798
Office Clerks, General	$17	$36,284	$17	$35,935
Construction and Extraction Occupations	$29	$60,241	$30	$62,247
Construction Trades Workers	$22	$45,204	$21	$44,209
Installation, Maintenance, and Repair Occupations	$28	$58,906	$29	$59,693
Supervisors of Installation, Maintenance, and Repair Workers	$36	$74,312	$36	$74,565
First-Line Supervisors of Mechanics, Installers, and Repairers	$36	$74,312	$36	$74,565
Electrical and Electronic Equipment Mechanics, Installers, and Repairers	$25	$52,118	$26	$54,736
Computer, Automated Teller, and Office Machine Repairers	$21	$44,332	$23	$47,921
Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	$29	$61,018	$31	$64,697
Automotive Service Technicians and Mechanics	$25	$51,299	$24	$50,392
Bus and Truck Mechanics and Diesel Engine Specialists	$31	$63,882	$33	$68,317
Farm Equipment Mechanics and Service Technicians	$21	$44,051	$22	$45,029
Mobile Heavy Equipment Mechanics, Except Engines	$31	$63,927	$32	$66,443
Other Installation, Maintenance, and Repair Occupations	$26	$54,189	$25	$51,336
Control and Valve Installers and Repairers, Except Mechanical Door	$18	$37,100	$18	$38,412
Industrial Machinery Mechanics	$28	$58,037	$27	$57,035
Maintenance and Repair Workers, General	$21	$43,150	$20	$42,117
Coin, Vending, and Amusement Machine Servicers and Repairers	$18	$38,247	$17	$35,956
Production Occupations	$23	$47,638	$22	$44,882

Supervisors, Production Workers	$38	$78,378	$37	$77,790
First-Line Supervisors of Production and Operating Workers	$38	$78,378	$37	$77,790
Metal Workers and Plastic Workers	$23	$48,807	$23	$47,073
Machinists	$25	$51,314	$23	$47,724
Welders, Cutters, Solderers, and Brazers	$23	$48,400	$23	$46,851
Other Production Occupations	$25	$51,476	$24	$49,764
Inspectors, Testers, Sorters, Samplers, and Weighers	$26	$54,201	$29	$59,901
Transportation and Material Moving Occupations	$18	$37,583	$18	$36,532
Supervisors, Transportation and Material Moving Workers	$27	$55,974	$27	$55,990
First-Line Supervisors of Helpers, Laborers, and Material Movers,	$25	$51,631	$24	$50,763
First-Line Supervisors of Transportation and Material-Moving Mach	$28	$58,456	$28	$57,275
Motor Vehicle Operators	$19	$38,867	$18	$38,126
Driver/Sales Workers	$16	$34,096	$16	$33,934
Heavy and Tractor-Trailer Truck Drivers	$21	$42,816	$20	$41,876
Light Truck or Delivery Services Drivers	$15	$32,048	$16	$32,233
Material Moving Workers	$16	$33,497	$15	$31,942
Industrial Truck and Tractor Operators	$17	$34,429	$15	$30,966
Cleaners of Vehicles and Equipment	$17	$34,356	$17	$34,737
Laborers and Freight, Stock, and Material Movers, Hand	$16	$33,358	$15	$31,985

Exports

No international exports from Wyoming, according to US Import and Export Trade Statistics

Enablers – Incentives - Challenges

Wholesale Trade

Enablers
Low sales taxes
Market Research Center (MRC)
Small Business Development Center (MRC)
Lower-than-average workers' compensation and unemployment insurance
Less red tape and barriers to entry (licensing, permitting, etc.)
Incentives
Challenge/Bridge Loan Program
Trade Show Incentive Grants
Challenges
Lack of market due to low population
Extremely small, rural trade areas
Significant leakage to out-of-state centers
WalMart effect (big-box retail squeezing out other retail)
Amazon effect (online sales eroding traditional retail)
Significant competition (tradition and web presence)
Unskilled, entry-level workforce

Retail Trade (44-45)

Summary of Sector

What businesses are in this sector?

Motor Vehicles, Furniture, Electronics, Building Materials, Food and Beverage, Health and Personal Care, Clothing, Gasoline, General Merchandise

Compare to US and other states

- Wyoming retail (5.8 percent of state GDP) trails U.S. by just .3 percent. Closing the gap could add $103M in revenue.
- Wyoming trails all neighbors (aside from Colorado, at 5.6 percent) slightly. Outliers Utah, S. Dakota and Idaho rely much more heavily on retail for revenue.
- Wyoming is ahead of the U.S. in many sectors of the Retail Industry, however finds itself notably behind in Food and Beverage (8 percent vs. 14 percent) Health and Personal Care (5.4 percent vs 10.5 percent) and Clothing (8.8 percent vs. 12.2 percent)

Workforce

- Wyoming lags the U.S. in annual wages in many retail sectors, significantly in electronics and appliances (31.7K vs 45.4K)
- In the industry as a whole, Wyoming finds itself in the middle of the pack amongst its neighbors, with Colorado as an outlier on the high end of annual wages.

Barriers and obstacles

- Retail tracks with GDP, so category share relies on poaching from big players, not expansion
- Small, scattered population means lack of market.
- Significant leakage to out-of-state centers (Billings, Rapid City, Fort Collins/Denver, Salt Lake)
- Amazon eating into big box market share. Big box market share eating into Main Street retail.

Opportunities

- Retail support technology
    - Augmented reality – try before you buy clothes, games and more
    - AI – chat bots, virtual agents offer customer service and support interactions
    - Robotic process automation for repetitive, rules-based, high-volume tasks
- Food and Beverage, Health and Personal Care and Clothing sectors of Retail Industry

Emerging Trends

- Growth will primarily come from emerging global markets.
- Diminishing importance of stand-alone brick and mortar stores represents both barrier and opportunity to small retailers
- Subscription-based services – groceries, prescriptions, etc.
- Customers now seek personalized brand interactions and engagements – think geotagged coupons, social media-tailored ads, etc.

Trends

Retail Industry Trends

Economy: Spending will remain confident, as personal income and home prices continue to increase. Competition will also continue to increase; digital opportunities have opened the door to new retailers and business models that fragment the market. Many companies are not actually competing specifically with Amazon, but with millions of tech-savvy third-party sellers who simply pay Amazon a commission in

order to take advantage of their distribution platform and consumer reach. In fact, Amazon's Marketplace is growing at twice the rate of Amazon direct. Businesses should consider:

Retail sales typically track GDP growth—so category share may be highly poachable rather than greatly expandable

Differentiation should likely focus on product uniqueness first and customer experience second

Expansion and growth is expected to come from emerging global markets, non-traditional channels and partnerships

Diminishing importance of stand-alone brick and mortar stores is expected give way to experiential engagement, mobile, social network, and on-demand commerce channels

Market share winners will possibly deliver both product uniqueness and enhanced customer experiences while reducing operating costs

Consumer Mindset

Marketing Mix: Product uniqueness can beat price, promotion, and placement.

Subscriptions: On-demand retail can feed instant gratification. Everything from pet dental chews and baby diapers to prescription medications are available for programmed delivery via online subscription-based services. Several national supermarket and health-wellness chains offer displays where shoppers are invited to try free samples of protein shakes, tea blends or appetizers before purchasing.

Interaction: Many customers seek personalized brand interactions and engagements that retailers could supply by using the right consumer insight in the right place and at the right time. Market campaigns and trade promotions likely need to be highly relevant, in-moment, and in alignment with a customer's current lifecycle.

Enabling Technology: A clear focus on operational excellence combined with the consumer's appetite and comfort level for technology adoption should likely dominate retailers' investments in customer experience management tools.

Augmented reality can supply buyers with an enhanced try before you buy experience such as in gaming, virtual dressing rooms, or real estate

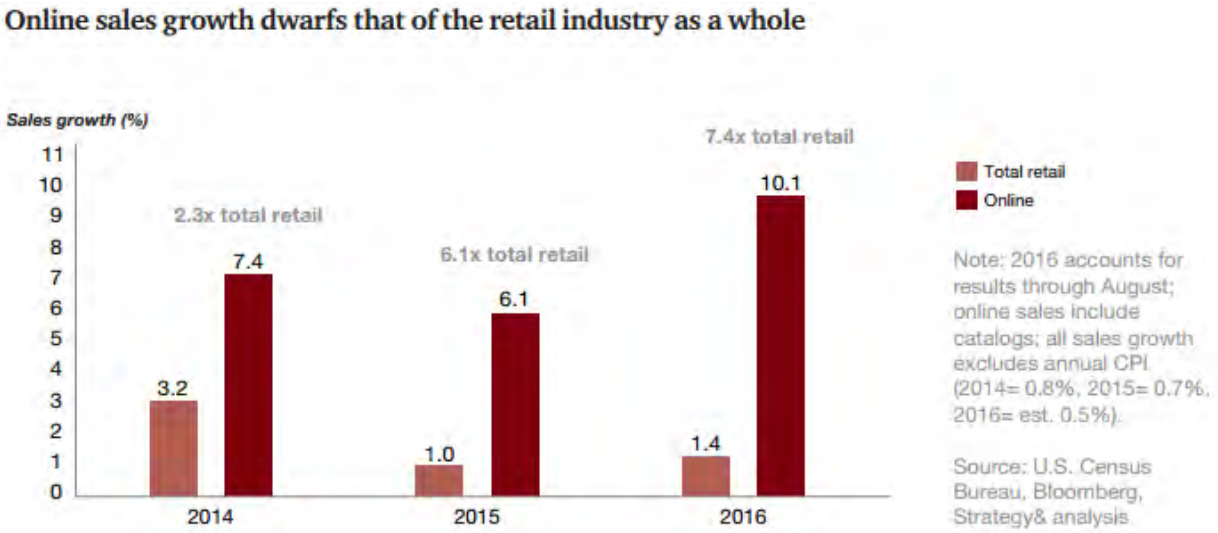
AI in the form of mobile or online virtual agents, webchat and chat-bots are better able to improve customer service and support interactions

Robotic process automation may provide significant operational cost reductions when applied to extremely repetitive, rules-based, high volume tasks that can be optimized such as customers' informational inquiries on products, pricing, return policies, or warranty terms

Wi-Fi signals bring the promise of geo-location based opportunities for trade promotions and other customer engagement techniques to both in-moment and in-store opportunities with great accuracy and relevance

Cognitive intelligence technologies may well supply greater visibility and decision support to demand and supply investments and procurement strategies combined with after sale customer experience monitoring

Platforms: As companies continue to invest heavily into providing direct-to-customer transactions, social networks are expected to evolve from branding, customer service, and marketing channels to retail channels. Similar to Amazon's One-Click purchase button, many social networks are positioned to function as an additional commerce "front door" for shoppers by enabling them to make a purchase via one click from within their social network. Retailing is more than brick and mortar, click and mortar, and point and click. Channel proliferation is a catalytic wake up call for retailers to envision new profit-sharing models and partnerships in order realize greater profits.



Sources:

https://www2.deloitte.com/content/www/us/en/pages/consumer-business/articles/retail-distribution-industry-outlook.html

https://www.strategyand.pwc.com/media/file/2017-Retail-Industry-Trends.pdf

Industry Focus Around the State

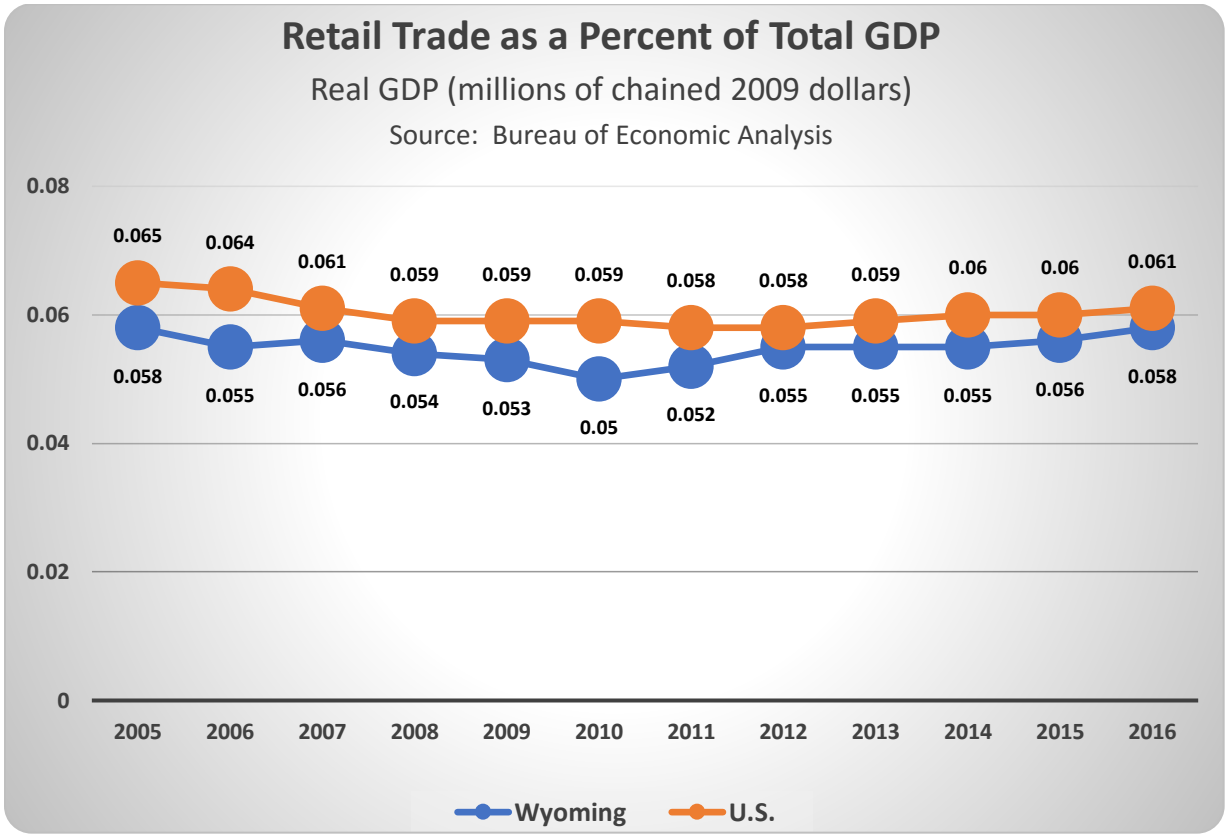
In the ENDOW Regional Assessment, communities did not specify specific focus industries within the retail trade sector. However, several communities identified the sector as a whole as an important focus in their area.

How does Wyoming compare?

WY Retail Trade as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Retail Trade	% of Total GDP
2005	$29,637	$1,717	5.8%
2010	$36,469	$1,834	5.0%
2016	$34,439	$1,997	5.8%

U.S. Retail Trade as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Retail Trade	% of Total GDP
2005	$14,203,241	$925,069	6.5%
2010	$14,628,165	$862,167	5.9%
2016	$16,342,925	$989,815	6.1%

Source: Bureau of Economic Analysis



Over the next 20 years, if Wyoming increases the 5.8% Retail Trade GDP to equal the 6.1% GDP of the US, that .3% increase would equate to $103 million dollars.

Wyoming and United States Retail Trade Sector GDP

Real GDP (millions of chained 2009 dollars)

	2005				2010			
Industry	WY		U.S.		WY		U.S.	
	GDP	% of Total Retail Trade GDP	GDP	% of Total Retail Trade GDP	GDP	% of Total Retail Trade GDP	GDP	% of Total Retail Trade GDP
Retail Trade	$ 1,717	100.0%	$ 925,069	100.0%	$ 1,834	100.0%	$ 862,167	100.0%

	2015			
Industry	WY		U.S.	
	GDP	% of Total Retail Trade GDP	GDP	% of Total Retail Trade GDP
Retail Trade	$ 2,014	100.0%	$ 969,407	100.0%
Source: Bureau of Economic Analysis				

States with the Highest and Lowest Shares of Retail Trade, 2016

(as a Percentage of Their Gross State Product)

Top Five States		Bottom Five States	
Idaho	8.9%	New York	5.1%
Maine	8.7%	Oregon	4.9%
Mississippi	8.7%	Delaware	4.5%
Washington	8.2%	Alaska	4.4%
Arizona	8.1%	Massachusetts	4.4%

In 2016, Wyoming ranked 35th in the nation at 5.8%

Retail Trade plays a significant role in our national economy, accounting for roughly 6.1 percent of the United States GDP. Wyoming would rank 29th in the nation for retail trade if we grow our GDP to 6.1 percent.

Percentage Retail Trade Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Retail Trade GDP	% of Total GDP
Wyoming	$1,997	5.8%
Alaska	$2,090	4.4%
Colorado	$16,456	5.6%
Idaho	$5,336	8.9%
Montana	$2,823	6.9%
New Mexico	$5,141	6.0%
North Dakota	$2,946	6.2%
South Dakota	$3,308	8.0%
Utah	$10,024	7.4%
United States	$989,815	6.1%

Source: Bureau of Economic Analysis

Percentage Retail Trade Contributes to Total Employment

2016

	Retail Trade Employment	% of Total Employment
Wyoming	30,664	11.3%
Alaska	37,026	11.4%
Colorado	269,103	10.5%
Idaho	84,486	12.3%
Montana	59,302	13.0%
New Mexico	93,123	11.5%
North Dakota	49,159	11.8%
South Dakota	53,772	12.8%
Utah	164,596	11.8%
United States	15,824,285	11.2%

Source: Bureau of Labor Statistics

Wyoming and United States Retail Trade Sector Establishments

	2005				2010				2016			
Industry	**WY**		**U.S.**		**WY**		**U.S.**		**WY**		**U.S.**	
Retail Trade	**#**	**% of Total Retail Trade**	**#**	**% of Total Retail Trade**	**#**	**% of Total Retail Trade**	**#**	**% of Total Retail Trade**	**#**	**% of Total Retail Trade**	**#**	**% of Total Retail Trade**
Motor Vehicle and Parts Dealers	358	13.4%	120,005	11.6%	362	14.3%	114,443	11.1%	332	13.7%	116,396	11.2%
Furniture and Home Furnishings Stores	147	5.5%	59,905	5.8%	138	5.4%	52,686	5.1%	130	5.4%	47,287	4.5%
Electronics and Appliance Stores	138	5.2%	53,945	5.2%	162	6.4%	49,815	4.9%	146	6.0%	47,618	4.6%
Building Material and Garden Supply Stores	255	9.5%	76,895	7.4%	243	9.6%	74,321	7.2%	247	10.2%	69,904	6.7%
Food and Beverage Stores	217	8.1%	138,998	13.4%	191	7.5%	140,926	13.7%	193	8.0%	145,734	14.0%
Health and Personal Care Stores	116	4.3%	80,593	7.8%	128	5.0%	96,989	9.4%	130	5.4%	109,761	10.5%
Gasoline Stations	376	14.1%	106,393	10.2%	335	13.2%	103,768	10.1%	302	12.5%	104,811	10.1%
Clothing and Clothing Accessories Stores	245	9.2%	129,593	12.5%	228	9.0%	130,119	12.7%	213	8.8%	126,771	12.2%
Sports, Hobby, Music Instrument, Book Stores	218	8.2%	61,424	5.9%	200	7.9%	57,988	5.6%	177	7.3%	51,980	5.0%
General Merchandise Stores	103	3.9%	47,616	4.6%	107	4.2%	52,432	5.1%	121	5.0%	62,011	5.9%
Miscellaneous Store Retailers	408	15.3%	129,155	12.4%	357	14.1%	114,895	11.2%	328	13.6%	113,047	10.8%
Nonstore Retailers	93	3.5%	34,065	3.3%	87	3.4%	38,055	3.7%	99	4.1%	47,302	4.5%

Source: Bureau of Labor Statistics

Businesses in the Sector

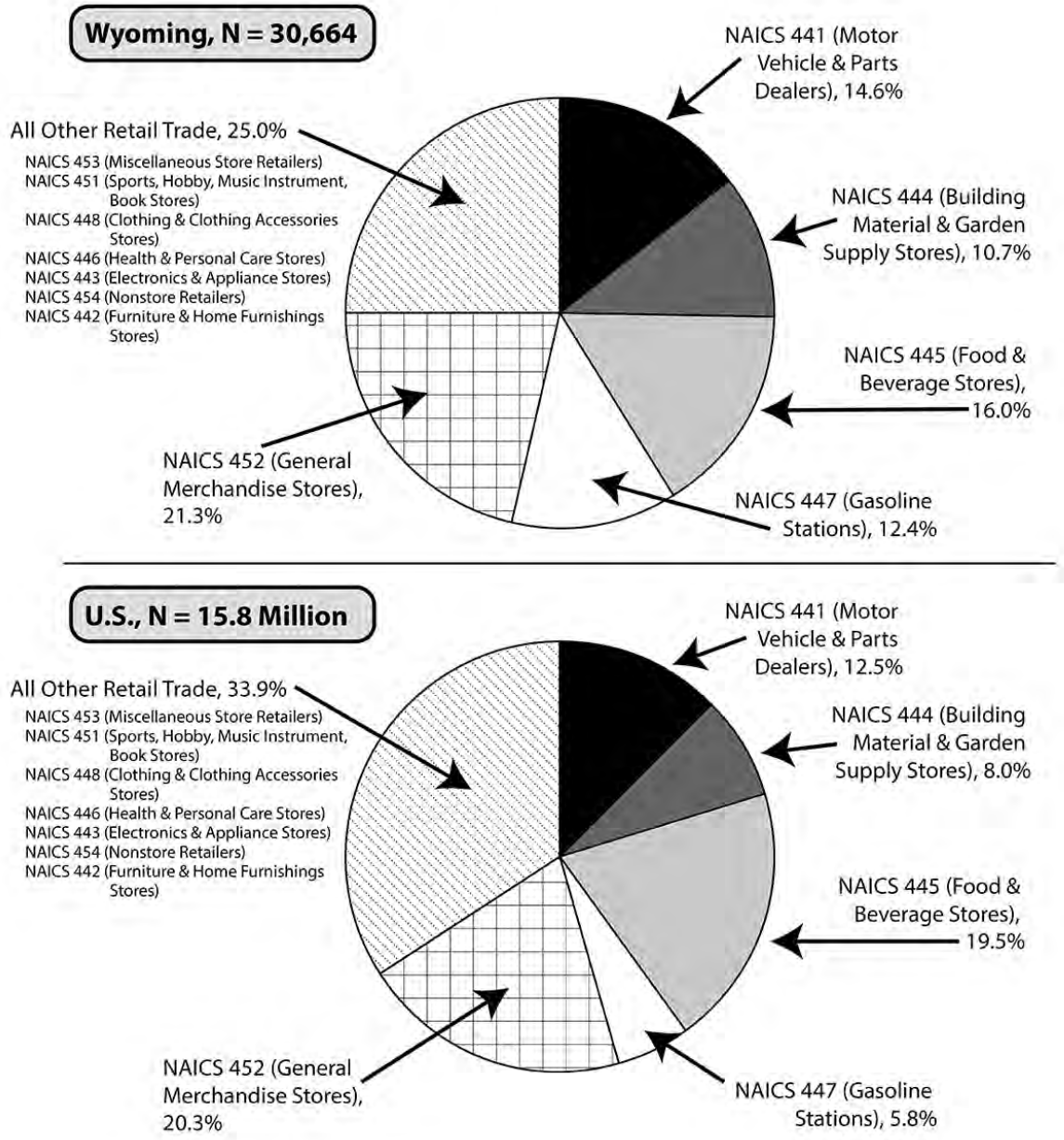
Firms in Wyoming	
Total Firms	2,600
Average Age	25
Number Firms Under 5 Years Old	868
Number Firms 5-9 Years Old	490
Number Firms over 10 Years Old	1,203

Wyoming and United States Firms, Employees and Annual Wage (2016)

		Wyoming			United States		
NAICS Code	Industry	Firms	Employees	Annual Wages	Firms	Employees	Annual Wages
44-45	Retail Trade	2,416	30,664	27,607	1,042,620	15,824,285	30,297
441	Motor vehicle and parts dealers	332	4,472	43,315	116,396	1,976,166	48,551
442	Furniture and home furnishings stores	130	721	30,130	47,287	468,469	35,584
443	Electronics and appliance stores	146	852	31,678	47,618	518,685	45,379
444	Building material and garden supply stores	247	3,290	29,222	69,904	1,270,868	32,746
445	Food and beverage stores	193	4,918	25,747	145,734	3,081,160	23,742
446	Health and personal care stores	130	923	33,976	109,761	1,049,564	38,027
447	Gasoline stations	302	3,793	21,204	104,811	920,894	20,832
448	Clothing and clothing accessories stores	213	1,353	18,886	126,771	1,341,901	21,773
451	Sports, hobby, music instrument, book stores	177	1,368	19,215	51,980	617,345	20,634
452	General merchandise stores	121	6,518	22,988	62,011	3,213,763	23,039
453	Miscellaneous store retailers	328	1,709	20,952	113,047	826,929	25,798
454	Nonstore retailers	99	748	42,485	47,302	538,539	59,568

NAICS[a] 44-45: Retail Trade

Distribution of Jobs by 3-Digit NAICS Code in Wyoming and the U.S., 2016 Annual Average



[a]North American Industry Classification System.
Source: Quarterly Census of Employment and Wages. U.S. Bureau of Labor Statistics.
Prepared by T. Glover and M. Moore, Research & Planning, WY DWS, 7/21/17.

Workforce

Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	2,494	35,755	$25,804
Colorado	2005	18,948	246,043	$25,395
Idaho	2005	5,943	76,825	$23,932
Montana	2005	4,742	55,367	$21,159
New Mexico	2005	6,345	94,012	$23,035
North Dakota	2005	3,227	42,116	$20,204
South Dakota	2005	4,031	49,275	$20,188
Utah	2005	8,927	135,357	$23,008
Wyoming	2005	2,673	30,353	$21,481
US	2005	1,038,585	15,256,340	$24,930

State	Year	Firms	Employees	Annual Wage
Alaska	2010	2,375	35,430	$28,214
Colorado	2010	17,417	236,725	$26,823
Idaho	2010	6,079	74,954	$24,860
Montana	2010	4,625	54,661	$24,193
New Mexico	2010	6,463	89,815	$25,167
North Dakota	2010	3,028	43,496	$24,159
South Dakota	2010	3,902	49,535	$23,076
Utah	2010	8,797	137,950	$25,983
Wyoming	2010	2,538	29,491	$25,167
US	2010	1,026,437	14,481,324	$26,651

State	Year	Firms	Employees	Annual Wage
Alaska	2016	2,322	37,026	$30,699
Colorado	2016	17,805	269,103	$30,619
Idaho	2016	6,006	84,486	$29,587
Montana	2016	4,629	59,302	$28,303
New Mexico	2016	6,244	93,123	$28,001
North Dakota	2016	3,140	49,159	$30,272
South Dakota	2016	3,904	53,772	$27,336
Utah	2016	9,892	164,596	$31,195
Wyoming	2016	2,416	30,664	$27,608
US	2016	1,042,620	15,824,285	$30,297

Occupations in Retail

Title	Mean Hourly	Mean Annual	Median Hourly	Median Annual
Total all occupations	$16	$32,794	$12	$25,806
Management Occupations	$49	$101,049	$38	$78,530
Top Executives	$49	$101,666	$37	$76,096
General and Operations Managers	$49	$101,303	$37	$76,008
Advertising, Marketing, Promotions, Public Relations, and Sales Managers	$51	$106,622	$45	$94,535
Sales Managers	$52	$107,596	$46	$95,375
Operations Specialties Managers	$40	$82,792	$37	$76,873
Administrative Services Managers	$39	$82,038	$31	$63,962
Financial Managers	$41	$85,067	$41	$85,300
Business and Financial Operations Occupations	$28	$57,191	$25	$52,258
Business Operations Specialists	$24	$50,023	$23	$47,330
Wholesale and Retail Buyers, Except Farm Products	$24	$49,794	$23	$46,977
Human Resources Specialists	$22	$46,468	$21	$43,378
Training and Development Specialists	$14	$28,766	$13	$27,807
Market Research Analysts and Marketing Specialists	$26	$54,004	$24	$50,921
Financial Specialists	$37	$76,811	$37	$76,104
Accountants and Auditors	$32	$66,774	$29	$60,743
Loan Officers	$42	$86,867	$39	$81,444
Network and Computer Systems Administrators	$26	$54,884	$25	$52,852
Arts, Design, Entertainment, Sports, and Media Occupations	$14	$29,737	$14	$28,776
Art and Design Workers	$14	$28,880	$14	$28,282
Floral Designers	$13	$27,731	$13	$27,313
Healthcare Practitioners and Technical Occupations	$32	$67,319	$20	$42,369
Health Diagnosing and Treating Practitioners	$56	$117,300	$57	$117,779
Pharmacists	$56	$117,300	$57	$117,779
Health Technologists and Technicians	$17	$35,577	$17	$34,885
Pharmacy Technicians	$16	$34,014	$17	$34,323
Opticians, Dispensing	$20	$42,185	$20	$42,277
Healthcare Support Occupations	$12	$23,944	$11	$23,364
Other Healthcare Support Occupations	$12	$23,944	$11	$23,364
Pharmacy Aides	$12	$23,944	$11	$23,364
Protective Service Occupations	$18	$37,486	$16	$34,152
Other Protective Service Workers	$15	$31,265	$15	$30,272
Security Guards	$15	$30,894	$14	$29,586
Food Preparation and Serving-Related Occupations	$11	$22,966	$10	$21,336
Supervisors, Food Preparation and Serving Workers	$15	$32,060	$15	$30,443
First-Line Supervisors of Food Preparation and Serving Workers	$15	$31,994	$14	$30,109
Cooks and Food Preparation Workers	$11	$23,597	$11	$22,998

Food Preparation Workers	$11	$23,893	$11	$23,321
Food and Beverage Serving Workers	$10	$21,222	$9	$19,429
Combined Food Preparation and Serving Workers, Including Fast Food	$10	$20,904	$9	$19,125
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	$11	$22,735	$10	$21,780
Waiters and Waitresses	$10	$21,613	$11	$21,830
Other Food Preparation and Serving Related Workers	$11	$22,470	$11	$22,779
Dishwashers	$11	$22,273	$11	$22,574
Building and Grounds Cleaning and Maintenance Occupations	$13	$26,059	$12	$24,391
Building Cleaning and Pest Control Workers	$12	$25,641	$12	$24,045
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$12	$25,641	$12	$24,045
Personal Care and Service Occupations	$15	$30,947	$12	$25,549
Animal Care and Service Workers	$10	$20,978	$10	$21,247
Nonfarm Animal Caretakers	$10	$20,651	$10	$20,559
Tour Guides and Escorts	$23	$48,204	$19	$38,605
Sales and Related Occupations	$14	$28,731	$11	$23,878
Supervisors, Sales Workers	$20	$40,788	$17	$36,183
First-Line Supervisors of Retail Sales Workers	$20	$40,768	$17	$36,187
First-Line Supervisors of Non-Retail Sales Workers	$21	$42,765	$17	$35,521
Retail Sales Workers	$13	$26,339	$11	$22,784
Cashiers	$11	$22,140	$10	$21,159
Counter and Rental Clerks	$20	$40,961	$17	$36,224
Parts Salespersons	$17	$34,855	$15	$31,148
Retail Salespersons	$14	$28,756	$11	$23,881
Sales Representatives, Services	$12	$25,341	$9	$19,128
Sales Representatives, Services, All Other	$12	$25,341	$9	$19,128
Sales Representatives, Wholesale and Manufacturing	$31	$63,635	$31	$65,127
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	$31	$63,635	$31	$65,127
Office and Administrative Support Occupations	$14	$29,548	$13	$27,167
Supervisors, Office and Administrative Support Workers	$22	$45,188	$19	$39,202
First-Line Supervisors of Office and Administrative Support Worke	$22	$45,188	$19	$39,202
Communications Equipment Operators	$12	$23,985	$11	$23,692
Switchboard Operators, Including Answering Service	$12	$23,985	$11	$23,692
Financial Clerks	$16	$34,183	$16	$32,763
Bill and Account Collectors	$18	$38,295	$18	$38,383
Billing and Posting Clerks and Machine Operators	$16	$34,213	$16	$33,966
Bookkeeping, Accounting, and Auditing Clerks	$16	$34,017	$16	$32,379
Information and Record Clerks	$14	$30,135	$14	$28,540
Customer Service Representatives	$14	$29,304	$13	$27,303
File Clerks	$15	$30,548	$14	$30,030

Loan Interviewers and Clerks	$18	$37,759	$16	$33,114
Order Clerks	$15	$31,678	$14	$29,529
Human Resources Assistants, Except Payroll and Timekeeping	$18	$36,643	$18	$36,889
Receptionists and Information Clerks	$13	$27,136	$13	$26,476
Material Recording, Scheduling, Dispatching, and Distributing Workers	$13	$26,332	$12	$24,394
Shipping, Receiving, and Traffic Clerks	$14	$29,203	$13	$26,483
Stock Clerks and Order Fillers	$13	$26,013	$12	$24,240
Secretaries and Administrative Assistants	$14	$30,067	$14	$29,488
Secretaries and Administrative Assistants, Except Legal, Medical,	$15	$31,013	$15	$30,222
Other Office and Administrative Support Workers	$16	$32,487	$15	$32,195
Office Clerks, General	$16	$33,593	$16	$33,325
Installation, Maintenance, and Repair Occupations	$19	$40,117	$17	$35,403
Supervisors of Installation, Maintenance, and Repair Workers	$29	$61,240	$29	$59,698
First-Line Supervisors of Mechanics, Installers, and Repairers	$29	$61,240	$29	$59,698
Electrical and Electronic Equipment Mechanics, Installers, and Repairers	$19	$40,394	$17	$35,869
Computer, Automated Teller, and Office Machine Repairers	$18	$36,446	$17	$35,255
Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	$19	$38,781	$17	$34,505
Automotive Body and Related Repairers	$22	$44,992	$21	$44,258
Automotive Service Technicians and Mechanics	$21	$44,220	$18	$38,467
Motorboat Mechanics and Service Technicians	$20	$41,594	$18	$38,092
Motorcycle Mechanics	$20	$41,257	$19	$39,046
Recreational Vehicle Service Technicians	$16	$32,760	$15	$31,593
Tire Repairers and Changers	$14	$28,252	$13	$27,011
Other Installation, Maintenance, and Repair Occupations	$16	$32,944	$15	$31,027
Home Appliance Repairers	$17	$34,713	$17	$35,437
Maintenance and Repair Workers, General	$16	$32,731	$15	$30,345
Helpers--Installation, Maintenance, and Repair Workers	$13	$26,788	$11	$23,530
Installation, Maintenance, and Repair Workers, All Other	$16	$33,181	$14	$30,038
Production Occupations	$14	$29,855	$14	$28,792
Supervisors, Production Workers	$20	$41,197	$20	$41,974
First-Line Supervisors of Production and Operating Workers	$20	$41,197	$20	$41,974
Assemblers and Fabricators	$15	$32,040	$14	$29,501
Assemblers and Fabricators, All Other	$15	$32,040	$14	$29,501
Food Processing Workers	$13	$27,851	$13	$27,820
Bakers	$12	$24,886	$11	$23,346
Butchers and Meat Cutters	$16	$32,351	$16	$33,282

Meat, Poultry, and Fish Cutters and Trimmers	$15	$30,214	$15	$31,030
Other Production Occupations	$18	$37,407	$16	$33,625
Painters, Transportation Equipment	$27	$56,979	$28	$58,195
Transportation and Material Moving Occupations	$14	$29,195	$13	$26,588
Supervisors, Transportation and Material Moving Workers	$26	$54,759	$27	$56,740
First-Line Supervisors of Helpers, Laborers, and Material Movers,	$24	$50,060	$24	$50,868
First-Line Supervisors of Transportation and Material-Moving Mach	$29	$59,438	$29	$59,505
Motor Vehicle Operators	$15	$31,211	$14	$29,512
Driver/Sales Workers	$16	$32,914	$15	$30,743
Heavy and Tractor-Trailer Truck Drivers	$21	$43,134	$20	$41,696
Light Truck or Delivery Services Drivers	$14	$29,365	$14	$28,653
Taxi Drivers and Chauffeurs	$10	$21,115	$9	$19,219
Other Transportation Workers	$14	$29,260	$14	$28,894
Automotive and Watercraft Service Attendants	$14	$29,866	$14	$29,652
Material Moving Workers	$13	$26,576	$12	$24,131
Industrial Truck and Tractor Operators	$15	$31,340	$15	$31,220
Cleaners of Vehicles and Equipment	$13	$26,090	$12	$24,250
Laborers and Freight, Stock, and Material Movers, Hand	$15	$30,356	$14	$28,473
Packers and Packagers, Hand	$10	$20,379	$9	$18,928

Exports

No international exports from Wyoming, according to US Import and Export Trade Statistics

Enablers, Incentives, Challenges

Retail Trade

Enablers
Low sales taxes
Market Research Center (MRC)
Small Business Development Center (MRC)
Lower-than-average workers' compensation and unemployment insurance
Less red tape and barriers to entry (licensing, permitting, etc.)
Strong tourism market brings new money into economy

Incentives
Main Street Program
Main Street Loan Program
Challenge/Bridge Loan Program

Challenges
Lack of market due to low population
Extremely small, rural trade areas
Significant leakage to out-of-state centers
WalMart effect (big-box retail squeezing out other retail)
Amazon effect (online sales eroding traditional retail)
Retail industry has very low margins to begin (1%-3%)
Lack of consolidated information for entrepreneurs
Significant competition (tradition and web presence)
Unskilled, entry-level workforce

Transportation and Warehousing (48-49)

Summary of Sector

What businesses are in this sector?

1,200 firms averaging 9-12 years depending and employing 9,500 people primarily in truck transportation (39 percent) but also warehousing and storage (29 percent)

Compare to US and other states

Transportation occupies more than twice the share of Wyoming's GDP as it does on a national level (6.2% v. 2.8%), and 150% to 300% more than regional neighbors. The percentage of total employment, however is more in line with regional neighbors and nearly identical to the U.S. share.

Workforce

Wages in this sector generally lag national averages, but the difference is particularly stark in air ($36K vs $84K) and pipeline ($94K vs $122K) transportation.

Barriers and obstacles

- Consolidation has yielded fewer and larger airlines, which often leaves rural airports behind. Low-cost and Ultra Low-Cost carriers continue to nibble away at market share from the established carriers, shrinking the difference between the three models.
- On the ground, Uber is expected to reach $42 billion in revenue by 2025 through both geographical expansion and other markets that involve moving something from A to B.
- Amazon has trained consumers to expect goods in hours, not days.
- Automation.

Opportunities

- Logistics as a service – companies able to provide software and analytics at various points along the supply chain can improve customer service and maximize efficiency for distributors.
- The consumer trend toward transparent order status means the industry is investing in new tech and partnerships.
- As consumers purchase products through ever more varied channels, new technology will be required to meet fulfillment and shipping challenges.

Emerging Trends

Automation, Uber disruption, airline consolidation

Trends

Transportation (Passenger)

- **Air Service**

- **Economy**: Stable, currently buoyed by low fuel costs and steadily increasing. These trends are not guaranteed for long term prosperity, but are offering financial legroom for companies today.
- **Technology**: Airlines, airports, and direct-to-consumer distributors — travel and lodging providers such as TripAdvisor, Google, and Airbnb, which recently announced its plan to expand beyond lodging and begin offering "experiences" — are all vying for pieces of business or recreational passenger budgets. The technology companies have an advantage in this battle: Consumers like the convenience of one-stop shopping on seamless digital platforms.
- **Market Positioning**: The once clear-cut competitive landscape in the commercial airline industry continues to evolve. Low-cost carriers (LCCs) and ultra-low-cost carriers (ULCCs) are still gaining market share from the dominant full-service carriers (FSCs). But the differences between the models are shrinking.
- **Consolidation**: A wave of consolidation has yielded fewer and larger airlines, and that seems to be enforcing more discipline concerning fare levels and capacity expansion. Airline executives must consider the most lucrative market position, and how to best construct the business that will inhabit it. Does the airline have the elements — that is, network, fleet, operating model, a reasonable cost-to-serve structure, digital capabilities, and the right partners — needed to thrive in the envisioned business environment? If not, how will those elements be obtained — through organic growth, consolidation, M&A, or joint ventures?
- **Customer Experience**: isn't a race in which every competitor pushes to be the first across a common finish line. It isn't a single volume knob that every competitor tries to turn "up to eleven." It's a landscape in which each competitor has its place— and for some, the right place isn't the most visibly intensive one.

- **Ground Transportation**

- **Uber:** Frost & Sullivan expects Uber to grow at a CAGR of 28.9%, reaching over $42 billion in revenue by 2025. This growth not only derives from geographical expansion, but from the exploration of other services that can evolve from the app. We've already seen Uber enter the food delivery market with UberEats and begin to explore the goods delivery market with UberRUSH. Paul Barter argues, "You think of Uber as a taxi disruptor now, but anything that moves from A to B… they can be in that business. When you want to predict the potential size of the Uber market, you don't just count up all the taxi businesses around the world – you count up anybody who provides services moving anything from A to B. Uber can enter all of those markets."

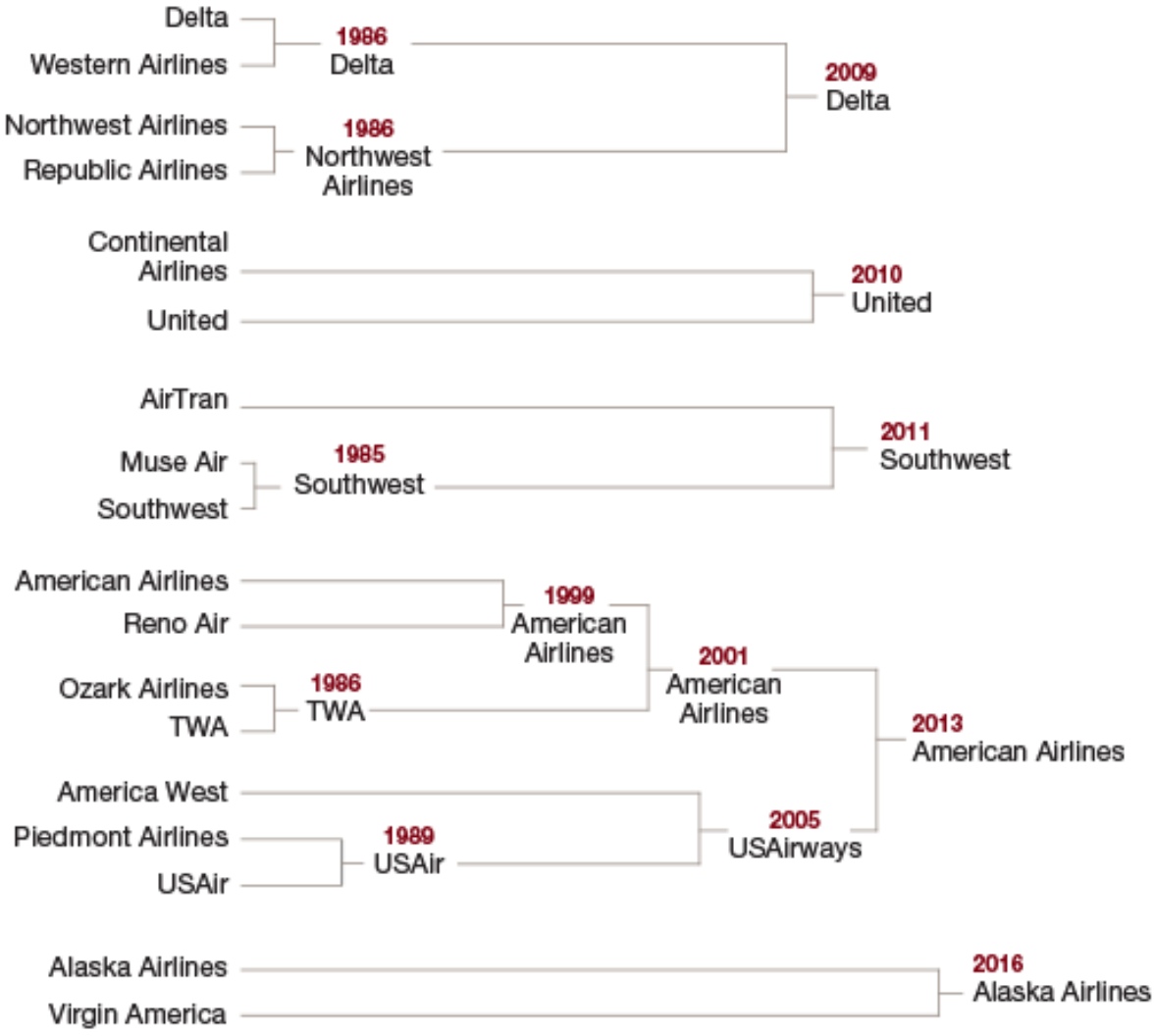
Sources:

https://www2.deloitte.com/us/en/pages/consumer-business/articles/airline-customer-experience.html

https://www.strategyand.pwc.com/trend/2017-commercial-aviation-trends

https://www.marsdd.com/news-and-insights/ride-sharing-the-rise-of-innovative-transportation-services/

Consolidation of airlines in the U.S. has shored up market share among the five largest U.S. carriers



Source: Company filings

Transportation (Freight)

- **Consumers**: Transportation and logistics will continue to be shaped by rising consumer expectations in 2017. Those who have grown up in the age of Amazon have an inherent desire to receive goods and services instantly—putting increased pressure on transportation and logistics companies to deliver goods exceptionally fast, and at the lowest price. Consumers now demand unprecedented visibility into order status, tracking and delivery, forcing the industry to invest in new technologies and partnerships.
- **E-Commerce:** Increasing consumer demands are fueled by the explosive growth of ecommerce. According to a survey by UPS, 51 percent of purchases were made online in 2016. Moreover, the phone is becoming the primary shopping device of consumers, according to PwC, meaning that they can literally shop anytime, anywhere. To compete, retailers must employ an omnichannel logistics strategy to deliver a seamless shopping experience. This inevitably introduces new supply chain, fulfillment and shipping challenges.
- **Supply Chain:** Omnichannel logistics lends itself to another trend that will be prevalent in 2017: the digital supply chain. Harnessing the power of the internet of things and data driven insights at various points along the supply chain offers huge potential to improve customer service and maximize efficiency. Big data and predictive analytics are empowering event-driven logistics that can account for external factors like natural disaster and war hazards which can help significantly reduce risk along the supply chain.
- **Automation:** The movement toward automation is drastically improving productivity. Amazon has already started experimenting with drones as a new form of express delivery and advancements in sensor technology have made autonomous vehicles a reality for 2017 and beyond. These automated solutions have the potential to increase safety, reduce risk, and significantly increase efficiency.
- **Logistics as a Service**: Overarching the broader industry is the movement towards cloud logistics that enables, "logistics–as-a-service" business models. Innovations in the cloud have improved control over supply chain processes with access to real-time information—allowing companies to be more agile in response to volatility or disruptive events. Meanwhile, this same technology facilitates flexible integrations with other key business processes to optimize all operations.

Sources:

http://www.netsuiteblogs.com/5-trends-driving-change-in-transportation-and-logistics-in-2017#sthash.H4tjrSmt.dpbs

https://www2.deloitte.com/us/en/pages/consumer-business/articles/rethinking-profitable-growth-efficiency-transportation-aviation.html

Global trends have a unique impact on each transportation sub-sector

Transportation sub-sector	1 Slow recovering demand	2 Sophisticated consumers	3 Volatile external forces
Airline cargo	• World air cargo traffic has grown at only 2.6% over the last 10 years, and future growth will be tightly tied to the global recovery[IV]	• Proliferation of online shopping has driven demand for faster shipping, which is presenting complex capability challenges for suppliers	• Managing ongoing volatility will remain a challenge, despite the recent drop in oil prices • The increase in extreme heat events could increase the number of cancelled flights and decrease payload capacity[VI]
Trucking / Logistics	• Low barriers to entry mixed with a positive demand outlook may increase participation and competition in the segment as the economy strengthens	• The rise of omnichannel, mass customization, and same-day delivery may require trucking suppliers to develop new capabilities—especially to win the last mile	• The rapidly changing energy landscape may erode the value of fuel-efficient fleet investments • The increase in heavy rain and flooding events could increase unexpected delays[VI]
Rail	• As global macroeconomic trends recover, rail suppliers may face added competition from other shipping modes as spending shifts from low cost solutions, like rail, to premium air and truck solutions	• As customers become increasingly reliant on real-time information, rail will need to continue to make investments in customer service capabilities	• The recent drop in fuel prices could boost margins in the short term, but may dampen the strong growth seen in oil transportation volumes[VII] • Increased rainfall and flooding boosts track maintenance costs and causes shipping delays[VI]
Maritime	• Less-than-expected global demand has led to an over-supply of ships and fleet under-utilization • Shipping freight rates continue to fall as Europe and Japan's economies falter[V]	• As with rail, customers will continue to demand real-time information necessitating customer service investments	• Customers switched to maritime shipping during the recession to save on cost, but if fuel prices remain low, maritime shipping's price advantage could erode • While sea shipping lanes will be open longer due to warmer temperatures, the levels of some fresh water passages are projected to drop, decreasing cargo capacity[VI]

Warehousing and Storage

- **Accountability:** The number of product recalls over the past few years has been staggering. Warehouses are deemed responsible for product quality complaints and are held accountable for tracking tainted distributed products. Increased protocols regarding product recall procedures and compliancy for auditing agencies require accurate databases to handle queries. Warehouses must also institute an instant product notification process to inform customers of the recalled products. Another aspect of warehouse accountability involves an increase in safety procedures for warehouse staff to prevent accidents. Forklift motion sensors, pedestrian motion sensors, and automated gate systems at crossing points are becoming instituted. Safety equipment adoption also involves the use of vision-guided tow vehicles in place of forklifts to lessen the chances of damaging products while increasing the amount of safety around moving warehouse vehicles.
- **Third Party**: Third-party outsourcing logistic solutions erupted into the market over a decade ago, as a warehouse manager couldn't turn around without finding a host of third-party logistics provider (3PL) companies offering their business cards. While this industry has dwindled in recent years as smaller 3PL companies are being devoured by larger competitors, their services are growing and becoming more sophisticated. Intermodal services are starting to be the norm, as these companies are offering a more full-service alternative. Warehouse managers are taking full advantage of this growing trend, shipping products to customers and stores at faster speeds and lower prices.
- **Mobile Devices:** We live in the age of mobility, and warehouse management has taken notice of this budding technology trend. Operators are using barcode scanners, RFID readers and other types of handheld devices to better streamline the shipping and inventory process. Several warehouse areas where mobility can benefit operations and processes include:
    - Inbound Products Processing: Mobile devices can provide real-time schedule updates, product shipment scanning, and cross-docking solutions.
    - Product Inventory Management: Warehouse operators are recognizing the benefits of mobile devices that can provide accurate inventory management information, cycle count orders and materials allocation handling.
    - Outbound Products Processing: Mobile devices can be used to view directed pick lists, dispatch plan tasks, and shipment tracking data.
- **Multi-Channel Solutions and Drop-Shipping:** Companies are no longer relying on just their own brick-and-mortar stores to entice customers with their products. E-commerce retailers are using multiple online buying channels to reach customers and fulfill orders. These companies require more scalable warehouse management solutions to ship products in the fastest time possible along the shortest shipping routes. An efficient warehouse management system (WMS) application has become vital for warehouses to stay on track with their inventory. This WMS can provide the right functionality to organize the fulfillment processes for multiple warehouses, oversee the distribution processes for drop ship partners, and help stores improve their overall product delivery times.
- **Automation**: Another popular trend this year has been the initiative of implementing more automated technology into warehouse management. Operators are evaluating operational processes to determine the best areas where tasks can be automated with the use of automation, and then moving warehouse personnel to other key areas where their skills and talent can lessen the burden of fulfillment processes. Mobility technologies, data systems,

conveyor belts and other automation and technology improvements can change lead times and increase delivery satisfaction.

Sources:

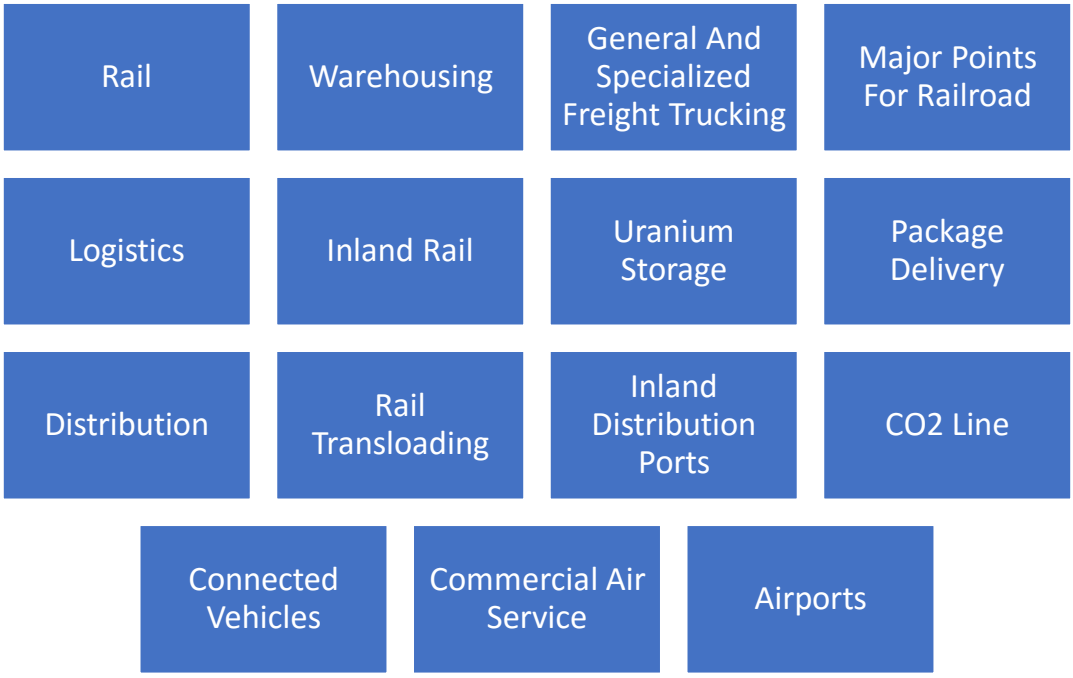
http://www.supplychainquarterly.com/topics/Warehousing/scq201005warehousing/

https://www.inddist.com/article/2015/11/top-5-warehouse-management-trends-2015

https://thedataweb.rm.census.gov/TheDataWeb_HotReport2/econsnapshot/2012/snapshot.hrml?NAICS=48-49

Industry Focus Around the State

Communities around the state have identified the following specific focus industries within the transportation and warehousing sector. This data was collected using the ENDOW Regional Assessment.

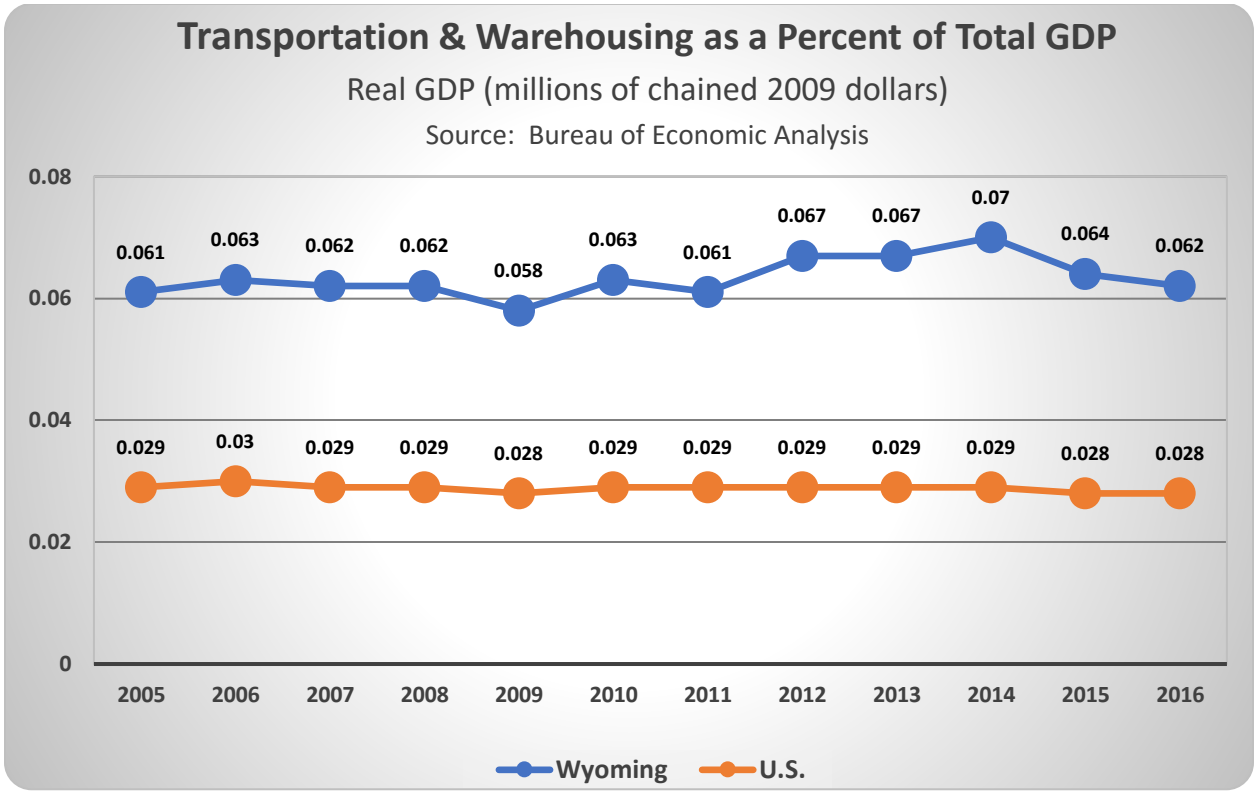


How does Wyoming compare?

WY Transportation and Warehousing as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Transportation and Warehousing	% of Total GDP
2005	$29,637	$1,820	6.1%
2010	$36,469	$2,292	6.3%
2016	$34,439	$2,149	6.2%

U.S. Transportation and Warehousing as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Transportation and Warehousing	% of Total GDP
2005	$14,203,241	$414,454	2.9%
2010	$14,628,165	$421,398	2.9%
2016	$16,342,925	$454,803	2.8%

Source: Bureau of Economic Analysis



Wyoming's Transportation GDP is 3.4% over that of the US.

Wyoming and United States Transportation and Warehousing Sector GDP

Real GDP (millions of chained 2009 dollars)

	2005				2010			
Industry	**WY**		**U.S.**		**WY**		**U.S.**	
	GDP	**% of Total Transportation and Warehousing GDP**	**GDP**	**% of Total Transportation and Warehousing GDP**	**GDP**	**% of Total Transportation and Warehousing GDP**	**GDP**	**% of Total Transportation and Warehousing GDP**
Air Transportation	$43	2.4%	$66,034	15.9%	$65	2.8%	$70,135	16.6%
Rail Transportation	$1,147	63.0%	$36,137	8.7%	$1,355	59.1%	$34,410	8.2%
Water Transportation	$1	0.1%	$5,568	1.3%	$4	0.2%	$13,918	3.3%
Truck Transportation	$333	18.3%	$126,229	30.5%	$424	18.5%	$119,805	28.4%
Transit and Ground Passenger Transportation	$38	2.1%	$29,084	7.0%	$39	1.7%	$27,360	6.5%
Pipeline Transportation	$114	6.3%	$12,737	3.1%	$212	9.2%	$17,315	4.1%
Other Transportation and Support Activities	$109	6.0%	$100,423	24.2%	$121	5.3%	$91,016	21.6%
Warehousing and Storage	$37	2.0%	$42,641	10.3%	$71	3.1%	$47,781	11.3%

Source: Bureau of Economic Analysis

	2015				
Industry	**WY**			**U.S.**	
	GDP	**% of Total Transportation and Warehousing GDP**		**GDP**	**% of Total Transportation and Warehousing GDP**
Air Transportation	$36	1.6%		$68,904	15.5%
Rail Transportation	$1,169	51.0%		$35,829	8.0%
Water Transportation	$3	0.1%		$15,833	3.6%
Truck Transportation	$416	18.1%		$126,370	28.3%
Transit and Ground Passenger Transportation	$29	1.3%		$27,458	6.2%
Pipeline Transportation	$405	17.7%		$20,496	4.6%
Other Transportation and Support Activities	$140	6.1%		$89,642	20.1%
Warehousing and Storage	$95	4.1%		$65,320	14.7%

States with the Highest and Lowest Shares of Transportation and Warehousing, 2016

(as a Percentage of Their Gross State Product)

Top Five States		Bottom Five States	
Alaska	9.5%	Vermont	1.6%
Nebraska	7.2%	Delaware	1.6%
Wyoming	6.2%	Massachusetts	1.5%
North Dakota	4.8%	Rhode Island	1.5%
Kentucky	4.6%	New Hampshire	1.3%

In 2016, Wyoming ranked 3rd in the nation at 6.2%

Transportation and Warehousing play an important role in our national economy, accounting for roughly 2.8 percent of the United States GDP.

Percentage Transportation and Warehousing Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Transportation and Warehousing GDP	% of Total GDP
Wyoming	$2,149	6.2%
Alaska	$4,516	9.5%
Colorado	$8,731	3.0%
Idaho	$1,618	2.7%
Montana	$1,682	4.1%
New Mexico	$1,991	2.3%
North Dakota	$2,283	4.8%
South Dakota	$934	2.2%
Utah	$4,485	3.3%
United States	$454,803	2.8%

Source: Bureau of Economic Analysis

Percentage Transportation and Warehousing Contributes to Total Employment

2016

	Transportation and Warehousing Employment	% of Total Employment
Wyoming	9,554	3.5%
Alaska	19,684	6.0%
Colorado	68,329	2.7%
Idaho	18,954	2.8%
Montana	12,038	2.6%
New Mexico	17,696	2.2%
North Dakota	16,411	3.9%
South Dakota	10,429	2.5%
Utah	51,154	3.7%
United States	4,765,276	3.4%

Source: Bureau of Labor Statistics

Wyoming and United States Transportation and Warehousing Sector Establishments

	2005				2010			
Industry	**WY**		**U.S.**		**WY**		**U.S.**	
Transportation and Warehousing	**#**	**% of Total Transportation and Warehousing**	**#**	**% of Total Transportation and Warehousing**	**#**	**% of Total Transportation and Warehousing**	**#**	**% of Total Transportation and Warehousing**
Air Transportation	33	3.51%	6,059	2.85%	31	3.12%	6,090	2.82%
Rail Transportation	1	0.11%	102	0.05%			96	0.04%
Water Transportation	1	0.11%	1,517	0.71%	1	0.10%	1,888	0.88%
Truck Transportation	635	67.63%	114,237	53.81%	651	65.49%	110,120	51.04%
Transit and Ground Passenger Transportation	37	3.94%	17,352	8.17%	42	4.23%	18,461	8.56%
Pipeline Transportation	38	4.05%	2,495	1.18%	51	5.13%	2,550	1.18%
Scenic and Sightseeing Transportation	4	0.43%	2,957	1.39%	5	0.50%	2,932	1.36%
Support Activities for Transportation	102	10.86%	38,198	17.99%	124	12.47%	41,183	19.09%
Postal Service	22	2.34%	748	0.35%	18	1.81%	868	0.40%
Couriers and Messengers	55	5.86%	15,048	7.09%	60	6.04%	16,425	7.61%
Warehousing and Storage	11	1.17%	13,598	6.40%	11	1.11%	15,152	7.02%
	939		212,309		994		215,764	

Source: Bureau of Labor Statistics

	2016				
Industry	**WY**			**U.S.**	
Transportation and Warehousing	**#**	**% of Total Transportation and Warehousing**		**#**	**% of Total Transportation and Warehousing**
Air Transportation	27	2.54%		5,804	2.41%
Rail Transportation				109	0.05%
Water Transportation	1	0.09%		2,065	0.86%
Truck Transportation	675	63.50%		125,666	52.27%
Transit and Ground Passenger Transportation	49	4.61%		20,474	8.52%
Pipeline Transportation	64	6.02%		2,863	1.19%
Scenic and Sightseeing Transportation	5	0.47%		3,083	1.28%
Support Activities for Transportation	144	13.55%		44,713	18.60%
Postal Service	15	1.41%		953	0.40%
Couriers and Messengers	65	6.11%		17,685	7.36%
Warehousing and Storage	19	1.79%		17,008	7.07%
	1,063			240,423	

Businesses in the Sector

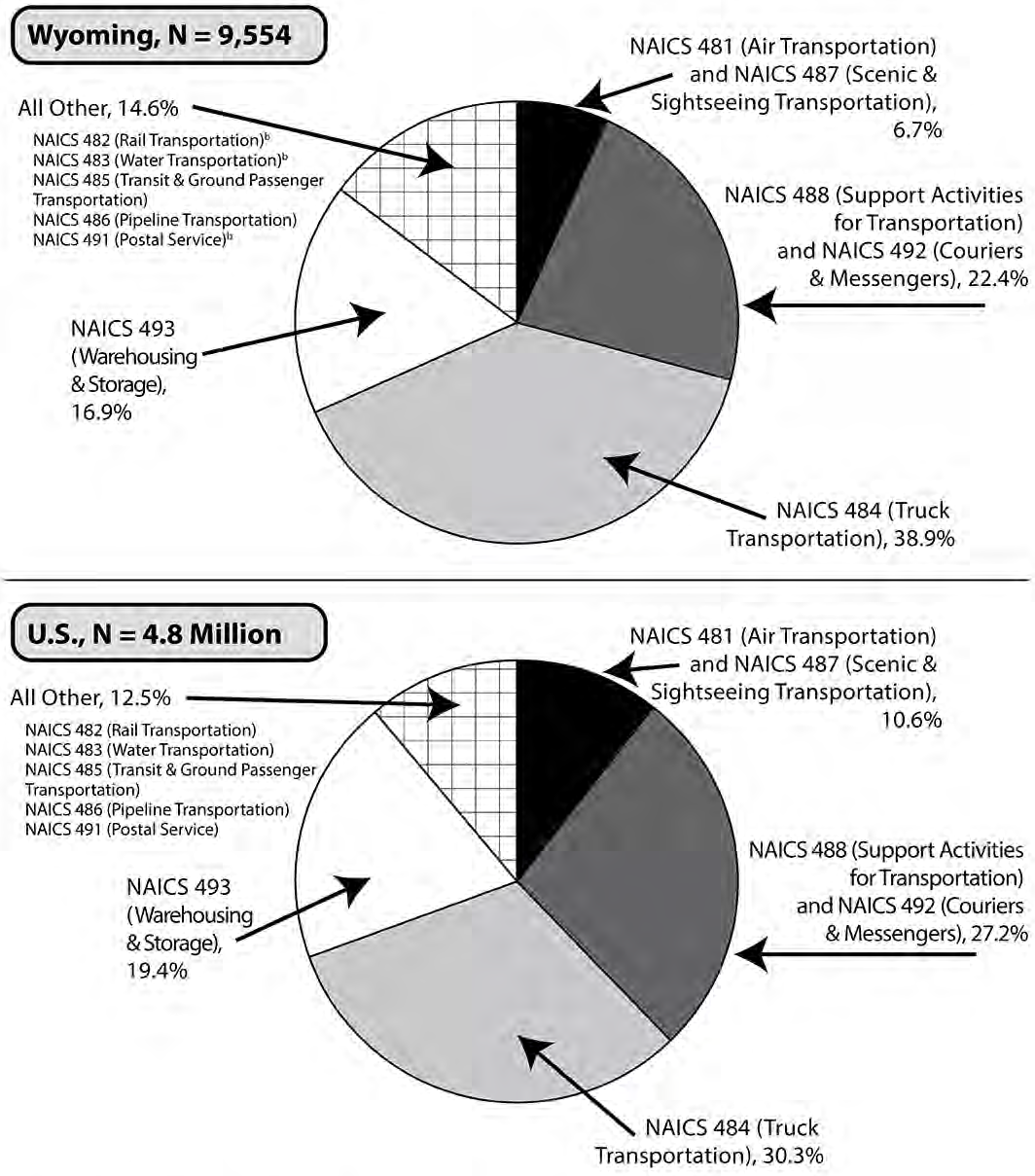
Firms in Wyoming	
Total Firms	1,194
Average Age	21
Number Firms Under 5 Years Old	534
Number Firms 5-9 Years Old	242
Number Firms over 10 Years Old	418

Wyoming and United States Firms, Employees and Annual Wage (2016)

		Wyoming			United States		
NAICS Code	Industry	Firms	Employees	Annual Wages	Firms	Employees	Annual Wages
48-49	Transportation and Warehousing	1,063	9,554	47,892	240,423	4,765,276	50,442
481	Air transportation	27	614	36,861	5,804	474,022	84,327
482	Rail transportation	0	0	0	109	594	48,370
483	Water transportation	1	0	0	2,065	65,003	83,484
484	Truck transportation	675	3,716	49,487	125,666	1,444,299	48,635
485	Transit and ground passenger transportation	49	581	24,425	20,474	473,634	30,152
486	Pipeline transportation	64	815	94,182	2,863	48,958	122,630
487	Scenic and sightseeing transportation	5	30	27,230	3,083	33,021	32,361
488	Support activities for transportation	144	1,150	48,913	44,713	660,281	53,225
491	Postal service	15	0	0	953	6,664	29,856
492	Couriers and messengers	65	988	42,115	17,685	633,683	45,354
493	Warehousing and storage	19	1,617	36,997	17,008	925,118	42,442

NAICS[a] 48-49: Transportation And Warehousing

Distribution of Jobs by 3-Digit NAICS Code in Wyoming and the U.S., 2016 Annual Average



[a]North American Industry Classification System.
[b]NAICS 482, 483, and 491 are not discloseable for Wyoming due to confidentiality.
Source: Quarterly Census of Employment and Wages. U.S. Bureau of Labor Statistics.
Prepared by T. Glover and M. Moore, Research & Planning, WY DWS, 7/21/17.

Workforce

Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	1,088	19,087	$47,680
Colorado	2005	3,615	61,102	$38,840
Idaho	2005	1,781	16,109	$30,531
Montana	2005	1,214	10,269	$31,079
New Mexico	2005	1,349	17,708	$35,627
North Dakota	2005	1,119	8,510	$32,871
South Dakota	2005	1,119	8,920	$31,398
Utah	2005	2,143	40,889	$37,304
Wyoming	2005	939	7,756	$35,582
US	2005	212,309	4,098,553	$39,514

State	Year	Firms	Employees	Annual Wage
Alaska	2010	1,062	18,826	$57,333
Colorado	2010	3,550	57,134	$42,741
Idaho	2010	1,802	16,653	$33,682
Montana	2010	1,314	10,420	$36,138
New Mexico	2010	1,382	15,824	$39,982
North Dakota	2010	1,266	11,054	$44,375
South Dakota	2010	1,234	9,372	$36,081
Utah	2010	2,188	40,942	$40,969
Wyoming	2010	994	8,866	$44,868
US	2010	215,764	3,943,659	$44,196

State	Year	Firms	Employees	Annual Wage
Alaska	2016	1,137	19,684	$62,702
Colorado	2016	3,992	68,329	$53,093
Idaho	2016	1,939	18,954	$38,913
Montana	2016	1,491	12,038	$41,445
New Mexico	2016	1,459	17,696	$43,980
North Dakota	2016	1,909	16,411	$58,070
South Dakota	2016	1,343	10,429	$42,592
Utah	2016	2,586	51,154	$47,852
Wyoming	2016	1,063	9,554	$47,897
US	2016	240,423	4,765,276	$50,442

Occupations in Transportation

Title	Mean Hourly	Mean Annual	Median Hourly	Median Annual
Total all occupations	$25	$50,956	$22	$46,785
Management Occupations	$55	$114,672	$45	$93,527
Top Executives	$68	$142,070	$52	$108,413
General and Operations Managers	$68	$141,913	$52	$107,871
Operations Specialties Managers	$48	$100,500	$47	$98,233
Transportation, Storage, and Distribution Managers	$47	$98,043	$47	$97,736
Other Management Occupations	$33	$68,657	$30	$62,089
Postmasters and Mail Superintendents	$28	$57,490	$29	$60,559
Business and Financial Operations Occupations	$33	$69,644	$31	$64,997
Business Operations Specialists	$32	$66,073	$30	$62,822
Human Resources Specialists	$31	$65,035	$28	$59,260
Training and Development Specialists	$22	$46,514	$19	$40,485
Business Operations Specialists, All Other	$41	$85,093	$38	$78,649
Financial Specialists	$41	$85,585	$40	$83,971
Accountants and Auditors	$36	$75,453	$38	$78,323
Computer and Mathematical Occupations	$27	$55,846	$28	$57,205
Computer Specialists	$27	$55,846	$28	$57,205
Architecture and Engineering Occupations	$37	$77,197	$34	$70,795
Engineers	$43	$89,551	$43	$89,682
Drafters, Engineering, and Mapping Technicians	$31	$64,681	$32	$66,188
Electrical and Electronics Engineering Technicians	$31	$64,979	$32	$66,189
Building and Grounds Cleaning and Maintenance Occupations	$17	$36,229	$15	$32,200
Building Cleaning and Pest Control Workers	$17	$36,386	$16	$32,561
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$17	$36,386	$16	$32,561
Sales and Related Occupations	$35	$73,626	$31	$65,151
Sales Representatives, Services	$36	$74,948	$32	$65,707
Sales Representatives, Services, All Other	$36	$74,948	$32	$65,707
Office and Administrative Support Occupations	$19	$39,117	$18	$36,790
Supervisors, Office and Administrative Support Workers	$24	$50,406	$24	$49,542
First-Line Supervisors of Office and Administrative Support Worke	$24	$50,406	$24	$49,542
Financial Clerks	$18	$37,759	$18	$36,909
Billing and Posting Clerks and Machine Operators	$17	$35,715	$17	$36,069
Bookkeeping, Accounting, and Auditing Clerks	$18	$37,332	$18	$36,409
Payroll and Timekeeping Clerks	$20	$42,565	$21	$43,246
Information and Record Clerks	$14	$30,116	$14	$29,772
Customer Service Representatives	$16	$33,803	$17	$34,433

Reservation and Transportation Ticket Agents and Travel Clerks	$14	$28,214	$14	$28,699
Material Recording, Scheduling, Dispatching, and Distributing Workers	$20	$40,950	$19	$38,619
Cargo and Freight Agents	$20	$40,815	$18	$37,015
Dispatchers, Except Police, Fire, and Ambulance	$17	$35,590	$13	$27,116
Postal Service Clerks	$21	$44,050	$20	$41,517
Postal Service Mail Carriers	$23	$48,488	$26	$53,508
Postal Service Mail Sorters, Processors, and Processing Machine Operators	$23	$48,783	$27	$56,213
Production, Planning, and Expediting Clerks	$25	$52,076	$28	$57,972
Shipping, Receiving, and Traffic Clerks	$13	$27,061	$12	$24,290
Secretaries and Administrative Assistants	$16	$33,847	$16	$33,954
Secretaries and Administrative Assistants, Except Legal, Medical,	$16	$33,126	$16	$33,466
Other Office and Administrative Support Workers	$17	$35,868	$16	$34,173
Office Clerks, General	$17	$35,588	$16	$33,832
Construction and Extraction Occupations	$28	$57,974	$27	$56,744
Construction Trades Workers	$27	$56,804	$27	$55,951
Operating Engineers and Other Construction Equipment Operators	$25	$51,118	$24	$49,736
Plumbers, Pipefitters, and Steamfitters	$33	$68,460	$33	$68,820
Installation, Maintenance, and Repair Occupations	$28	$57,209	$27	$56,085
Supervisors of Installation, Maintenance, and Repair Workers	$35	$72,854	$34	$71,404
First-Line Supervisors of Mechanics, Installers, and Repairers	$35	$72,854	$34	$71,404
Electrical and Electronic Equipment Mechanics, Installers, and Repairers	$33	$67,803	$33	$68,712
Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	$24	$50,368	$24	$49,966
Aircraft Mechanics and Service Technicians	$25	$51,836	$26	$54,432
Bus and Truck Mechanics and Diesel Engine Specialists	$22	$46,094	$22	$44,875
Rail Car Repairers	$26	$54,769	$26	$54,864
Other Installation, Maintenance, and Repair Occupations	$30	$62,533	$31	$63,492
Control and Valve Installers and Repairers, Except Mechanical Door	$39	$81,341	$41	$84,319
Industrial Machinery Mechanics	$36	$74,312	$36	$74,179
Maintenance and Repair Workers, General	$21	$44,410	$21	$44,193
Helpers--Installation, Maintenance, and Repair Workers	$17	$36,288	$18	$36,849
Installation, Maintenance, and Repair Workers, All Other	$24	$50,665	$24	$50,565
Production Occupations	$31	$63,439	$30	$62,586
Supervisors, Production Workers	$44	$90,648	$44	$92,244

First-Line Supervisors of Production and Operating Workers	$44	$90,648	$44	$92,244
Metal Workers and Plastic Workers	$26	$54,384	$27	$55,356
Welders, Cutters, Solderers, and Brazers	$25	$51,671	$23	$48,713
Plant and System Operators	$31	$63,657	$32	$67,196
Gas Plant Operators	$30	$61,993	$32	$67,297
Petroleum Pump System Operators, Refinery Operators, and Gaugers	$32	$66,686	$32	$66,971
Other Production Occupations	$30	$61,641	$30	$62,830
Inspectors, Testers, Sorters, Samplers, and Weighers	$28	$59,034	$29	$60,015
Transportation and Material Moving Occupations	$24	$48,879	$22	$46,152
Supervisors, Transportation and Material Moving Workers	$29	$59,317	$28	$57,764
First-Line Supervisors of Helpers, Laborers, and Material Movers,	$23	$47,405	$22	$45,562
First-Line Supervisors of Transportation and Material-Moving Mach	$30	$63,420	$30	$61,480
Commercial Pilots	NULL	$81,139	NULL	$77,663
Motor Vehicle Operators	$23	$47,578	$23	$47,091
Heavy and Tractor-Trailer Truck Drivers	$25	$51,445	$24	$49,993
Light Truck or Delivery Services Drivers	$23	$47,308	$21	$44,092
Taxi Drivers and Chauffeurs	$13	$26,057	$12	$25,346
Rail Transportation Workers	$29	$60,564	$28	$58,076
Railroad Brake, Signal, and Switch Operators	$26	$53,226	$26	$53,339
Railroad Conductors and Yardmasters	$29	$60,019	$28	$59,062
Other Transportation Workers	$31	$63,846	$27	$56,424
Transportation Inspectors	$41	$84,891	$38	$79,270
Transportation Workers, All Other	$18	$36,484	$18	$36,492
Material Moving Workers	$17	$35,076	$17	$34,932
Conveyor Operators and Tenders	$15	$30,617	$14	$29,520
Cleaners of Vehicles and Equipment	$18	$36,939	$20	$41,439
Laborers and Freight, Stock, and Material Movers, Hand	$15	$31,835	$15	$31,298
Gas Compressor and Gas Pumping Station Operators	$30	$62,024	$29	$61,040
Tank Car, Truck, and Ship Loaders	$18	$36,543	$17	$35,892

Exports

No international exports from Wyoming, according to US Import and Export Trade Statistics

Asset Maps

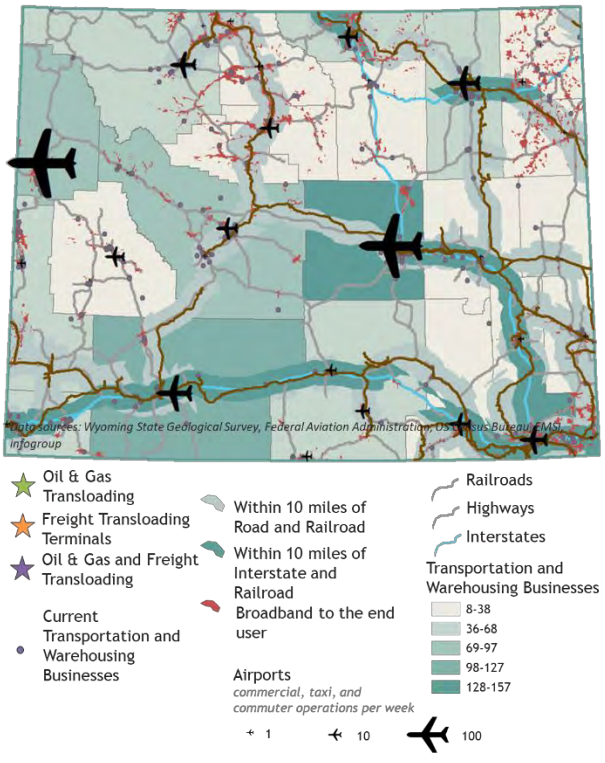
A baseline for delineating Business Development and Innovation Zones

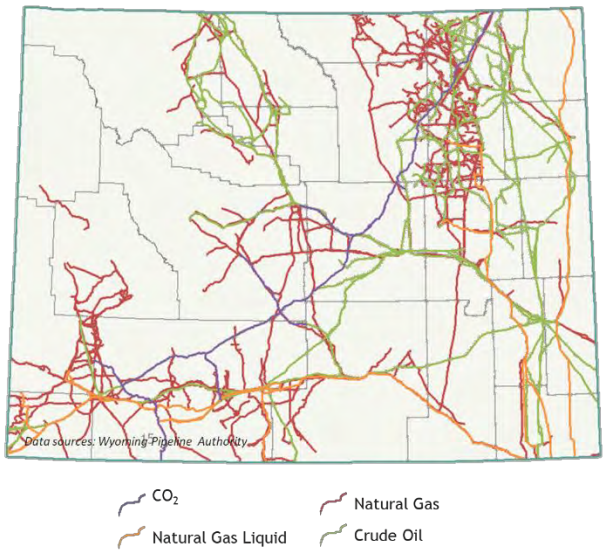
While maps in this section focus on the assets required to grow the Transportation and Warehousing sector, assets of companies within this industry are important requirements for other sectors, and are also represented in those sections.

Mappable Sector Assets

Infrastructure	Workforce
•Transportation •Rail •Road •Air •Pipelines •Wired Internet •Electricity •Current Businesses	•Numbers •Wages •Livability •Housing •Availability •Cost

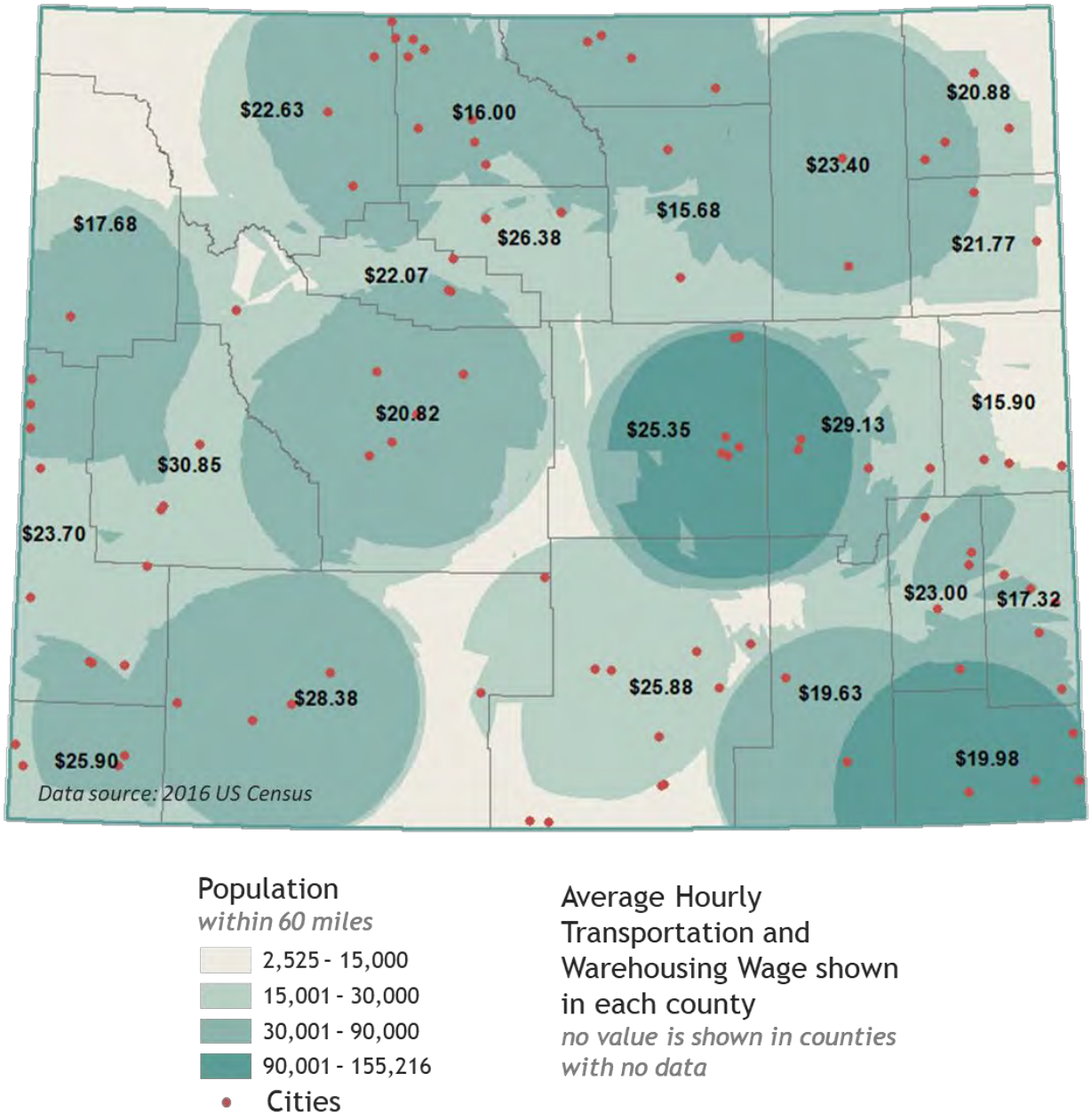
Infrastructure





Workforce

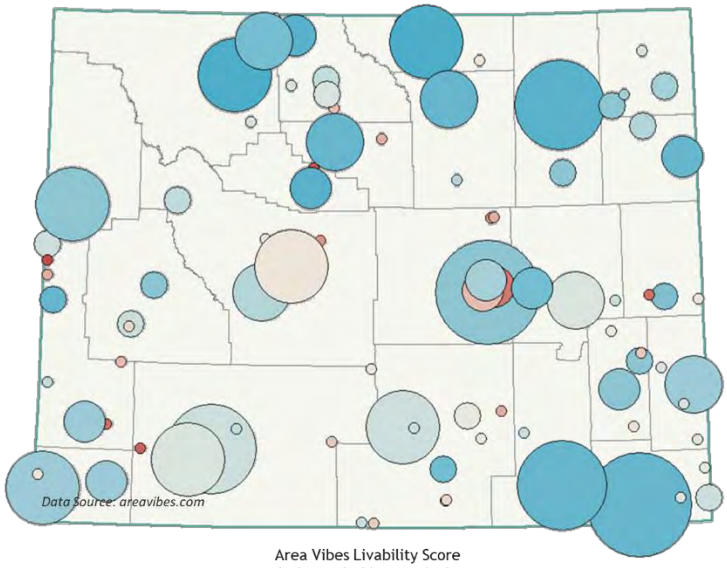
Population is a proxy for transportation and warehousing workforce. According to site selector rules of thumb, employees are willing to drive a maximum of ~60 miles, and one new employee can be drawn from every ~300 people in a population.

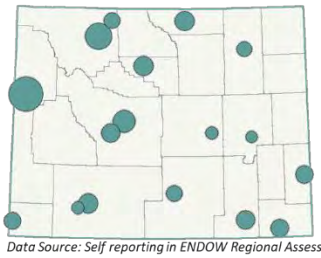


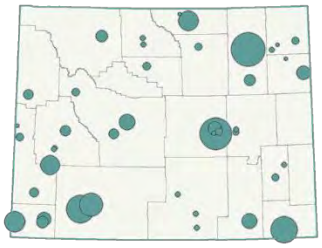
Workforce Enablers

Livability and housing enable recruitment and retention of workforce.

Livability





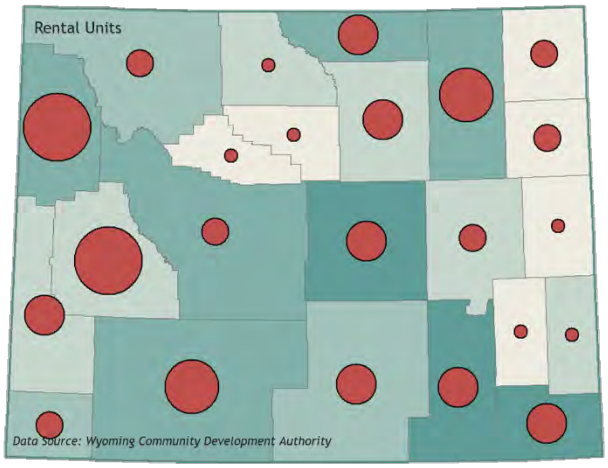


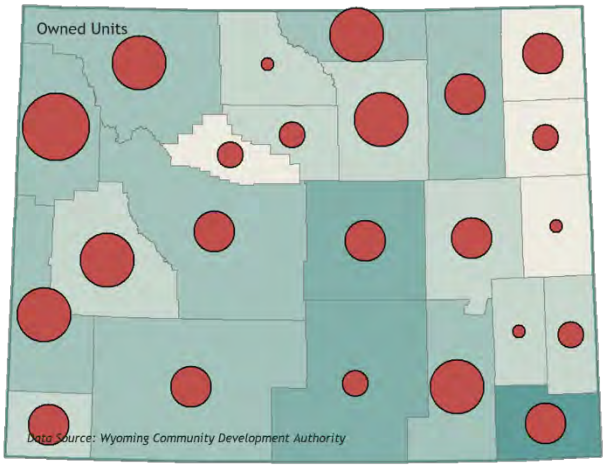
Area Vibes Livability Score
circles scaled by population

45 - 51 | 52 - 57 | 58 - 63 | 64 - 69 | 70 - 75 | 76 - 81

Areavibes uses metrics for amenities, cost of living, crime, education, employment, housing, and weather to estimate a livability score on a scale of 0-100. The US average is 66, which corresponds to the duller colors on this map

Housing





Median Monthly Rent ($)

832-1015 | 710-831 | 596-709 | 516-595 | 433-515

Rental Unit Shortage
Assumes housing payment = 30% of median family income

99-227
228-423
424-789
790-1825
1826-4510

Median Home Value (Thousands of $)

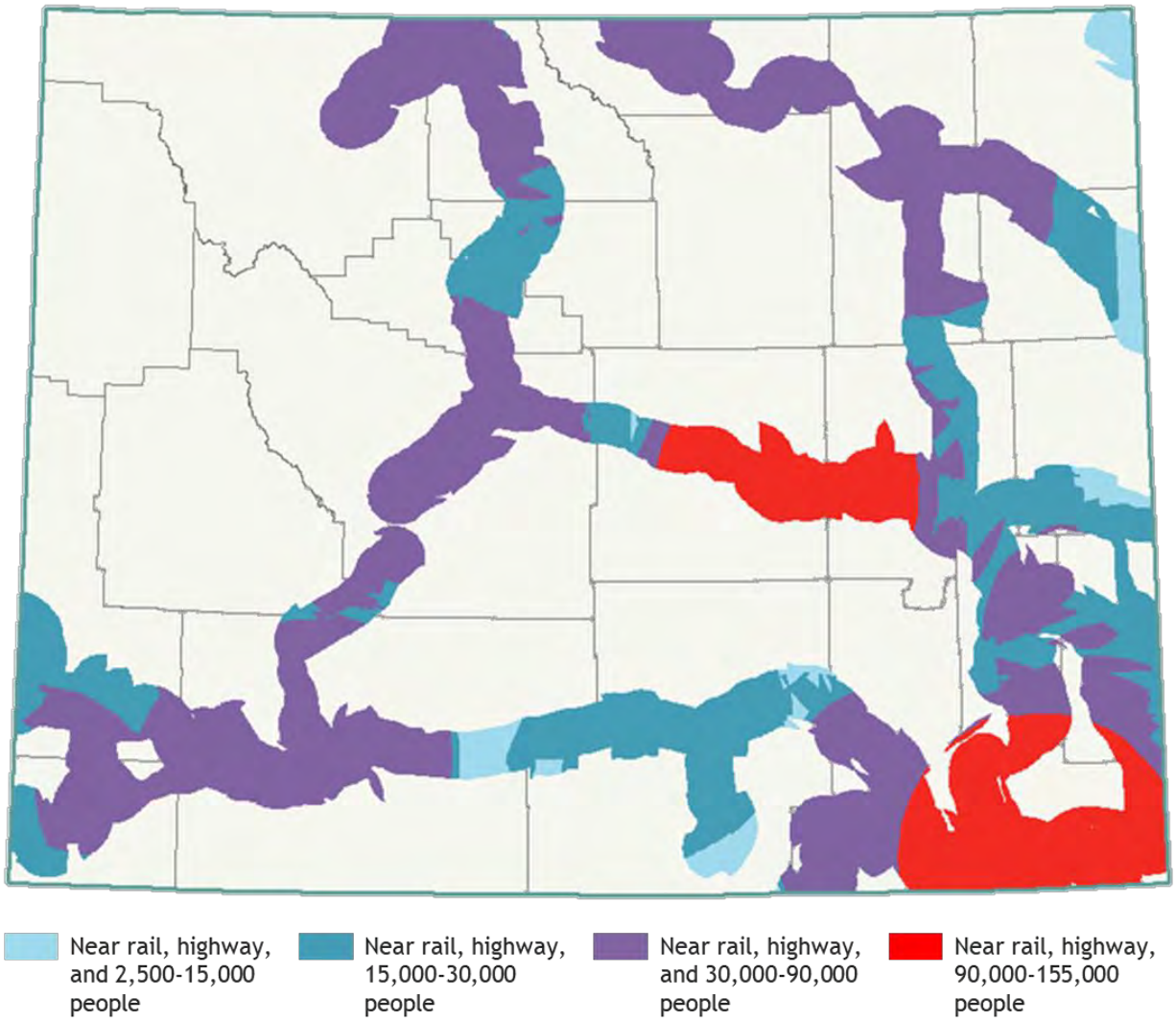
315-750 | 215-315 | 172-215 | 140-172 | 122-140

Owned Unit Shortage
Assumes housing payment = 30% of median family income

129 - 399
400 - 944
945 - 2370
2371 - 3801
3802 - 5108

Industry Asset Intersections

Intersections shown below, sites within these areas, areas characterized by one or more input assets (e.g. workforce), or intersections amongst sectors may be considered potential business development and innovation zones. More focused analyses will be presented in the report submitted to the Legislature and Governor before December 31st, 2017.



Asset Mapping Conclusions

Transportation and Warehousing intersections are driven by access to transportation.

For large transportation and warehousing, workforce is a significant limitation in many areas in Wyoming.

Air service and broadband, important enablers to this industry, are limited in most areas where other requirements are present.

Enablers, Incentives, Challenges

Transportation and Warehousing
Enablers
Interstate-80, Interstate-90, and Interstate-25
Wyoming highway quality and performance consistently leads nation
Less government red tape and more government transparency
Gas tax competitive with surrounding states
Previous success with Sierra Trading, Lowe's, and WalMart distribution centers
Wages on par with entry-level manufacturing jobs
Wyoming centrally located
Incentives
BRC - Infrastructure Grants
WYDOT - Minimum Revenue Guarantee (MRG) grants
Workforce Training Grants
Challenges
Ongoing infrastructure maintenance costs
Trucking and shipping costs higher in rural areas
Lack of rail served sites in some areas of Wyoming
Lack of long-term, comprehensive air service solution
Lack of proximity to markets
Generally favors Casper and Cheyenne
Natural resource jobs compete for these workers
CapEx can be a barrier to entry in this sector

Opportunities

Distribution centers

Transit companies

Information (51)

Summary of Sector

The Information sector comprises companies that produce and distribute information and cultural products, provide the means to distribute these products or other data or communications, and process data. They include publishing industries, motion picture and sound recording industries, broadcasting, telecommunications, and data processing, hosting, and related services. See Appendix 1 for a complete list of NAICS codes in this sector.

This sector contributes less to Wyoming's economy than it does to comparator states' and the US, representing 30.1% of Wyoming's GDP, and 1.5% of US GDP. Wyoming can grow the economy by $1.3 billion over the next 20 years, by increasing the 1.8% Wyoming GDP contribution to the 5.6% GDP contribution of the US.

Wages within this sector Wyoming wages in this sector are about half of the wages in the sector for the US.

One of the most significant barriers to this sector in Wyoming is the lack of fast, cost-competitive, redundant broadband to the end user.

Opportunities for growth in this sector include data centers and telecommunications. Data centers have been identified as an important opportunity and are a large focus in this report. Assets from industries within this sector are enablors for other sectors, and are also represented there. Expanding the footprint of this industry in Wyoming, especially broadband, will enable growth in other sectors.

The prevalence of technology and digitization is driving innovation in the publishing industry. The telecommunications industry is expected to grow, consolidate through mergers and acquisitions, and continue to innovate. While data center square footage is predicted to rise, the number of data centers is also expected to peak in 2017.

Trends

Publishing/Printing

- **Web to Print:** In today's digital business world, companies relying completely on physical documents and assets are at a disadvantage compared to their competitors who put their faith in technology a decade ago. Many companies cannot go 100 percent digital, and others simply don't want to, as printed content provides benefits that cloud-storage data cannot. With Web-to-print technology, employees are able to upload their content to cloud services and order those materials to be printed and shipped anywhere around the world. All types of businesses are taking advantage of Web-to-print, as it allows them to quickly and easily order, ship and receive additional copies of training manuals, corporate binders, posters, brochures and more.
- **On Demand Printing:** With Web-to-print services becoming the norm in commercial printing and almost 80 percent of businesses deciding to use less paper in the office – according to CompTIA – the meteoric rise in use of on-demand printing should come as no surprise. On-demand printing services allow organizations to order print resources in a piecemeal fashion. On one hand, this means that less paper is wasted. On the other hand, on-demand printing is a great solution for companies and associations that must frequently update and send content to satellite locations and remote offices or stores. Furthermore, on-demand printing services

enable firms to order exactly what they need and deliver it overnight without shipping materials themselves.

- **Digital Content Distribution:** As more organizations turn to Web-to-print and recognize the value in on-demand printing, the use of digital content distribution platforms is growing. In other words, the print industry isn't dead, it's evolving and taking advantage of technology. Now, businesses can upload content online and host it on digital content distribution platforms, allowing their partners, employees and customers to order branded print resources as they are needed. This allows all parties to access the same documents and contents, and those firms that host these resources can regularly update the materials, keeping up with client feedback and business process changes. Once organizations discover the power that digital content distribution platforms can offer, the printing industry will become more crowdsourced and reliant on its community, effectively keeping it alive for decades to come.

Sources:

https://www.mimeo.com/blog/print-industry-growth-and-innovation/

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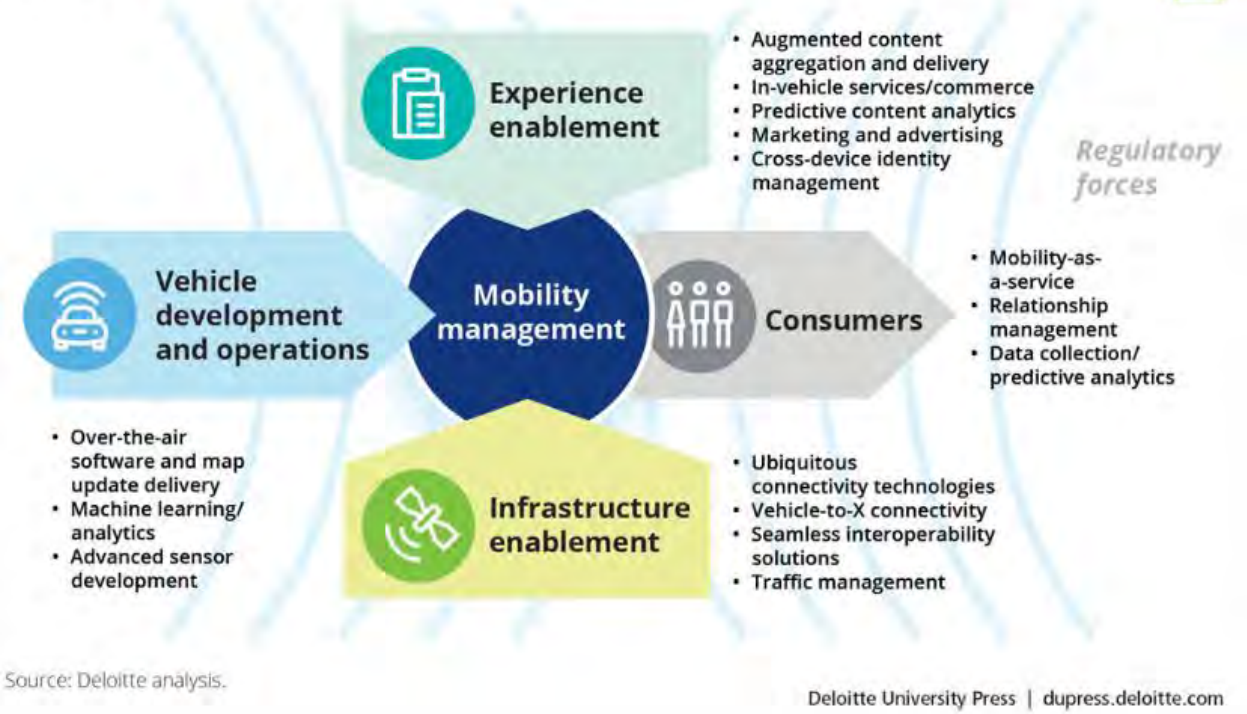
Telecommunications

- **Industry Growth:** US consumers are looking at their devices more than 9 billion times a day in the aggregate—up 13% from last year. Smartphone sales are still strong, with penetration up 10% year over year, and the highest growth percentages coming in the 45-54 and 55+ age demographics. While they are still relatively niche products, wearables such as smart watches and fitness bands have seen tremendous percentage growth. Smartwatch penetration doubled from 2014 to 2015 and tripled in 2016; smartwatches have now penetrated roughly 12% of the mobile consumer market in the US.
- **Mergers and Acquisitions:** There also remains significant opportunity for mergers and acquisitions, and on the heels of some substantive announcements in 2016, 2017 is likely to be another big year for deals. One thing that may help push some deals across the finish line is the prospect of less regulation from government agencies.
- **Business Strategy**: Focus is on providing data and voice services that are high quality, reliable, and affordable. The challenge in 2017 will continue to be the focus on capital allocation. Carriers must make upgrades to their core connectivity infrastructure, which in the case of the coming shift to fifth generation (5G) mobile networks may run billions of dollars. And, they will also require significant capital resources to fund such areas as the internet of things, autonomous vehicles, industry verticals, MandA, and international expansion. Carriers will need both a clearly articulated strategy and an efficient approach to capital spending to maximize their investments. As carriers seek to remain competitive, operations is one area that is ripe for improvement. Many telecoms still rely heavily on manual processes; the availability of new technologies and innovations may make 2017 the year of digital transformation for carriers in both in the US and globally. Areas with the greatest potential for digital improvement include customer care, sales, and billing.

- **Emerging Trends**
    - **5G**: 5G network promise to spark an enormous wave of change starting in 2017. While the technology has not yet been fully defined, carriers are proceeding with lab and field trials for basic connectivity elements in their to stay competitive. The promise of 5G—more speed, greater efficiency, and less latency—will be essential to supporting connected things in the future. There could well be a push to launch 5G to consumers in trial markets by the end of 2017. There will likely be full, mass market 5G coverage by approximately 2020.
    - **Autonomous Vehicles:** Once thought to be the stuff of science fiction, the autonomous vehicle has quickly emerged as a viable and highly desired product for consumers. In fact, according to this year's GMCS, there has been a nearly 50% increase in consumers who say they are likely to buy an autonomous vehicle—and a near doubling of those indicating they are "very likely" to do so. While 2017 won't see our roads suddenly filled with self-driving cars, it will be an important year for carriers to consider their future role in autonomous vehicles, since connectivity will be central to the many activities and services surrounding this emerging sector.
    - **Sensors:** In 2017, it's likely the active base of smartphones equipped with biometric fingerprint readers globally will top 1 billion. If each sensor is used an average of 30 times a day, that sums to over 10 trillion aggregate "presses" globally over the course of the year. There are numerous potential use cases for this technology in retail, financial institutions, the government, and even schools. With the ability to biometrically verify identities, smartphones are uniquely positioned to serve as all-in-one sources of critical information: who a person is, where they are, and what they intend to do. Other biometric authentication mechanisms (e.g., facial or retinal recognition) are also likely to pick up steam in the coming years and may become a staple of workforce authentication in addition to customer authentication.
    - **Machine Learning:** In 2017, it is likely over 300 million smartphones globally—or more than a fifth of units sold—will have onboard neural network machine learning capabilities. These capabilities are driven by computer models designed to mimic aspects of the human brain's structure and function. Why is this important? Because it can allow smartphones to perform highly sophisticated functions such as indoor navigation, augmented reality, speech recognition, and even learning an individual's daily tasks and preferences, enabling "digital assistants" like Siri and Alexa to be more proactive

Figure 2. Future mobility value opportunity areas for telecom



Source: Deloitte analysis.

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Sources:

https://www2.deloitte.com/us/en/pages/technology-media-and-telecommunications/articles/telecommunications-industry-outlook.html

https://dupress.deloitte.com/dup-us-en/focus/future-of-mobility/role-of-telecommunications-in-new-mobility-ecosystem.html?icid=dcom_promo_featured|us;en

Data Centers

- **Number of data centers set to peak:** According to the IDC, several factors are leading to a decline in data centers. The total number of data centers will peak at 8.6 million in 2017. From there, the number will decline as more and more companies will move data center operations from on-premise facilities to 'mega data centers' run by service providers. The cloud is also a game changer, with Cisco reporting that 75 percent of data center work would be run in the cloud by 2018.
- **Data center space will grow:** Data center space will grow, reaching 1.94 billion square feet in 2018 — up from 1.58 billion square feet in 2013. IDC predicts the continued growth in size of data center spaces, with the exception of on-premise server rooms and closets.
- **Demand for flexibility drives Infrastructure management outside:** With corporations in a race to innovate with new products, business models and marketing initiatives, they're demanding infrastructure that's flexible enough to keep up. As a result, IDC predicts most organizations will no longer manage their own infrastructures. Instead, they will use service provider data centers for dedicated and shared cloud offerings. "This will result in the consolidation and retirement of

some existing internal data centers, particularly at the low end," said Richard Villars, a vice president at IDC.

- **Job demands will evolve:** According to a report by Ovum, the demand for data scientists will wane as companies focus on a team approach involving data scientists and data engineers. The research firm noted that the flat demand for data scientists in recent years is an indicator that — outside of Global 2000 companies — other businesses would not likely be heavily recruiting these specialists in the next four years.
- **Asset Deployment:** According to a 2017 survey, 65% of new assets deployed were for enterprise owned data centers, 22% were for multi-tenant centers and 13% were deployed for cloud computing. This indicates the strongest recent growth has occurred at the enterprise level.

Sources:

https://lifelinedatacenters.com/data-center/emerging-data-center-trends/

http://www.evolvingsol.com/2017/05/31/enterprise-data-center-trends/

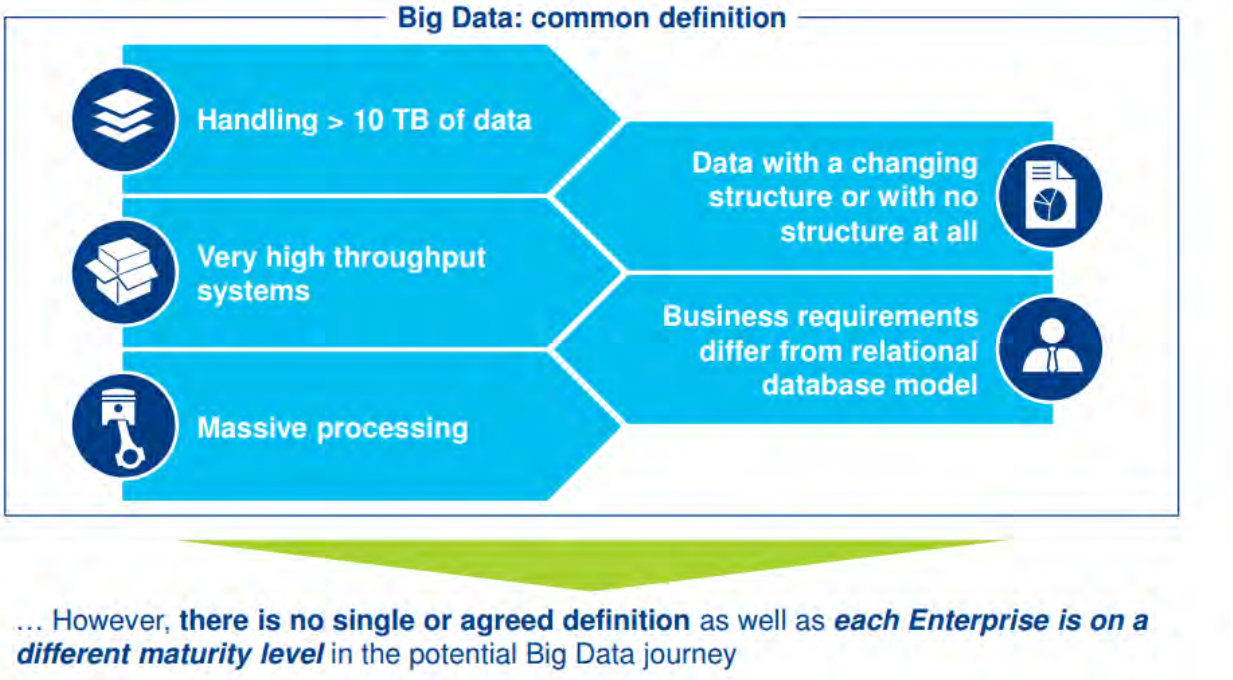
Big Data (Data Processing/Hosting/Analytics/Etc)

- **Streaming:** While machine learning continues to grab the headlines, real-time streaming will become the fastest-growing use case. A perfect storm has transformed real-time streaming from a niche technology to one with broad, cross-industry appeal. Open source technology has lowered barriers to entry for both technology providers and customers; scalable commodity infrastructure has made the processing of large torrents of real-time data in motion economically and technically feasible. The explosion in bandwidth and smart-sensor technology has opened up use cases ranging from location-based marketing to health and safety, intrusion detection, and predictive maintenance, appealing to a broad cross section of industries.
- **Big Data:** Big data has emerged from its infancy to transition from buzzword to urgency for enterprises across all major sectors. Growing pains are being abetted by machine learning, which will lower barriers to adoption of big data-enabled analytics and solutions, and the growing dominance of the cloud, which will ease deployment hurdles.
- **Mergers and Acquisitions:** AI and analytics vendor M&A activity will accelerate. There's no doubt that there's a massive land grab for anything AI, machine learning or deep learning. With a limited number of startups offering these integrated capabilities, the quest for relevant insights and ultimately recommended actions that can help with predictive and more efficient forecasting and decision-making will lead to even more aggressive M&A activity in 2017.
- **Data Lakes:** Many companies who took the data lake plunge in the early days have spent a significant amount of money not only buying into the promise of low cost storage and process, but a plethora of services in order to aggregate and make available significant pools of big data to be correlated and uncovered for better insights. With existing big data projects recognizing the need for a reliable data foundation, and new projects being combined into a holistic data management strategy, data lakes may finally fulfill their promise in 2017.
- **Monetization:** For enterprises to tap into the data they use to run their businesses as a potential new revenue stream, the data must be reliable, relevant, segmented, secure, anonymized, if necessary, and audited to guarantee ownership of data. Last year, Gartner highlighted that only 10% of CEOs said they monetize information assets by bartering with them or selling them outright. That number, fueled by modern data management technology, is sure to grow in 2017.
- **Security:** In 2017, vendors offering Platform as a Service and tools themselves must also do their part in complying to Service Organization Control types, as well as in the case of healthcare data, Health Information Trust Alliance, that provides an established security framework that can be used by all organizations that create, access, store or exchange sensitive and regulated data.
- **Operational Intelligence:** The need for "operational" intelligence to capture highly dynamic business opportunities will shift the focus of big data from the data warehouse to live systems: In 2017, we expect to see widespread integration of this exciting capability into live systems.
- **In Memory Computing**: In-memory computing will enter the mainstream as the enabling technology for adding operational intelligence to live systems, and it will supplant legacy streaming technologies. The adoption of in-memory computing technologies, such as in-memory data grids (IMDGs), will provide the enabling technology to capture perishable opportunities and make mission-critical decisions on live data. Driven by the need for real-time analytics, the IMDG market alone – currently estimated at $600 million – will exceed $1 billion by 2018, according to Gartner.

Sources:

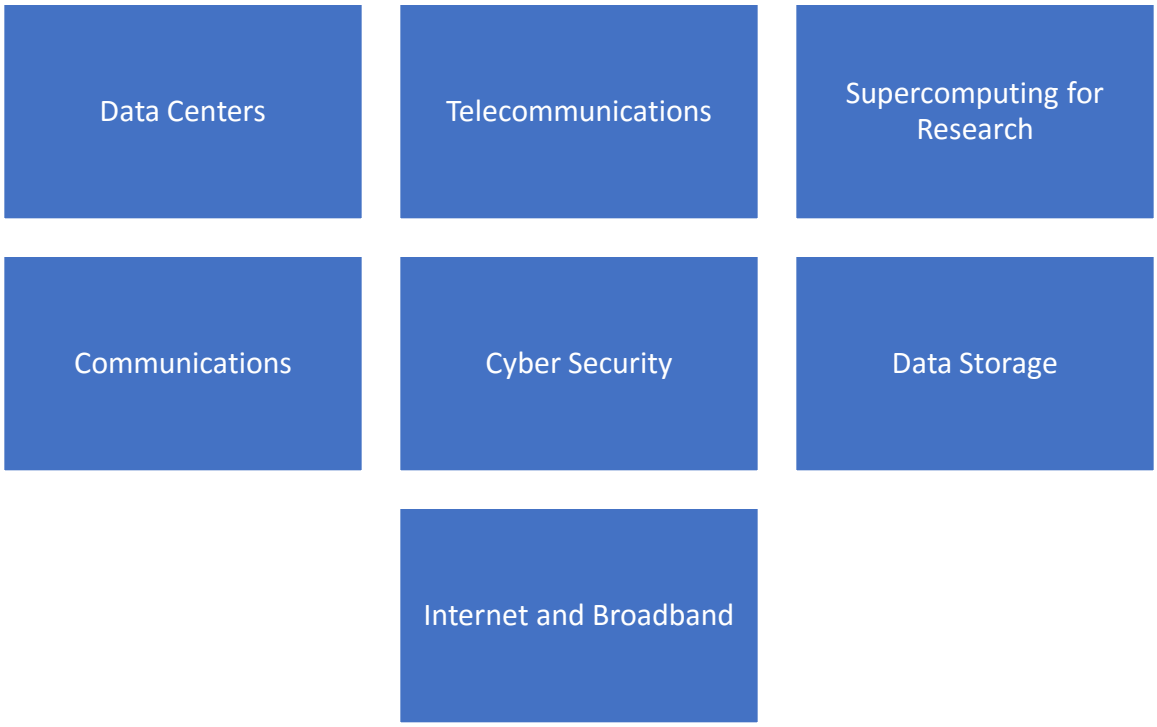
http://www.kdnuggets.com/2016/12/industry-predictions-key-trends-2017.html/2

https://www2.deloitte.com/content/dam/Deloitte/it/Documents/deloitte-analytics/bigdata_challenges_success_factors.pdf



Industry Focus Around the State

Communities around the state have identified the following specific focus industries within the Information sector. This data was collected using the ENDOW Regional Assessment.

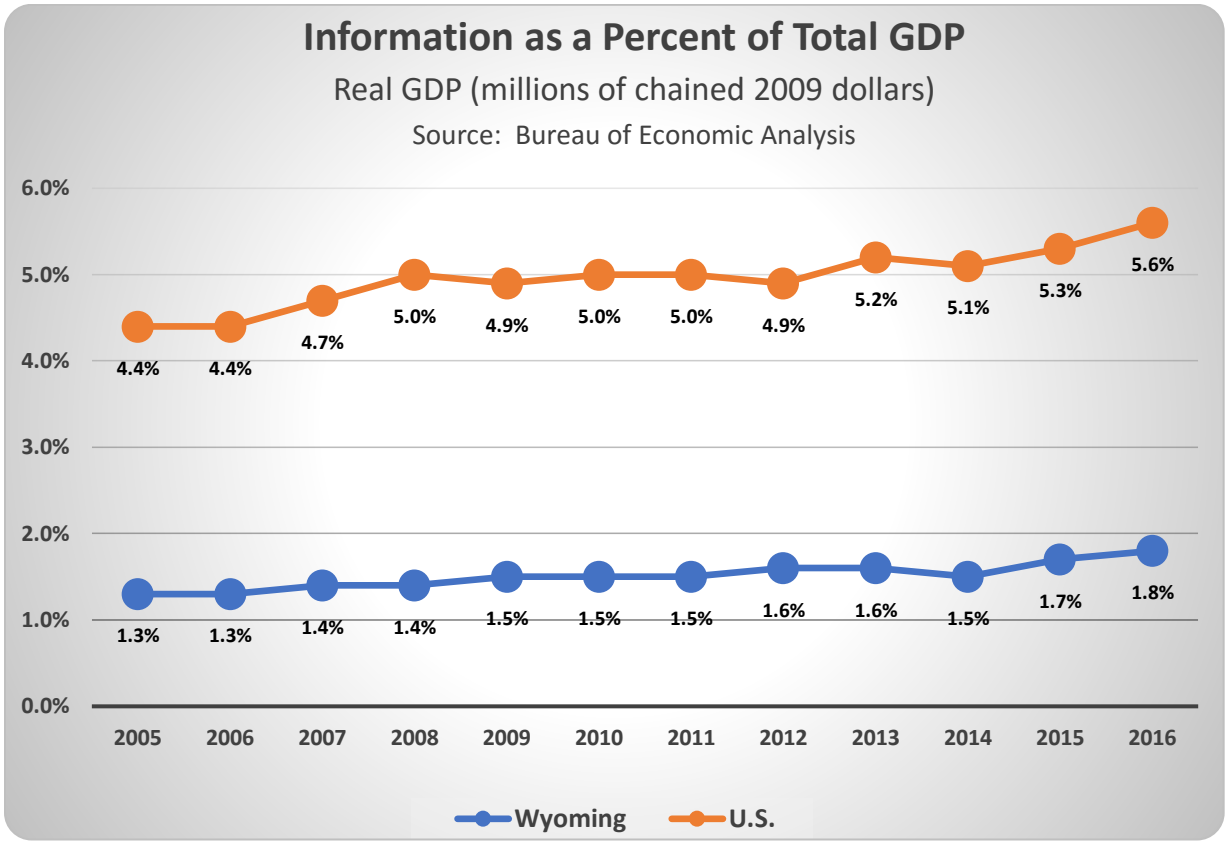


How does Wyoming compare?

WY Information as a % of Total GDP Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Information	% of Total GDP
2005	$29,637	$396	1.3%
2010	$36,469	$545	1.5%
2016	$34,439	$614	1.8%

U.S. Information as a % of Total GDP Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Information	% of Total GDP
2005	$14,203,241	$620,448	4.4%
2010	$14,628,165	$735,108	5.0%
2016	$16,342,925	$909,216	5.6%

Source: Bureau of Economic Analysis



Wyoming can grow its GDP by $1.3 billion by increasing the Information sector's current 1.8% GDP contribution to the 5.6% contribution of the US.

Wyoming and United States Information Sector GDP

Real GDP (millions of chained 2009 dollars)

Industry	2005 WY GDP	2005 WY % of Total GDP	2005 U.S. GDP	2005 U.S. % of Total GDP	2010 WY GDP	2010 WY % of Total GDP	2010 U.S. GDP	2010 U.S. % of Total GDP
Publishing Industries, except Internet (includes Software)	$ 92	23.2%	$ 181,495	29.3%	$ 102	18.7%	$ 184,550	25.1%
Motion Picture and Sound Recording Industries	$ 14	3.5%	$ 63,104	10.2%	$ 32	5.9%	$ 107,437	14.6%
Broadcasting and Telecommunications	$ 254	64.1%	$ 306,888	49.5%	$ 372	68.3%	$ 372,705	50.7%

Industry	2015 WY GDP	2015 WY % of Total GDP	2015 US GDP	2015 US % of Total GDP
Publishing Industries, except Internet (includes Software)	$ 90	22.7%	$ 202,996	32.7%
Motion Picture and Sound Recording Industries	$ 52	13.1%	$ 111,257	17.9%
Broadcasting and Telecommunications	$ 416	105.1%	$ 428,396	69.0%

Source: Bureau of Economic Analysis

States with the Highest and Lowest Shares of Information 2016

(as a Percentage of Their Gross State Product)

Top Five States		Bottom Five States	
Washington	11.4%	Idaho	2.3%
California	9.5%	Maine	2.2%
New York	9.1%	Indiana	2.1%
Georgia	8.4%	Wyoming	1.8%
Pennsylvania	7.5%	Delaware	1.8%

In 2016, Wyoming ranked 49th in the nation at 1.8%

Information plays an important role in our national economy, accounting for roughly 5.6 percent of the United States GDP. Wyoming would rank 9th in the nation for information if we grow our GDP to 5.6 percent.

Percentage Information Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Information GDP	% of Total GDP
Wyoming	$614	1.8%
Alaska	$1,471	3.1%
Colorado	$19,976	6.8%
Idaho	$1,395	2.3%
Montana	$1,049	2.6%
New Mexico	$3,437	4.0%
North Dakota	$1,266	2.7%
South Dakota	$1,279	3.1%
Utah	$6,894	5.1%
United States	$909,216	5.6%

Source: Bureau of Economic Analysis

Percentage Information Contributes to Total Employment

2016

	Information Employment	% of Total Employment
Wyoming	3,741	1.4%
Alaska	6,282	1.9%
Colorado	71,732	2.8%
Idaho	8,992	1.3%
Montana	6,324	1.4%
New Mexico	13,012	1.6%
North Dakota	6,631	1.6%
South Dakota	5,765	1.4%
Utah	35,616	2.6%
United States	2,794,388	2.0%

Source: Bureau of Labor Statistics

Wyoming and United States Information Sector Establishments

	2005				2010			
Industry	**WY**		**U.S.**		**WY**		**U.S.**	
Information	**#**	**% of Total Mining**	**#**	**% of Total Mining**	**#**	**% of Total Mining**	**#**	**% of Total Mining**
Publishing Industries, except Internet	90	23.7%	35,254	24.8%	82	22.8%	34,571	24.0%
Motion Picture and Sound Recording Industries	51	13.5%	25,904	18.3%	56	15.6%	26,332	18.3%
Broadcasting, except Internet	53	14.0%	9,805	6.9%	47	13.1%	9,861	6.9%
Internet Publishing and Broadcasting	5	1.3%	3,304	2.3%				
Telecommunications	136	35.9%	42,574	30.0%	127	35.3%	45,615	31.7%
Data Processing, Hosting and Related Services	40	10.6%	21,123	14.9%	25	6.9%	14,398	10.0%
Other Information Services	4	1.1%	3,907	2.8%	23	6.4%	13,064	9.1%
	379		141,871		360		143,841	

	2016				
Industry	**WY**			**U.S.**	
Information	**#**	**% of Total Mining**		**#**	**% of Total Mining**
Publishing Industries, except Internet	78	20.4%		41,630	26.5%
Motion Picture and Sound Recording Industries	59	15.4%		29,017	18.5%
Broadcasting, except Internet	44	11.5%		9,687	6.2%
Internet Publishing and Broadcasting					
Telecommunications	141	36.8%		35,520	22.6%
Data Processing, Hosting and Related Services	36	9.4%		19,515	12.4%
Other Information Services	24	6.3%		21,512	13.7%
	383			156,880	

Businesses in the Sector

Firms in Wyoming	
Total Firms	427
Average Age	12
Number Firms Under 5 Years Old	185
Number Firms 5-9 Years Old	72
Number Firms over 10 Years Old	170

Wyoming and United States Firms, Employees and Annual Wage (2016)

		Wyoming			United States		
NAICS Code	Industry	Firms	Employees	Annual Wages	Firms	Employees	Annual Wages
51	Information	383	3,741	45,482	156,880	2,794,388	98,474
511	Publishing industries, except Internet	78	916	29,922	41,630	724,344	106,863
512	Motion picture and sound recording industries	59	476	19,737	29,017	436,935	65,276
515	Broadcasting, except Internet	44	422	34,130	9,687	272,939	84,758
517	Telecommunications	141	1,682	61,241	35,520	798,589	85,955
518	Data processing, hosting and related services	36	197	54,267	19,515	300,667	105,995
519	Other information services	24	49	101,778	21,512	260,914	174,779

Number of firms in the Wyoming, the average age of those firms and the number of firms less than 5 years old and less than 10 years old.

	NAICS	Total Units	AVG AGE	Less_than_5	5-9	10 Plus
Information	51	427	12	185	72	170

#2 The table "Industry by 3-digit NAICS" for each industry (Number of Firms and Average Monthly Jobs Worked Manufacturing by Sub-sector (3-Digit NAICS Code) in Wyoming and the US, 2016).

NAICSCode	Industry	wy firms	wy emp	wy annual wage	us firms	us emp	us annual wage
51	Information	383	3,741	45,482	156,880	2,794,388	98,474
511	Publishing industries, except Internet	78	916	29,922	41,630	724,344	106,863
512	Motion picture and sound recording industries	59	476	19,737	29,017	436,935	65,276
515	Broadcasting, except Internet	44	422	34,130	9,687	272,939	84,758
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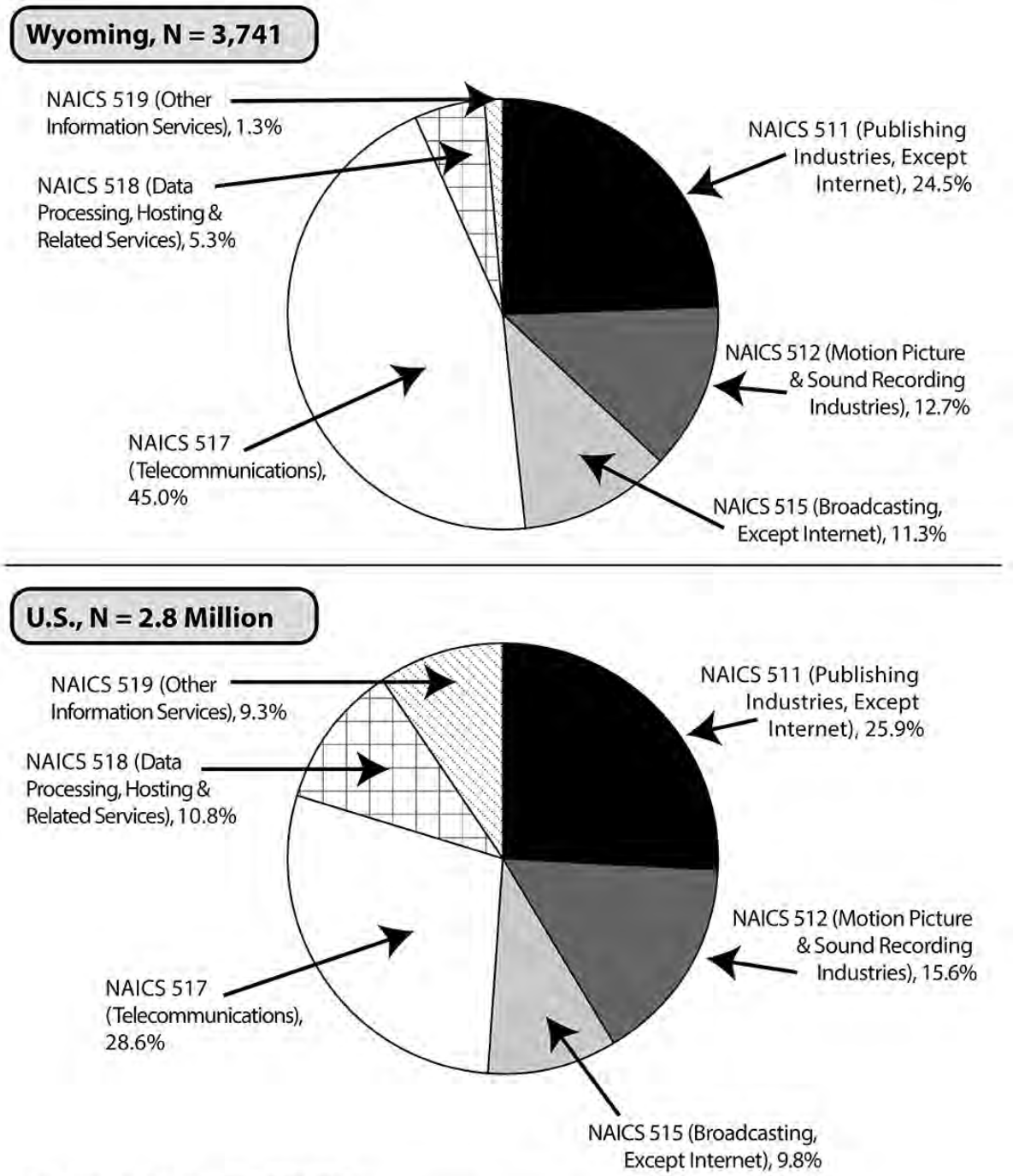
519	Other information services	24	49	101,778	21,512	260,914	174,779

NAICS[a] 51: Information

Distribution of Jobs by 3-Digit NAICS Code in Wyoming and the U.S., 2016 Annual Average



[a]North American Industry Classification System.
[b]NAICS 113 and 114 for Wyoming are not discloseable due to confidentiality.
Source: Quarterly Census of Employment and Wages. U.S. Bureau of Labor Statistics.
Prepared by T. Glover and M. Moore, Research & Planning, WY DWS, 7/21/17.

Workforce

Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	349	6,903	$48,526
Colorado	2005	3,516	77,437	$68,642
Idaho	2005	810	11,064	$35,964
Montana	2005	752	7,785	$35,464
New Mexico	2005	882	14,651	$36,523
North Dakota	2005	414	7,651	$41,235
South Dakota	2005	473	6,755	$35,392
Utah	2005	1,745	30,888	$45,899
Wyoming	2005	379	4,296	$30,235
US	2005	141,871	3,056,431	$62,852

State	Year	Firms	Employees	Annual Wage
Alaska	2010	380	6,444	$55,011
Colorado	2010	3,159	71,694	$82,084
Idaho	2010	941	9,673	$41,119
Montana	2010	703	7,390	$41,694
New Mexico	2010	934	14,289	$41,743
North Dakota	2010	394	7,300	$49,097
South Dakota	2010	514	6,542	$39,983
Utah	2010	1,680	28,042	$52,435
Wyoming	2010	360	3,881	$38,798
US	2010	143,841	2,703,886	$74,395

State	Year	Firms	Employees	Annual Wage
Alaska	2016	388	6,282	$62,872
Colorado	2016	3,580	71,732	$95,554
Idaho	2016	1,076	8,992	$49,031
Montana	2016	707	6,324	$50,210
New Mexico	2016	953	13,012	$51,084
North Dakota	2016	389	6,631	$63,246
South Dakota	2016	564	5,765	$46,739
Utah	2016	2,223	35,616	$70,076
Wyoming	2016	383	3,741	$45,494
US	2016	156,880	2,794,388	$98,474

Occupations in Information

Title	Mean Hourly	Mean Annual	Median Hourly	Median Annual
Total all occupations	$21	$43,626	$17	$36,289
Management Occupations	$43	$89,810	$37	$77,698
Top Executives	$42	$86,720	$34	$70,258
General and Operations Managers	$42	$86,720	$34	$70,258
Operations Specialties Managers	$49	$101,969	$43	$89,633
Computer and Information Systems Managers	$47	$97,547	$43	$90,073
Other Management Occupations	$43	$90,359	$43	$90,114
Managers, All Other	$37	$76,785	$35	$72,864
Business and Financial Operations Occupations	$29	$59,953	$28	$58,322
Business Operations Specialists	$28	$57,648	$27	$57,120
Purchasing Agents, Except Wholesale, Retail, and Farm Products	$21	$44,557	$22	$44,988
Human Resources Specialists	$28	$57,597	$26	$54,357
Market Research Analysts and Marketing Specialists	$30	$61,914	$29	$60,425
Financial Specialists	$32	$66,424	$30	$61,524
Accountants and Auditors	$32	$66,583	$30	$61,403
Computer and Mathematical Occupations	$32	$67,194	$29	$60,685
Computer Specialists	$32	$67,194	$29	$60,685
Computer Systems Analysts	$36	$75,502	$37	$76,309
Software Developers, Systems Software	$37	$77,801	$37	$76,957
Web Developers	$29	$60,644	$28	$58,334
Network and Computer Systems Administrators	$35	$72,504	$33	$69,608
Computer Network Architects	$63	$130,877	$52	$109,162
Computer User Support Specialists	$21	$44,348	$18	$38,432
Computer Network Support Specialists	$28	$58,001	$28	$57,503
Architecture and Engineering Occupations	$37	$76,138	$35	$73,745
Engineers	$39	$81,244	$37	$77,297
Electronics Engineers, Except Computer	$39	$80,222	$37	$76,731
Drafters, Engineering, and Mapping Technicians	$23	$47,972	$23	$47,103
Arts, Design, Entertainment, Sports, and Media Occupations	$18	$36,523	$16	$32,533
Art and Design Workers	$17	$35,609	$15	$31,675
Graphic Designers	$17	$35,609	$15	$31,675
Entertainers and Performers, Sports and Related Workers	$22	$46,290	$18	$36,748
Producers and Directors	$22	$46,290	$18	$36,748
Media and Communication Workers	$15	$31,675	$14	$29,217
Radio and Television Announcers	$14	$29,960	$14	$28,387
Reporters and Correspondents	$13	$27,582	$13	$27,655

Editors	$19	$39,999	$19	$39,000
Media and Communication Equipment Workers	$20	$40,988	$18	$37,568
Audio and Video Equipment Technicians	$23	$46,904	$24	$48,996
Broadcast Technicians	$19	$39,776	$18	$36,535
Photographers	$15	$31,820	$16	$32,546
Food Preparation and Serving-Related Occupations	$10	$19,861	$9	$18,948
Food and Beverage Serving Workers	$9	$18,972	$9	$18,792
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	$9	$18,972	$9	$18,792
Building and Grounds Cleaning and Maintenance Occupations	$11	$23,904	$11	$22,184
Building Cleaning and Pest Control Workers	$12	$24,112	$11	$22,434
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$12	$24,112	$11	$22,434
Personal Care and Service Occupations	$9	$18,309	$9	$18,049
Supervisors, Personal Care and Service Workers	$12	$25,311	$12	$25,560
First-Line Supervisors of Personal Service Workers	$12	$25,311	$12	$25,560
Entertainment Attendants and Related Workers	$8	$17,502	$9	$17,906
Motion Picture Projectionists	$9	$18,348	$9	$18,280
Ushers, Lobby Attendants, and Ticket Takers	$8	$17,365	$9	$17,857
Sales and Related Occupations	$17	$36,056	$14	$29,769
Supervisors, Sales Workers	$22	$44,793	$19	$40,391
First-Line Supervisors of Retail Sales Workers	$18	$38,081	$15	$30,603
First-Line Supervisors of Non-Retail Sales Workers	$28	$57,750	$24	$49,249
Retail Sales Workers	$13	$26,322	$10	$21,661
Cashiers	$9	$18,712	$9	$18,810
Retail Salespersons	$18	$37,774	$17	$35,046
Sales Representatives, Services	$19	$38,657	$15	$31,142
Advertising Sales Agents	$18	$37,256	$14	$29,590
Sales Representatives, Services, All Other	$22	$46,100	$20	$41,443
Sales Representatives, Wholesale and Manufacturing	$24	$49,000	$23	$47,142
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	$24	$49,992	$23	$47,305
Office and Administrative Support Occupations	$15	$31,892	$14	$29,300
Supervisors, Office and Administrative Support Workers	$26	$53,590	$23	$47,984
First-Line Supervisors of Office and Administrative Support Worke	$26	$53,590	$23	$47,984
Financial Clerks	$18	$36,458	$17	$35,727
Bookkeeping, Accounting, and Auditing Clerks	$16	$33,466	$16	$33,576
Information and Record Clerks	$15	$30,938	$14	$28,397
Customer Service Representatives	$15	$30,982	$14	$28,382

Receptionists and Information Clerks	$14	$28,683	$14	$28,075
Material Recording, Scheduling, Dispatching, and Distributing Workers	$19	$39,497	$18	$36,892
Secretaries and Administrative Assistants	$19	$40,479	$19	$39,798
Secretaries and Administrative Assistants, Except Legal, Medical,	$18	$37,321	$17	$35,281
Other Office and Administrative Support Workers	$13	$27,079	$12	$25,167
Mail Clerks and Mail Machine Operators, Except Postal Service	$9	$17,731	$9	$17,934
Office Clerks, General	$17	$35,070	$15	$31,863
Construction and Extraction Occupations	$27	$55,865	$27	$56,564
Construction Trades Workers	$27	$55,542	$27	$55,928
Electricians	$30	$62,130	$29	$60,794
Installation, Maintenance, and Repair Occupations	$27	$55,474	$26	$54,676
Supervisors of Installation, Maintenance, and Repair Workers	$38	$78,393	$37	$77,800
First-Line Supervisors of Mechanics, Installers, and Repairers	$38	$78,393	$37	$77,800
Electrical and Electronic Equipment Mechanics, Installers, and Repairers	$26	$54,072	$26	$53,549
Radio, Cellular, and Tower Equipment Installers and Repairers	$29	$60,376	$29	$60,585
Telecommunications Equipment Installers and Repairers, Except Line Installers	$26	$54,639	$26	$54,617
Other Installation, Maintenance, and Repair Occupations	$23	$48,640	$23	$47,811
Telecommunications Line Installers and Repairers	$24	$50,250	$23	$48,471
Maintenance and Repair Workers, General	$19	$40,309	$19	$39,335
Production Occupations	$14	$30,109	$14	$28,601
Printing Workers	$15	$30,799	$14	$29,886
Printing Press Operators	$15	$32,014	$16	$32,624
Transportation and Material Moving Occupations	$12	$24,527	$11	$21,872
Motor Vehicle Operators	$12	$24,288	$11	$22,571
Light Truck or Delivery Services Drivers	$11	$23,069	$10	$21,193
Material Moving Workers	$10	$20,553	$10	$20,250
Packers and Packagers, Hand	$9	$19,506	$9	$19,721

Exports

No international exports from Wyoming, according to US Import and Export Trade Statistics

Asset Maps

A baseline for delineating Business Development and Innovation Zones

Data centers have been identified as an important opportunity within the Information sector. While maps here are focused on this opportunity, many assets of industries within the Information sector (e.g. broadband) are required for success of other sectors, and are represented in those sections.

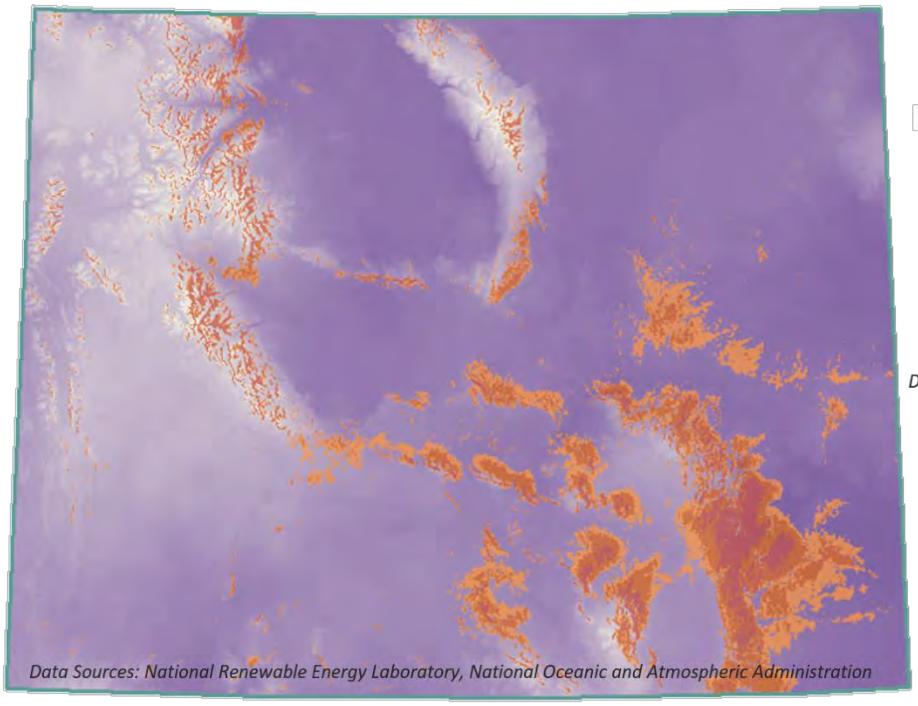
Mappable Sector Assets

Data Centers

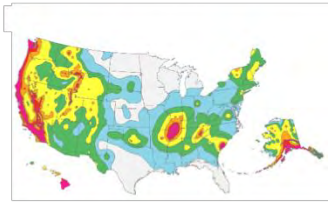
Infrastructure
•Fiber •Power Supply •Cool Climate •Low hazard risk •Potential customers – existing businesses •Renewable energy sources

Workforce is a common required asset for many industries. It is omitted here because data centers are not workforce-intensive relative to other industries.

Climate and Hazards



National Earthquake Risk



Low Risk — High Risk

Data Source: US Geological Survey

National Tornado Map

· US Tornados 1950-2016

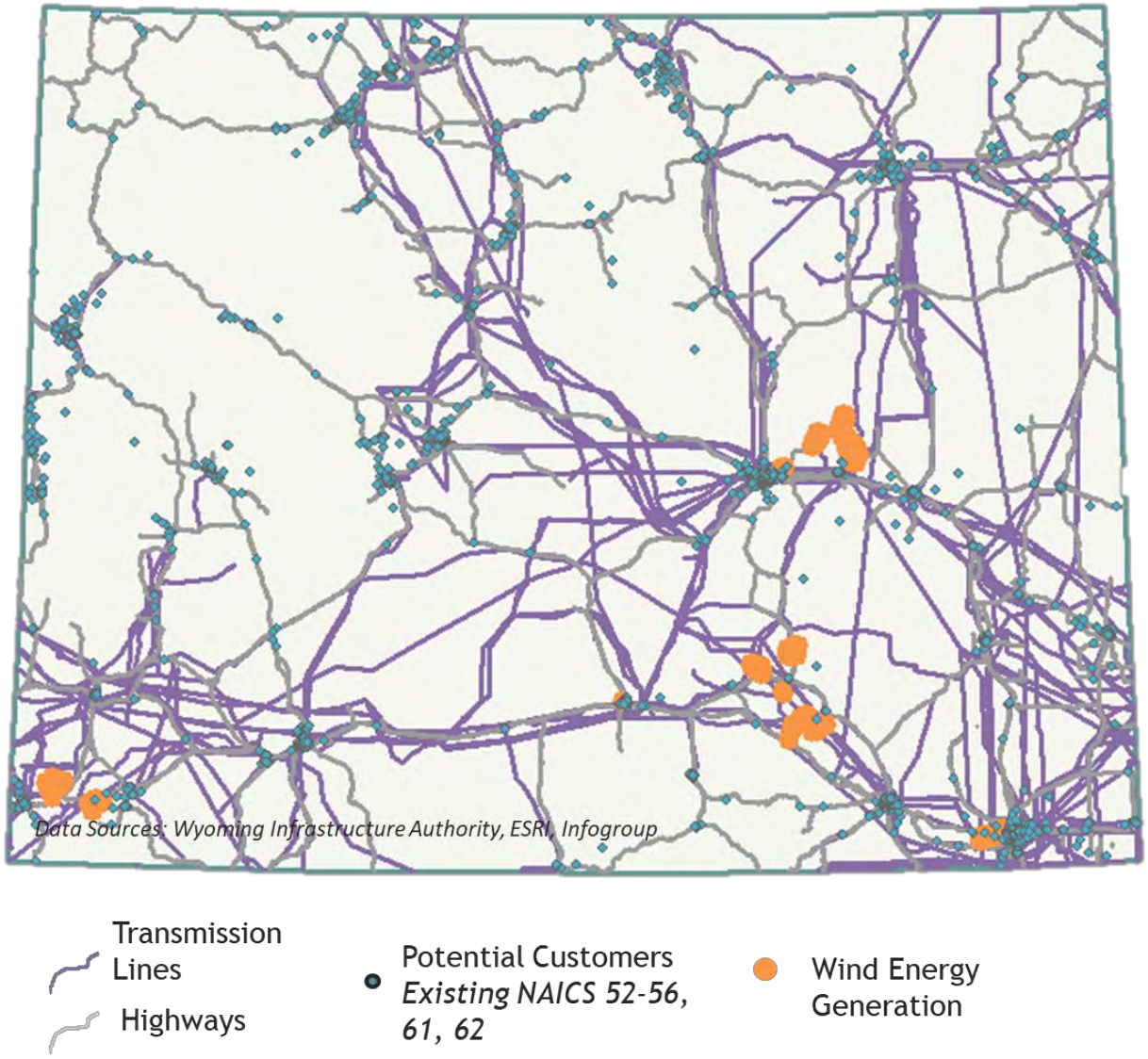
Data Source: NOAA

Wind Power Class:

5
6
7

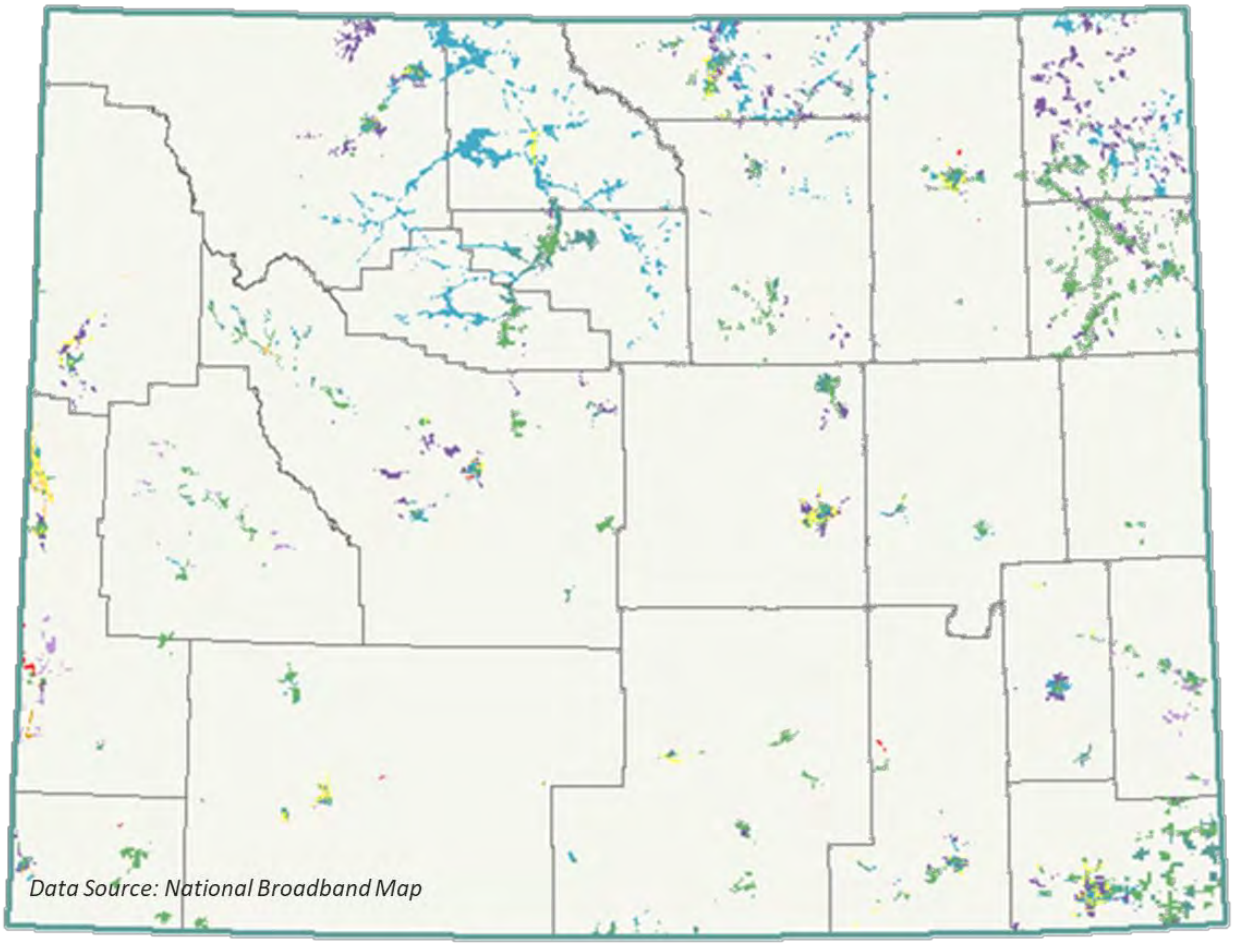
Annual Average Temperature:

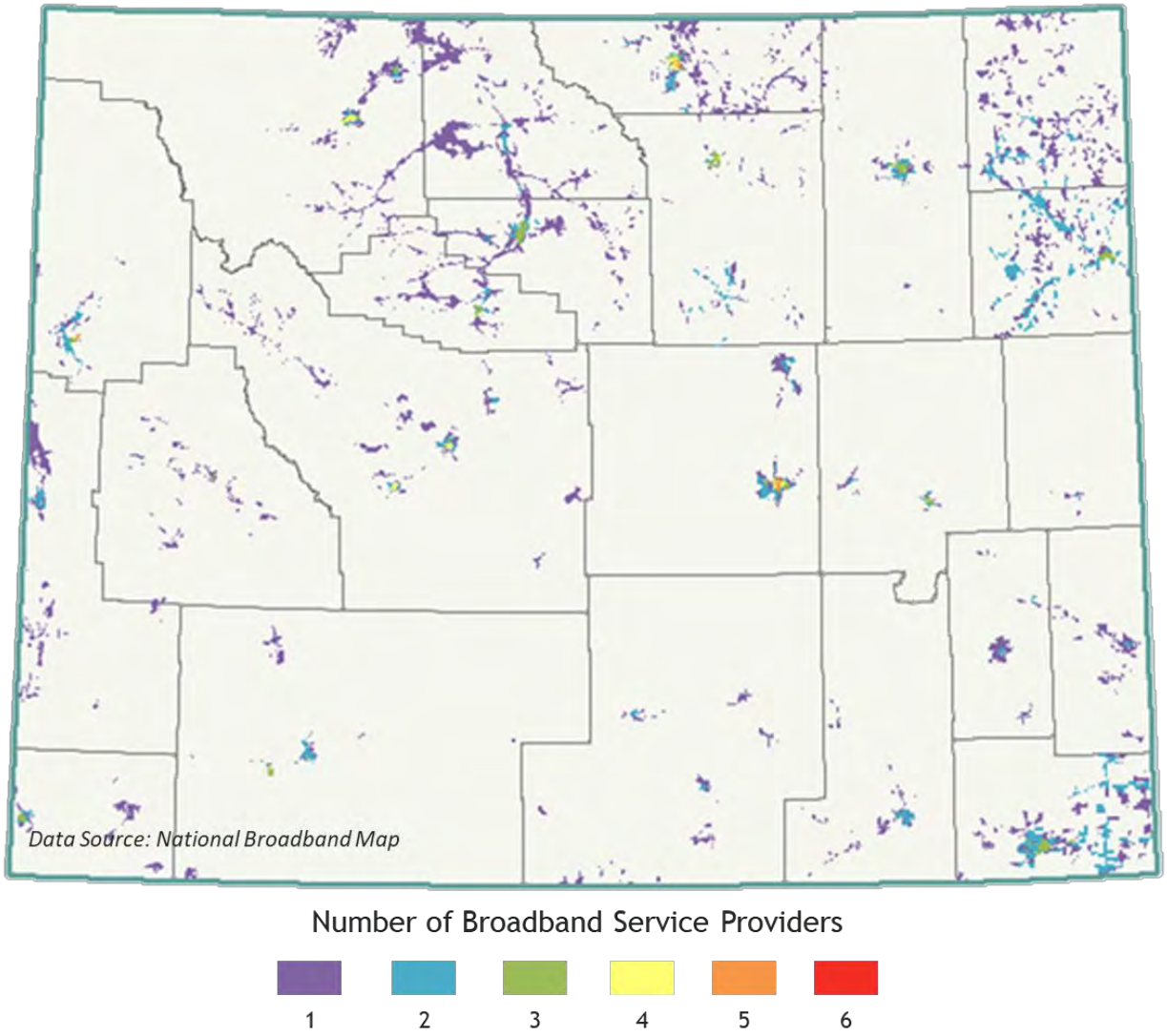
Infrastructure



Areas suitable for data centers are limited by access to broadband internet. Therefore, the following maps represent industry asset intersections for data centers. Areas shown below, sites within these areas, areas characterized by one or more input assets (e.g. workforce), or intersections amongst sectors may be considered potential business development and innovation zones. More focused analyses will be presented in the report submitted to the Legislature and Governor before December 31st, 2017.

Internet Connectivity





Asset Mapping Conclusions

Wyoming's cool climate, high wind class, and low hazard risk are advantageous to development of data centers in the state.

Locations are limited by access to broadband, which exists predominantly in the more highly populated areas of the state.

Information

Enablers
No income taxes
Wyoming's outdoor lifestyle and livability
Reputation for Data Centers (Microsoft, EchoStar, Ptelomy, Green House
Low electricity costs
Cool climate reduces cooling costs
Information is a targeted industry for WBC
WTBC
Breakthrough 307
Wyoming Technology Business Center
Incentives
BRC - Managed Cost Data Center Grants
Trade Show Incentive Grants
Challenge Loan
SBIC
Workforce Training Grants
Challenges
Lack of amenities to attract mellenial talent
Lack of skilled workforce
Availabiltiy of workforce
Cost of housing in some areas of state (Jackson, Laramie, etc.)
Broadband may be a challenge in some parts of Wyoming
Lack of long-term, comprehensive air service solution
Proximity to markets
Transmission Capacity

Obstacles

Industry Input:

I am in agreement there are areas of the State that are underserved by broadband and there is no easy solution to the issue. Building out broadband networks is extremely expensive with little return.

-Aaron Sopko, Advanced Communications Technology

Opportunities

Data Centers

Telecommunications

Increasing access to broadband to help grow other sectors

Industry Input:

There are numerous sectors that may offer employment opportunities with fewer obstacles. Companies such as Salesforce, Twitter, and others have started looking to boutique coding, support and other specific expertise companies for assistance where needed.

Solutions can be had, with solid public/private relationships and an open mind on both ends. Significant broadband availability will have a positive impact in Wyoming regardless of industry.

-Aaron Sopko, Advanced Communications Technology

Finance, Insurance, Real Estate – 52-53

Summary of Sector

What businesses are in the sector?

Leasing; monetary authorities – central bank; credit intermediation; securities, commodity contracts, investments; insurance carriers and related activities; funds, trusts and other financial vehicles; real estate; rental and leasing services and lessors of nonfinancial intangible assets

Compare to US and other states

Wyoming general ranks behind the US and other surrounding states in this industry. Financial activities contributed 13.9% to Wyoming's GDP in 2016 compared to 19.8% for the US. If Wyoming can close that gap the 6% difference would add $2 billion to the State's GDP

Workforce

Wages within this sector general pay above the mean and median for all occupations. In Wyoming, however, wages are on the lower end as compared to surrounding states.

Barriers and obstacles

Regulatory environment, lack of reliable job base in sufficient numbers

Opportunities

Industry consolidation, family trusts

Emerging trends

- Deregulation will allow financial institutions to invest more in customers and less on risk mitigation
- Asset management
- Technology will change the fundamentals of the traditional jobs in this industry
- Most ventures will require larger partners

Trends

Industry Input

We are on the edge of a major shift in how people work and the relationship between people and technology in the workplace. Technology will increasingly make jobs unneeded or fundamentally changed. Routine tasks will become the work of computers and people will need to learn new ways to work with technology. There will be pressure to reduce the number of people as the current workload shifts toward automation. Cloud based services, blockchain technology, data analytics, cybersecurity and artificial intelligence are here or will be in the near future.

Talent shortages in the accounting profession include everything from lower skilled bookkeepers to highly trained certified public accountants. The profession continues to move toward increased specialization, yet there is a struggle to get young people to sit for and pass the CPA Exam.

Lack of succession planning. It is estimated that more than 60 percent of equity partners in US public accounting firms are over the age of 50, and 75 percent of the membership of the American Institute of CPAs will be eligible to retire by the year 2020. The statistics for Wyoming CPAs are similar. Consolidation of firms and increased outsourcing of services may be in Wyoming's future.

Source: Wyoming Society of CPA's

Insurance

Other than the health insurance market, the insurance market in Wyoming is consistent and stable. Wyoming consumers are well served, there are a sufficient number of insurers, and there are a significant number of agent of agents and brokers in all areas of insurance except health insurance. Wyoming has just one insurer on the Federal Health Insurance Marketplace. The current uncertainty about the future of the Affordable Care Act (ACA) is destabilizing the health insurance market. Whether Congress will act to repeal, replace, or change the ACA is not known at this time. Therefore, the national and state trends remain uncertain.

Source: Wyoming Insurance Department

National Trends

Deregulation will allow banks to invest more in customers and less on risk mitigation.

Battle for Talent: Companies are looking for bankers able to consistently execute on being a trusted advisor to client senior management teams while also selling the full product solution set. There are plenty of bankers available in the market, but far too few with this advisory skill set.

Asset Management: Mutual funds have experienced positive growth, outpacing etfs last year. Hedge funds have experienced steady 5 year growth and private equity investments have continued a trend of strong asset appreciation. Investor behavior: millennials have different risk tolerances, income, and seek alternate means of investing to the traditional brokerage firm

Technology is poised to transform the industry, including mobile capabilities, Open APIs (which gives programs ability to interface with banking systems), artificial intelligence and virtual reality.

Financial tech startup firms will decrease in number. As most ventures require larger partners to succeed, dominant brands will emerge.

Real Estate, Rental and Leasing Trends

Industry Outlook: Modest GDP growth could temper pace of commercial real estate transaction activity. Interest rates are likely to rise in the near future, increasing mortgage costs and deterring real estate investments to some extent.

Disruption: Startups like Airbnb or we work are disrupting the way organizations lease and use commercial real estate. Online leasing is more cost and time effective, which threatens traditional brokerages. STEM workers are needed to keep up with technology advancements, but are in short supply. Pay per use models disrupt traditional sales and leasing.

Real Estate Investment Trusts: Traditionally used for large property management. Real estate owners must creatively reuse space vacated by anchor retailers. Credit availability may be a concern in the future. New accounting standards on real estate investment trusts will increase administration costs

Homebuilder confidence is high, but builders cannot complete projects fast enough due to a shortage of workers and delays from permits and regulations. Homebuilders are also building more rental units

Industry Focus Around the State

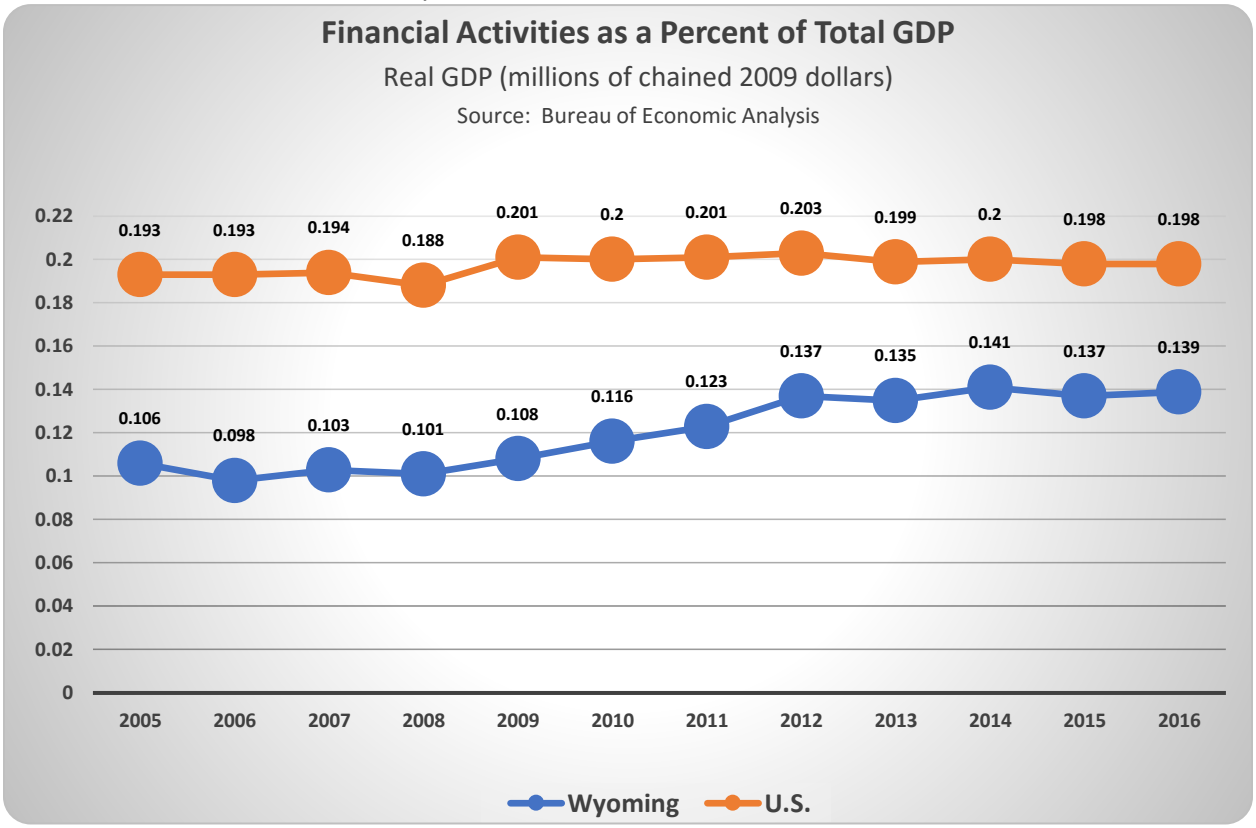
In the ENDOW Regional Assessment, communities identified the Financial Activities sector as an important focus, and offshore investment was specified as a specific focus industry.

How does Wyoming compare?

WY Financial Activities as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	**Total GDP**	**Financial Activities**	**% of Total GDP**
2005	$29,637	$3,131	10.6%
2010	$36,469	$4,216	11.6%
2016	$34,439	$4,783	13.9%

U.S. Financial Activities as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	**Total GDP**	**Financial Activities**	**% of Total GDP**
2005	$14,203,241	$2,742,167	19.3%
2010	$14,628,165	$2,925,476	20.0%
2016	$16,342,925	$3,228,004	19.8%

Source: Bureau of Economic Analysis



Over the next 20 years, if Wyoming increases the 13.9% Finance GDP to equal the 19.8% GDP of the US, the 6% increase would equate to $2 billion.

Wyoming and United States Financial Activities Sector GDP Real GDP (millions of chained 2009 dollars)								
Industry	2005				2010			
	WY		U.S.		WY		U.S.	
Financial Activities	**GDP**	**% of Total GDP**	**GDP**	**% of Total GDP**	**GDP**	**% of Total GDP**	**GDP**	**% of Total GDP**
Fed. Reserve Banks, Credit Intermediation, and Related Services	$ 374	12.0%	$ 374,834	13.7%	$ 393	9.3%	$ 388,275	13.3%
Securities, Commodity Contracts, and Investments	$ 62	2.0%	$ 211,698	7.7%	$ 56	1.3%	$ 192,176	6.6%
Insurance Carriers and Related Activities	$ 199	6.36%	$ 345,173	12.59%	$ 223	5.29%	$ 359,654	12.29%

Industry	2015			
	WY		U.S.	
Financial Activities	**GDP**	**% of Total GDP**	**GDP**	**% of Total GDP**
Fed. Reserve Banks, Credit Intermediation, and Related Services	$ 317	6.5%	$ 374,084	11.7%
Securities, Commodity Contracts, and Investments	$ 57	1.2%	$ 163,724	5.1%
Insurance Carriers and Related Activities	$ 268	5.49%	$ 449,534	14.09%

States with the Highest and Lowest Shares of Financial Activities, 2016

(as a Percentage of Their Gross State Product)

Top Five States

Delaware	44.2%
New York	29.8%
Connecticut	26.6%
Rhode Island	23.9%
New Hampshire	23.2%

Bottom Five States

Louisiana	13.7%
Texas	13.5%
West Virginia	12.8%
Oklahoma	12.4%
Alaska	11.8%

In 2016, Wyoming ranked 45th in the nation at 13.9%

Manufacturing plays a significant role in our national economy, accounting for roughly 20 percent of the United States GDP. Wyoming would rank 19th in the nation for manufacturing if we grow our GDP to 20 percent.

Percentage Financial Activities Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Financial Activities GDP	% of Total GDP
Wyoming	$4,783	13.9%
Alaska	$5,596	11.8%
Colorado	$55,552	19.0%
Idaho	$10,334	17.3%
Montana	$7,050	17.2%
New Mexico	$13,746	16.0%
North Dakota	$7,533	15.8%
South Dakota	$9,163	22.0%
Utah	$29,072	21.3%
United States	$3,228,004	19.8%

Source: Bureau of Economic Analysis

Percentage Financial Activities Contributes to Total Employment

2016

	Financial Activities Employment	% of Total Employment
Wyoming	10,830	4.0%
Alaska	11,740	3.6%
Colorado	157,719	6.2%
Idaho	29,880	4.3%
Montana	20,651	4.5%
New Mexico	32,292	4.0%
North Dakota	23,137	5.5%
South Dakota	28,810	6.9%
Utah	81,728	5.9%
United States	7,953,144	5.6%

Source: Bureau of Labor Statistics

Wyoming and United States Financial Activities Sector Establishments								
Industry	2005				2010			
	WY		U.S.		WY		U.S.	
Financial Activities	**#**	**% of Total Financial Activities**	**#**	**% of Total Financial Activities**	**#**	**% of Total Financial Activities**	**#**	**% of Total Financial Activities**
Monetary Authorities - Central Bank	NA		253	0.0%	NA		399	0.0%
Credit Intermediation and Related Activities	369	18.8%	192,250	23.6%	400	18.4%	184,339	22.6%
Securities, Commodity Contracts, Investments	167	8.5%	80,262	9.9%	227	10.4%	93,143	11.4%
Insurance Carriers and Related Activities	426	21.6%	181,838	22.3%	465	21.3%	181,290	22.2%
Funds, Trusts, and Other Financial Vehicles	13	0.7%	7,778	1.0%	31	1.4%	7,590	0.9%

Industry	2016			
	WY		U.S.	
Financial Activities	**#**	**% of Total Financial Activities**	**#**	**% of Total Financial Activities**
Monetary Authorities - Central Bank	NA		272	0.0%
Credit Intermediation and Related Activities	378	17.1%	180,130	21.0%
Securities, Commodity Contracts, Investments	216	9.8%	104,350	12.2%
Insurance Carriers and Related Activities	482	21.8%	192,055	22.4%
Funds, Trusts, and Other Financial Vehicles	31	1.4%	4,059	0.5%

Businesses in the Sector

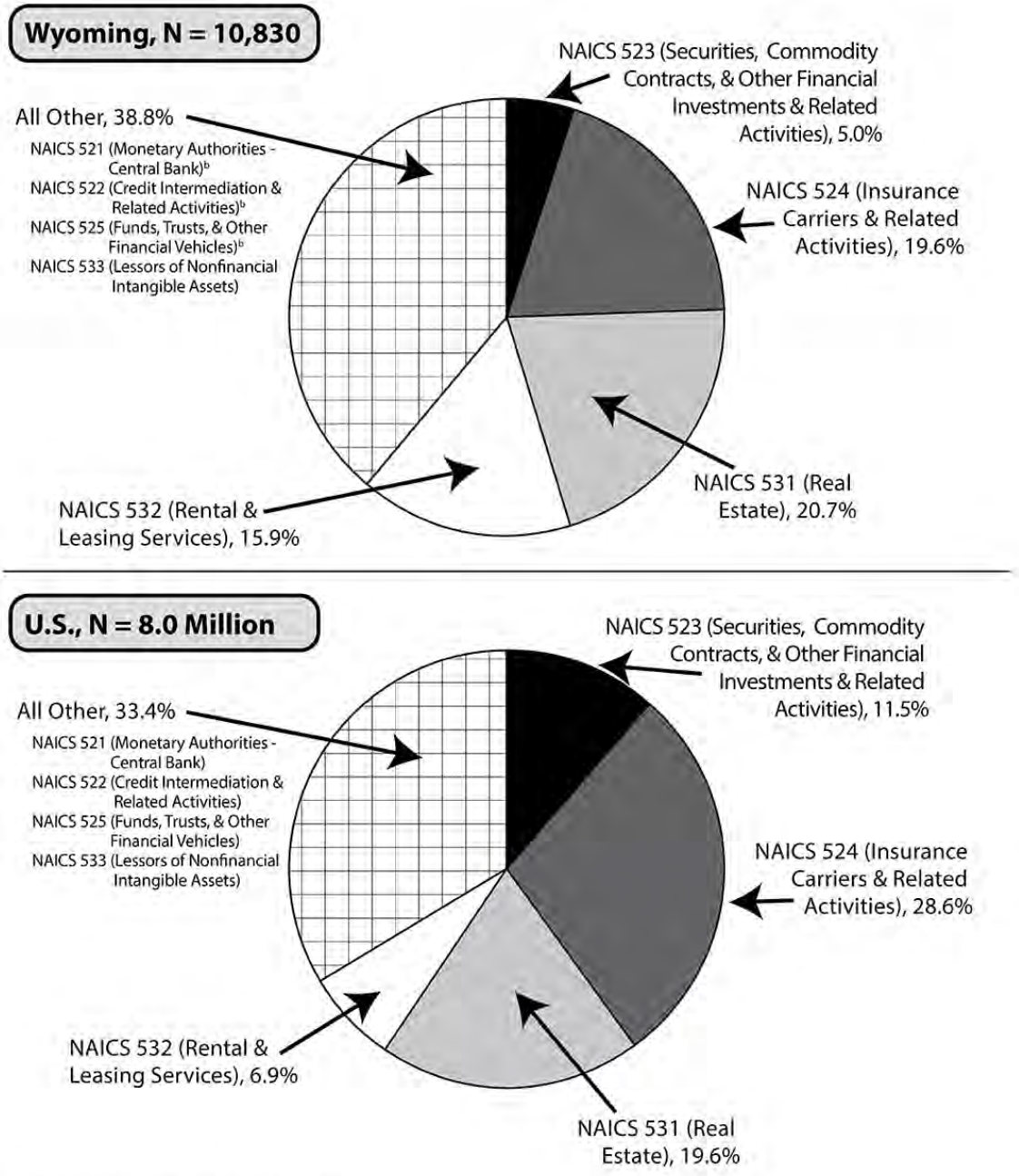
Firms in Wyoming	
Total Firms	2,430
Average Age	11
Number Firms Under 5 Years Old	872
Number Firms 5-9 Years Old	543
Number Firms over 10 Years Old	1,015

Wyoming and United States Firms, Employees and Annual Wage (2016)

		Wyoming			United States		
NAICS Code	Industry	Firms	Employees	Annual Wages	Firms	Employees	Annual Wages
52-53	Finance, Insurance, Real Estate and Rental and Leasing	2,215	10,830	52,395	857,177	7,953,144	88,822
521	Monetary authorities - central bank	0	0	0	272	18,779	116,672
522	Credit intermediation and related activities	378	0	0	180,130	2,601,522	78,814
523	Securities, commodity contracts, investments	216	546	103,738	104,350	917,950	211,671
524	Insurance carriers and related activities	482	2,126	49,851	192,055	2,278,520	81,924
525	Funds, trusts, and other financial vehicles	31	0	0	4,059	10,031	135,175
531	Real estate	852	2,237	35,565	318,378	1,554,898	56,484
532	Rental and leasing services	249	1,720	50,800	54,855	547,974	48,579
533	Lessors of nonfinancial intangible assets	7	47	113,497	3,079	23,470	102,836

NAICS[a] 52-53: Finance, Insurance, Real Estate & Rental & Leasing

Distribution of Jobs by 3-Digit NAICS Code in Wyoming and the U.S., 2016 Annual Average



[a]North American Industry Classification System.
[b]NAICS 521, 522, and 525 for Wyoming are not discloseable due to confidentiality.
Source: Quarterly Census of Employment and Wages. U.S. Bureau of Labor Statistics.
Prepared by T. Glover and M. Moore, Research & Planning, WY DWS, 7/21/17.

Workforce

Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	1,443	13,664	$41,530
Colorado	2005	20,898	153,677	$55,018
Idaho	2005	5,018	27,723	$38,088
Montana	2005	3,494	21,234	$36,882
New Mexico	2005	4,881	33,617	$37,641
North Dakota	2005	2,425	18,334	$35,758
South Dakota	2005	2,894	28,063	$36,776
Utah	2005	9,513	67,582	$42,882
Wyoming	2005	1,968	10,771	$36,344
US	2005	813,710	8,037,851	$64,397

State	Year	Firms	Employees	Annual Wage
Alaska	2010	1,426	13,673	$50,693
Colorado	2010	19,636	139,584	$62,655
Idaho	2010	5,203	26,882	$41,610
Montana	2010	3,679	20,020	$43,729
New Mexico	2010	5,031	31,153	$44,970
North Dakota	2010	2,551	19,934	$44,391
South Dakota	2010	3,009	28,412	$43,390
Utah	2010	9,666	67,980	$49,726
Wyoming	2010	2,179	10,792	$44,094
US	2010	816,669	7,401,812	$73,976

State	Year	Firms	Employees	Annual Wage
Alaska	2016	1,393	11,740	$55,652
Colorado	2016	21,703	157,719	$79,184
Idaho	2016	5,279	29,880	$52,521
Montana	2016	3,933	20,651	$54,130
New Mexico	2016	5,131	32,292	$52,635
North Dakota	2016	2,989	23,137	$57,896
South Dakota	2016	3,216	28,810	$55,399
Utah	2016	10,684	81,728	$62,981
Wyoming	2016	2,215	10,830	$52,404
US	2016	857,177	7,953,144	$88,822

Occupations in Finance

Title	Mean Hourly	Mean Annual	Median Hourly	Median Annual
Total all occupations	$23	$48,347	$18	$37,406
Management Occupations	$46	$96,677	$40	$83,681
Top Executives	$55	$114,582	$49	$101,062
Chief Executives	$68	$141,217	$69	$143,037
General and Operations Managers	$54	$113,185	$47	$98,649
Operations Specialties Managers	$56	$116,819	$50	$103,125
Financial Managers	$56	$117,157	$48	$100,500
Other Management Occupations	$26	$54,771	$22	$45,567
Property, Real Estate, and Community Association Managers	$26	$54,408	$22	$45,290
Business and Financial Operations Occupations	$35	$72,404	$29	$60,209
Business Operations Specialists	$29	$61,104	$27	$56,916
Claims Adjusters, Examiners, and Investigators	$31	$64,564	$31	$64,918
Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	$33	$68,496	$30	$62,462
Human Resources Specialists	$27	$55,772	$25	$51,233
Training and Development Specialists	$23	$46,924	$19	$39,563
Market Research Analysts and Marketing Specialists	$26	$53,047	$23	$47,491
Financial Specialists	$36	$74,688	$29	$60,900
Accountants and Auditors	$35	$72,876	$31	$64,669
Appraisers and Assessors of Real Estate	$31	$65,148	$29	$60,566
Credit Analysts	$22	$46,595	$22	$45,843
Financial Analysts	$79	$163,493	$66	$138,111
Personal Financial Advisors	$56	$117,478	$36	$75,377
Insurance Underwriters	$31	$63,677	$28	$58,630
Financial Examiners	$28	$58,612	$29	$59,303
Loan Officers	$31	$64,858	$29	$60,294
Computer and Mathematical Occupations	$28	$58,881	$28	$58,259
Computer Specialists	$27	$56,384	$24	$50,259
Computer Systems Analysts	$35	$72,065	$33	$68,089
Network and Computer Systems Administrators	$23	$48,495	$22	$46,716
Computer User Support Specialists	$23	$47,165	$21	$43,056
Legal Occupations	$24	$49,765	$22	$44,826
Legal Support Workers	$22	$46,003	$21	$44,397
Title Examiners, Abstractors, and Searchers	$22	$46,061	$21	$44,663
Arts, Design, Entertainment, Sports, and Media Occupations	$22	$45,162	$21	$44,303
Healthcare Practitioners and Technical Occupations	$30	$62,060	$25	$51,612
Health Diagnosing and Treating Practitioners	$34	$70,359	$33	$68,093
Respiratory Therapists	$26	$54,935	$24	$48,991
Building and Grounds Cleaning and Maintenance Occupations	$16	$34,035	$15	$31,057
Building Cleaning and Pest Control Workers	$16	$32,821	$13	$27,968
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$16	$33,859	$13	$26,671
Maids and Housekeeping Cleaners	$14	$29,809	$14	$29,974

Sales and Related Occupations	$24	$49,416	$18	$36,929
Supervisors, Sales Workers	$26	$53,914	$25	$52,741
First-Line Supervisors of Retail Sales Workers	$24	$50,394	$23	$47,656
First-Line Supervisors of Non-Retail Sales Workers	$31	$64,377	$28	$58,841
Retail Sales Workers	$14	$28,964	$13	$26,158
Counter and Rental Clerks	$14	$28,463	$13	$27,299
Retail Salespersons	$12	$23,995	$11	$22,955
Sales Representatives, Services	$27	$55,319	$21	$42,771
Insurance Sales Agents	$25	$52,494	$21	$43,726
Securities, Commodities, and Financial Services Sales Agents	$30	$62,002	$19	$40,086
Sales Representatives, Services, All Other	$23	$46,917	$15	$30,966
Sales Representatives, Wholesale and Manufacturing	$35	$71,961	$30	$62,629
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	$35	$71,961	$30	$62,629
Other Sales and Related Workers	$40	$82,431	$30	$61,927
Real Estate Brokers	$26	$53,826	$24	$49,830
Office and Administrative Support Occupations	$16	$34,009	$15	$31,410
Supervisors, Office and Administrative Support Workers	$24	$50,497	$23	$47,828
First-Line Supervisors of Office and Administrative Support Worke	$24	$50,497	$23	$47,828
Communications Equipment Operators	$14	$28,572	$14	$28,427
Switchboard Operators, Including Answering Service	$14	$28,615	$14	$28,461
Financial Clerks	$14	$29,426	$14	$28,254
Bill and Account Collectors	$20	$40,846	$19	$40,003
Billing and Posting Clerks and Machine Operators	$16	$34,203	$16	$33,871
Bookkeeping, Accounting, and Auditing Clerks	$19	$40,289	$19	$39,801
Tellers	$13	$26,754	$13	$26,366
Financial Clerks, All Other	$16	$33,204	$16	$33,196
Information and Record Clerks	$16	$33,245	$15	$32,165
Brokerage Clerks	$22	$46,572	$23	$47,295
Credit Authorizers, Checkers, and Clerks	$20	$40,722	$19	$38,664
Customer Service Representatives	$15	$30,388	$14	$29,399
Loan Interviewers and Clerks	$17	$35,583	$17	$35,396
New Accounts Clerks	$16	$33,417	$16	$32,380
Receptionists and Information Clerks	$13	$27,706	$13	$27,744
Material Recording, Scheduling, Dispatching, and Distributing Workers	$22	$45,935	$23	$47,231
Dispatchers, Except Police, Fire, and Ambulance	$28	$58,214	$28	$58,706
Secretaries and Administrative Assistants	$17	$36,178	$16	$34,057
Executive Secretaries and Executive Administrative Assistants	$24	$48,884	$21	$44,538
Secretaries and Administrative Assistants, Except Legal, Medical,	$17	$34,657	$16	$33,040
Other Office and Administrative Support Workers	$16	$33,579	$16	$32,745
Computer Operators	$20	$41,250	$21	$42,917
Insurance Claims and Policy Processing Clerks	$17	$35,093	$17	$34,377
Mail Clerks and Mail Machine Operators, Except Postal Service	$13	$27,615	$12	$25,481
Office Clerks, General	$15	$31,829	$14	$30,103

Construction and Extraction Occupations	$20	$41,022	$20	$42,454
Installation, Maintenance, and Repair Occupations	$19	$38,535	$17	$36,189
Supervisors of Installation, Maintenance, and Repair Workers	$29	$59,394	$24	$50,634
First-Line Supervisors of Mechanics, Installers, and Repairers	$29	$59,394	$24	$50,634
Electrical and Electronic Equipment Mechanics, Installers, and Repairers	$20	$42,356	$20	$42,427
Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	$23	$47,729	$22	$45,626
Mobile Heavy Equipment Mechanics, Except Engines	$25	$51,446	$24	$48,916
Outdoor Power Equipment and Other Small Engine Mechanics	$18	$37,214	$18	$37,247
Other Installation, Maintenance, and Repair Occupations	$16	$32,896	$15	$31,009
Industrial Machinery Mechanics	$24	$49,520	$23	$47,937
Maintenance and Repair Workers, General	$15	$31,139	$14	$29,785
Production Occupations	$24	$49,049	$24	$50,766
Inspectors, Testers, Sorters, Samplers, and Weighers	$18	$38,361	$18	$37,712
Transportation and Material Moving Occupations	$19	$39,032	$18	$37,061
Supervisors, Transportation and Material Moving Workers	$30	$62,073	$25	$52,561
Motor Vehicle Operators	$21	$43,054	$20	$41,258
Heavy and Tractor-Trailer Truck Drivers	$22	$45,941	$22	$45,068
Light Truck or Delivery Services Drivers	$20	$41,900	$18	$37,428
Material Moving Workers	$16	$33,330	$14	$28,882
Cleaners of Vehicles and Equipment	$12	$24,176	$12	$24,187
Laborers and Freight, Stock, and Material Movers, Hand	$18	$37,825	$16	$33,706

Exports

No international exports from Wyoming, according to US Import and Export Trade Statistics

Enablers

Finance, Insurance, Real Estate, and Rental & Leasing
Enablers
No-corporate or personal income tax
Laws favorable for trust industry
Incentives
Challenge Loan
USDA, SBA loan programs
Challenges
Significant barriers to entry (legal, regulatory, etc.) for startups
Real estate development costs are higher in rural areas
Heavily focused in two area of state (Jackson and Cheyenne)

Industry Input

The following are positive considerations for growth in this industry:

Low tax rates

Business friendly environment

Progressive attitudes toward growth

State insurance laws that allow for change and growth

-State of Wyoming Insurance Department

Obstacles

See Above and

Industry Input

Regulatory environment, bank consolidations, fintechs who may deliver similar products with less regulation and oversight.

In order for the community banking model to continue we need to be allowed to compete by being more flexible with loan structures and terms. This isn't easy in the current regulatory environment where they want everything to be the same in order to be fair.

Lack in availability of high speed internet service statewide.

-WY Society of CPA's

The following factors are consistently seen as obstacles to growing the insurance industry in Wyoming, and are especially acute regarding the health insurance market:

Low population

Large geographic area

Older population and declining younger percentages

Higher smoking rates than the national average

Limited numbers of medical providers and health insurance carriers

One of the largest obstacles to economic diversity in the state is the lack of available and sustainable air service.

-State of Wyoming Insurance Department

Opportunities

See above

Industry Input

Family Trusts

Industry consolidation also creates opportunities for those of us who are large enough to efficiently continue to compete. Because the Wyoming market is small and underserved, it creates an opportunity for those who understand the needs of our communities.

-Kim DeVore

Develop avenues to bring several generations together to create the accounting profession of the future.

Develop and expand on our partnerships with the University of Wyoming and the various community colleges to better train our workforce. Data analytics has the potential to provide valuable benefits to employers/industries.

Changes in the ACA could provide opportunities to grow or change the health insurance market.

If Wyoming could attract more insurers and medical providers, it could have a positive impact on health insurance costs by creating more competition thereby reducing costs.

-Wyoming Society of CPA's

Professional and Business Services (54-56)

Summary of Sector

Businesses in the Sector

The Professional and Business Services Sector (sometimes called the knowledge sector) comprises companies that perform professional, technical, scientific, administrative, and managerial services for other businesses or entities. These often require a high degree of expertise and training. Companies in this sector perform services such as engineering, research and development, accounting, architecture, legal services, design, computer systems design, advertising, management of companies or enterprises, and administrative and support services. See Appendix 1 for a comprehensive list of NAICS codes in this sector.

Wyoming Compared to Other States

There is tremendous opportunity for growth in this sector, as it contributes significantly less to Wyoming's economy than it does to other states and the US. It makes up 4.5% of Wyoming's GDP. Over the next 20 years, Wyoming can grow its economy by $2.7 billion by increasing the Professional and Business Services 4.5% contribution to the Wyoming GDP to the US contribution of 12.8%.

Workforce

Wages within this sector pay above the mean and median for all occupations. However, Wyoming wages in this sector are low compared to most comparator states.

Barriers, Assets, Enablers and Trends

One of the most significant barriers to this sector in Wyoming is small current workforce, and challenged recruitment and retention of new workforce. Livability and amenities enable that recruitment and retention. Lack of widespread, fast, cost-competitive broadband and limited reliable air service are infrastructure gaps that have also been identified as barriers to this sector in Wyoming.

Opportunities in this sector include growing Professional and Business services that are traditionally performed out of state, and leveraging Wyoming's robust natural resource base (e.g. minerals, oil and gas, agriculture) to drive growth in research and development, tech companies, and other professional and business services entities.

Automation, continued innovation in models (e.g. "Uberization"), and increased funding for research and development are some emerging trends within this sector.

Trends

Trends from select industries within the Professional and Business Services Sector

Engineering

Industry Input

Wyoming Engineering Society has been looking into the amount of Licensed Professional Engineers and Engineers-in-Training in the State of Wyoming. The number of in-state engineers appears to be trending upward.

ACEC (American Council of Engineering Companies) of Wyoming is also starting to study Enablers, Incentives, Challenges, Obstacles and Opportunities for Consulting Firms in Wyoming.

-Wyoming Engineering Society

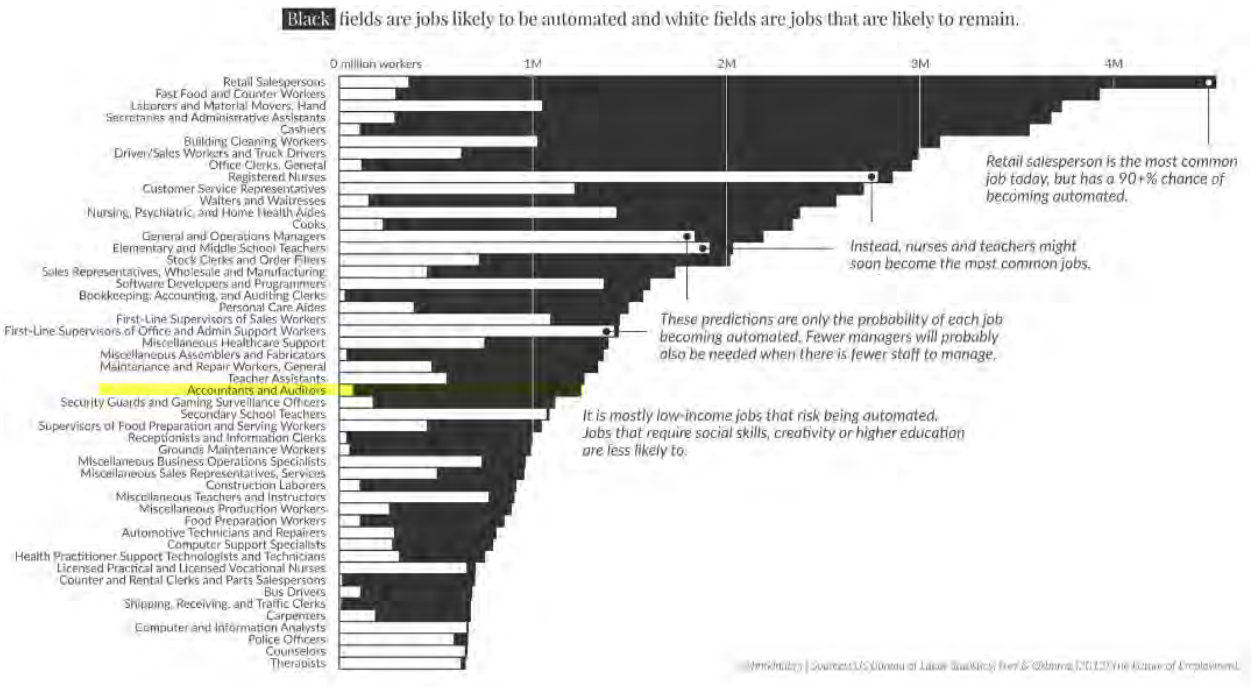
Legal Services

- Economic Outlook: Market is growing. Areas experiencing the fastest growth are regulatory compliance, mergers/acquisitions, and litigation.
- Technology: Firms are looking for better, more relevant technologies, to be used and shared on integrated platforms
- Market Shift: Customers desire more comprehensive integrated advice approach including
    - Industry, Commercial or Non-Legal Expertise
    - Digital, Data Privacy and Cyber Security
    - Regulatory
    - Proactive knowledge sharing
    - Integration between legal practice areas
    - Financial expertise
- Pricing: Customers prefer fixed fees, capped fees or some form of value based pricing.

Source: https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Legal/dttl-legal-future-trends-for-legal-services.pdf

Accounting Services

- Everyone on the cloud: 90% of small and medium sized businesses will utilize cloud services for accounting by the end of 2017.
- Clients are more fluid: Because of advances in cloud based technology, clients have easier access to their information. This makes it much easier to switch providers; cloud based accounting firms add five times more clients than equivalent traditional firms.
- Data from cloud based systems is more readily available: Data is now available to anyone with a device and an internet connection. An automated, real-time supply of financial data from your clients opens up a whole new area of service. For a start, you can use cloud apps to offer different packages within the realm of compliance.
- Do it yourself accounting is becoming easier.
- Compliance prices will plummet by 50% or more over time. As checking compliance with regulations becomes more automated and less labor intensive, prices will drop.
- Time based billing is on its way out. Accounting will continue to become more about intellectual property and less about labor. Price up front will become the new standard.
- Desired skill sets are changing: As accounting becomes more automated, successful companies will retain talent with marketing, creative and sales oriented skill sets. Coaches and consultants will own long-term relationships with clients. (Chart below shows an estimate of jobs automated in the next 25 years, based on 2016 employment levels)



Sources:

http://blog.receipt-bank.com/accounting-trends-2017/ (Written by Henry Bell, who is also the author of How Automation is Transforming Accountancy)

http://www.accountex.co.uk/12-predictions-on-the-future-of-the-accounting-profession/

Management and Consulting Services

- Multi-Sourcing: There is an accelerating trend away from the old days where one large consulting firm would be retained to execute a substantial project for a corporate client. Experts predict that we will see more arrangements where clients press multiple consultancies to collaborate on projects.
- Uberization : The emergence of the “gig” economy—sometimes referred to as the Uberization of America—may well have a growing impact on the consulting industry as 2016 marches onward. Consulting services may be seen as a more commoditized, transactional type of interaction rather than as a professional long-term service partnership.
- Largest Markets: As has been the case for the last several years, industry experts predict that Healthcare will continue to lead the way as the most attractive vertical market in the industry. In addition to Healthcare, analysts forecast that the Energy vertical will regain its footing as the market is acclimating to new pricing realities.
- Talent: The consulting business has always been about the people doing the work. A consulting firm is only as successful as the talent of its people and their abilities to achieve measurable results for clients.

- Offshoring: More companies are considering the balance of high cost and low cost firms, says Fiona Czerniawska, an author and recognized authority on the consulting industry. "How many high-paid people do you need and how many less expensive people? Do they have to be in the same firm? If not, how do you join them together?"

- Automation: The emergence of sophisticated Artificial Intelligence technologies is likely to enable consulting firms to automate some important functions that human beings used to provide. Although it's unlikely that consultants need to be concerned about their jobs being displaced by robo-consultants, experts predict that consulting firms can create a more effective business model by combining technological analysis with human capital.6
- Disruptive Business Models: Crowdsourced consulting is a model which allows multiple companies to share in the cost and results of a project. On demand platforms allow companies to outsource portions of a project with smaller firms.

Source: https://www.lexisnexis.nl/__data/assets/pdf_file/0005/256352/Consulting-Industry-Report.pdf

Research and Development

Research and development (R&D) includes basic research, applied research, and experimental development; and investment on R&D occupies a prime position in global expenditure. Governments recognize R&D as a crucial investment for a nation's progress, international competitiveness, and public benefit. As a result, R&D intensity – the percentage of GDP that is invested on R&D – is highly discussed in international circles as it provides a broad picture of a country's economic strength and future growth. The recently released report by The International Association of Scientific, Technical and Medical Publishers (STM), an international trade association organized and run for the benefit of scholarly, scientific, technical, medical and professional publishers, provides detailed information and projections regarding the global R&D expenditure. Based on the STM report, this post will highlight some interesting bits of information and trends that the scientific community should look out for.

1. Global expenditure on R&D will continue to grow

Globally, the spending on R&D has shown a consistent growth. In the last 13 years, the expenditure went up from $522 billion in 1996 to $1.3 trillion in 2009. The STM report states that the R&D expenditure for 2014 was an estimated $1.6 trillion. Unsurprisingly, three major economic regions comprising North America, the European Union (EU), and Asia are responsible for up to 92% of the global spending on R&D. Overall, the average proportion of national GDP spent on R&D was about 1.7% in 2010, and this drift to invest more on R&D is likely to continue given the emphasis nations are placing on knowledge expansion and innovation. The forerunners in this trend are the US, which is planning to invest 2% of GDP in R&D; and EU, which is targeting 3%. Other nations including the developing ones are equally set to invest more in R&D.

2. Developing countries to increase R&D spending

The recession between the years 2008-2009 had a marked impact on global R&D spending. The annual growth for the Organisation for Economic Co-operation and Development (OECD) countries for 2008–2012 was just half that for 2001–2008 according to the 2014 report by OECD. However, the recession impacted developed nations such as the US and the EU more than the developing ones such as China, India, and Brazil. Therefore, these emerging economies could rise higher in terms of their R&D spending in comparison with the rest of the world. The R&D expenditure in these countries is as follows: Saudi Arabia 0.04%, India 0.8%, Canada 2%, and Sweden 3.7%. While Brazil is looking for a 1.5% investment on R&D, China is expected to be one of the major players in R&D spending in the coming years.

3. China to emerge as the global scientific force

China is the emerging global leader in terms of R&D expenditure and will be the stronghold of science and research in the coming years, the STM report suggests. The report states: "For the first time since WWII, America's leadership is starting to be challenged by China" since China's research spending will exceed the US's by the early 2020s. The indicators of China's growth and future progress are:

Growing R&D expenditure – While China's GDP is rapidly growing, so is its investment on R&D. There was a decline in the shares of global R&D, including the US (from 37% to 30%) and the EU (from 26% to 22%), whereas China's spending has grown exponentially from 0.6% in 1996 to 1.7% of GDP in 2009, which again doubled by 2012. China plans to invest up to 2.5% of its GDP by 2020 with a priority on energy, water resources, and environmental protection.

The growth of knowledge- and technology-intensive (KTI) industries: Across the world, the importance placed on knowledge-intensive economies has risen. Notably, China's KTI industries have multiplied more than five times between 2003 and 2012. Consequently, China's global R&D share went up from 8% to 24% in 2012.

Improved research output: China is one of the nations with the most rapid growth in the number of researchers; it has tripled between 2005 and 2008. Now, China has replaced the UK as the producer of the second largest annual number of research papers. It now holds the share at 11% (NSF 2014), and is likely to overtake the US's research output by 2020. Moreover, the quality of Chinese research is also improving. According to the STM report, the proportion of Chinese articles among the most highly-cited ones has increased six fold between 2002 and 2012 (NSF 2014).

4. Academia and industry will both fund R&D

While the R&D expenditure is majorly funded by industry, academia is also central to funding since research papers originate from academic authors. The industry funds about 66% of R&D costs in the US, 54% in the EU (ranging from 45% in the UK to 70% in Germany), and between 60% and 64% in China, Singapore, and Taiwan. On the other hand, in the US, the academia bears 70% of the R&D expenditure and funds an estimated 18% of the basic research. Another interesting insight the STM report offers is that in the US, life sciences receives about 60% of funding as opposed to medical research that receives only 55%.

5. Global expansion of the researcher community to continue

It is difficult to arrive at a set of figures for the number of researchers across the globe since each country follows a different way of recording the number of researchers in their country. Thus, different reports provide different figures. For instance, the OECD statistics report shows that the number of researchers in OECD countries grew from 4.2 million in 2007 to 8.4 million for 2011, whereas the UNESCO data reports 7.2 million researchers in 2007, an increase from 5.7 million in 2002. However, these and other reports reflect a consistent growth in the

number of researchers globally at the rate of about 4–5% per year. Interestingly, the emerging economies such as those in Asia are seeing a greater annual growth estimated around 8–12%, whereas the growth rate of researchers in developed nations such as the US and the EU is as less as 1%.

Overall, the STM report suggests that fields of science and research will continue to expand and grow in the coming years with the support from both academia and industry. Moreover, R&D is likely to gain more prominence in all countries across the globe in the coming years, particularly in emerging economies such as China and Brazil. Therefore, in an age that is signified by data and knowledge expansion, R&D will spearhead global progress.

Source: https://www.editage.com/insights/the-future-of-science-5-predicted-global-trends-in-rd-expenditure-and-research-output

Industry Focus Around the State

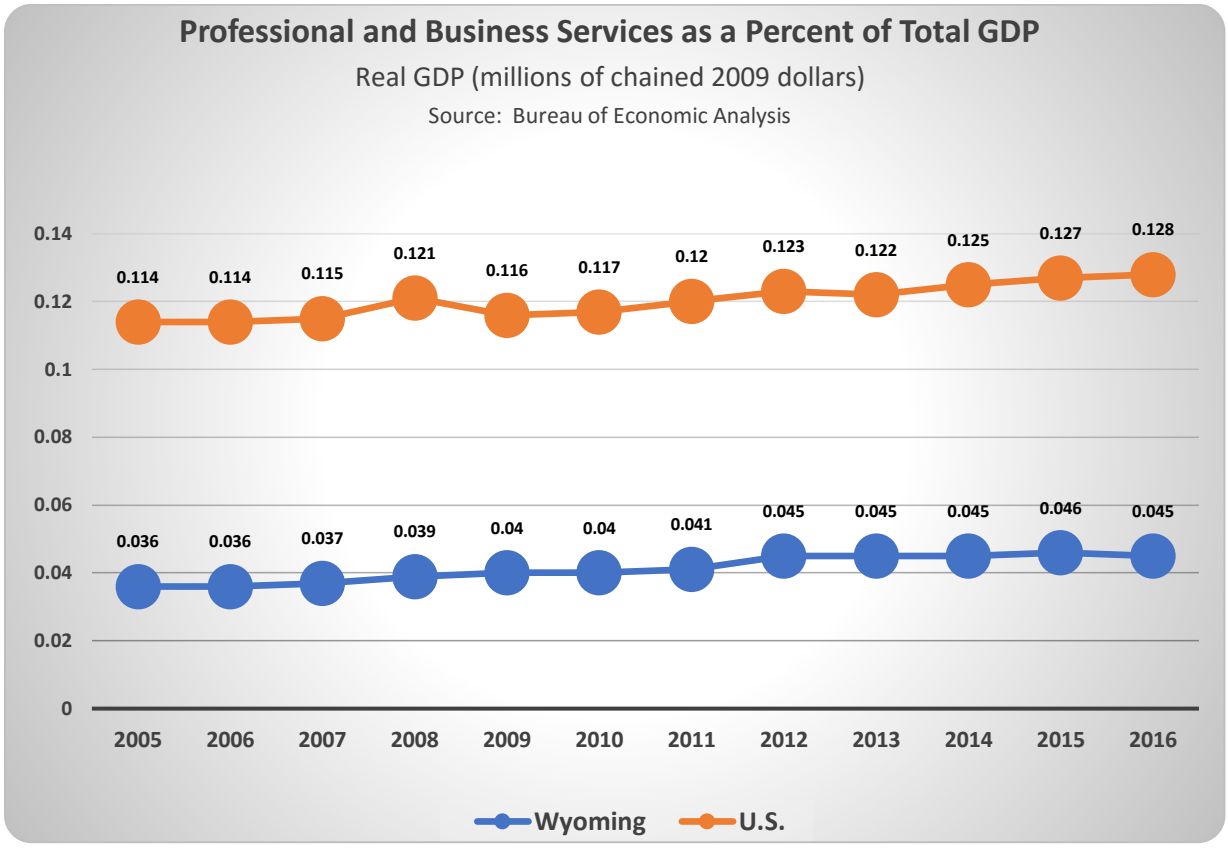
Communities around the state have identified the following specific focus industries within the professional and business services sector. This data was collected using the ENDOW Regional Assessment.

How does Wyoming compare?

WY Professional and Business Services as a % of Total GDP			
	Real GDP (millions of chained 2009 dollars)		
Date	Total GDP	Financial Activities	% of Total GDP
2005	$29,637	$1,076	3.6%
2010	$36,469	$1,451	4.0%
2016	$34,439	$1,534	4.5%

U.S. Professional and Business Services as a % of Total GDP			
	Real GDP (millions of chained 2009 dollars)		
Date	Total GDP	Financial Activities	% of Total GDP
2005	$14,203,241	$1,612,578	11.4%
2010	$14,628,165	$1,718,054	11.7%
2016	$16,342,925	$2,092,952	12.8%

Source: Bureau of Economic Analysis



Over the next 20 years, if Wyoming increases the 4.5% Professional and Business Services GDP to equal the 12.8% GDP of the US, that 8% increase would equate to $2.7 billion dollars.

Wyoming and United States Professional and Business Services Sector GDP

Real GDP (millions of chained 2009 dollars)

	2005				2010			
Industry	**WY**		**U.S.**		**WY**		**U.S.**	
Professional and Business Services	**GDP**	**% of Total Professional and Business Services GDP**	**GDP**	**% of Total Professional and Business Services GDP**	**GDP**	**% of Total Professional and Business Services GDP**	**GDP**	**% of Total Professional and Business Services GDP**
Legal Services	$146	13.6%	$ 223,421	13.9%	$ 158	10.9%	$ 198,190	11.5%
Computer Systems Design and Related Services	$ 47	4.4%	$ 136,742	8.5%	$ 54	3.7%	$ 193,048	11.2%
Miscellaneous Professional, Scientific, and Technical Services	$572	53.2%	$ 568,412	35.2%	$ 704	48.5%	$ 618,515	36.0%
Management of Companies and Enterprises	$118	11.0%	$ 276,145	17.1%	$ 125	8.6%	$ 266,045	15.5%
Administrative and Support Services	$154	14.3%	$ 373,658	23.2%	$ 297	20.5%	$ 398,456	23.2%
Waste Management and Remediation Services	$ 40	3.7%	$ 37,487	2.3%	$ 113	7.8%	$ 44,298	2.6%

Source: Bureau of Economic Analysis

	2015				
Industry	**WY**			**U.S.**	
Professional and Business Services	**GDP**	**% of Total Professional and Business Services GDP**		**GDP**	**% of Total Professional and Business Services GDP**
Legal Services	$141	8.7%		$ 189,739	9.3%
Computer Systems Design and Related Services	$ 84	5.2%		$ 276,097	13.5%
Miscellaneous Professional, Scientific, and Technical Services	$765	47.0%		$ 717,237	35.2%
Management of Companies and Enterprises	$142	8.7%		$ 346,183	17.0%
Administrative and Support Services	$423	26.0%		$ 480,623	23.6%
Waste Management and Remediation Services	$ 82	5.0%		$ 38,572	1.9%

States with the Highest and Lowest Shares of Professional and Business Services, 2016

(as a Percentage of Their Gross State Product)

Top Five States	
Virginia	19.8%
Massachusetts	17.5%
New Jersey	16.8%
Colorado	14.7%
Maryland	14.7%

Bottom Five States	
Iowa	6.8%
South Dakota	6.7%
Alaska	6.6%
North Dakota	6.2%
Wyoming	4.5%

In 2016, Wyoming ranked 50th in the nation at 4.5%

Professional and Business Services plays a significant role in our national economy, accounting for 12.8 percent of the United States GDP. Wyoming would rank 17th in the nation for professional and business services if we grow our GDP to 12.8 percent.

Percentage Professional and Business Services Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Professional and Business Services GDP	% of Total GDP
Wyoming	$1,534	4.5%
Alaska	$3,123	6.6%
Colorado	$43,093	14.7%
Idaho	$6,174	10.3%
Montana	$3,134	7.6%
New Mexico	$8,724	10.1%
North Dakota	$2,965	6.2%
South Dakota	$2,769	6..7%
Utah	$15,971	11.7%
United States	$2,092,952	12.8%

Source: Bureau of Economic Analysis

Percentage Professional and Business Services Contributes to Total Employment

2016

	Professional and Business Services Employment	% of Total Employment
Wyoming	17,776	6.5%
Alaska	28,416	8.7%
Colorado	405,463	15.9%
Idaho	84,631	12.3%
Montana	40,479	8.9%
New Mexico	101,157	12.5%
North Dakota	34,442	8.3%
South Dakota	31,257	7.4%
Utah	200,344	14.4%
United States	20,017,550	14.1%

Source: Bureau of Labor Statistics

Wyoming and United States Professional and Business Services Sector Establishments

Industry	2005				2010			
	WY		U.S.		WY		U.S.	
Professional and Business Services	#	% of Total Professional and Business Services	#	% of Total Professional and Business Services	#	% of Total Professional and Business Services	#	% of Total Professional and Business Services
Professional and Technical Services	2,034	60.6%	902,710	65.8%	2,504	62.2%	1,018,661	66.2%
Management of Companies and Enterprises	126	3.8%	43,239	3.2%	134	3.3%	52,069	3.4%
Administrative and Support Services	1,081	32.2%	404,928	29.5%	1,258	31.2%	442,914	28.8%
Waste Management and Remediation Services	115	3.4%	21,753	1.6%	131	3.3%	24,460	1.6%
	3,356		1,372,630		4,027		1,538,104	

Source: Bureau of Labor Statistics

Industry	2016			
	WY		U.S.	
Professional and Business Services	#	% of Total Professional and Business Services	#	% of Total Professional and Business Services
Professional and Technical Services	2,730	62.1%	1,167,059	66.4%
Management of Companies and Enterprises	147	3.3%	63,327	3.6%
Administrative and Support Services	1,372	31.2%	499,711	28.4%
Waste Management and Remediation Services	146	3.3%	27,441	1.6%
	4,395		1,757,538	

Businesses in the Sector

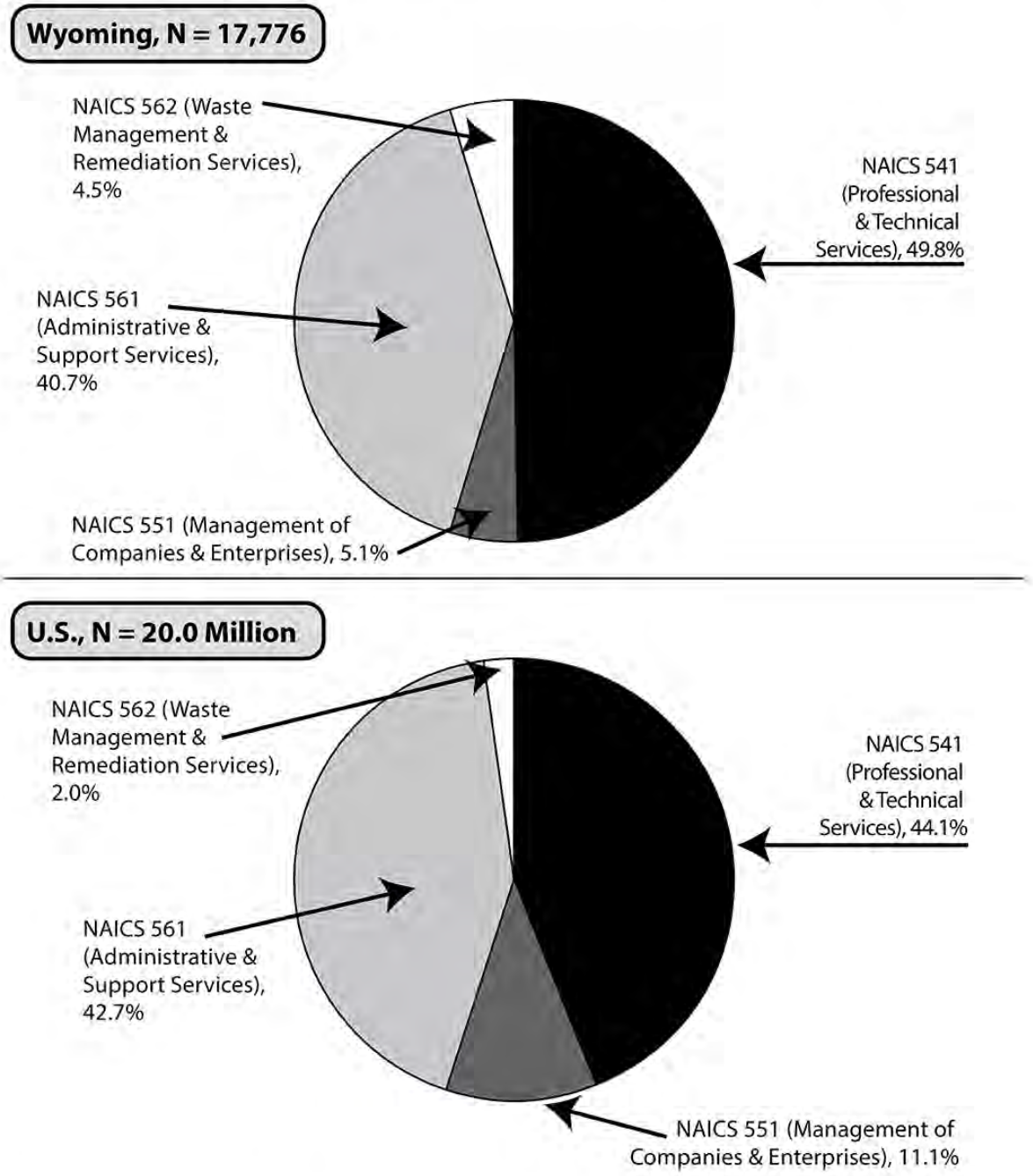
Firms in Wyoming	
Total Firms	4,883
Average Age	8
Number Firms Under 5 Years Old	2,378
Number Firms 5-9 Years Old	1,072
Number Firms over 10 Years Old	1,433

Wyoming and United States Firms, Employees and Annual Wage (2016)

		Wyoming			United States		
NAICS Code	Industry	Firms	Employees	Annual Wages	Firms	Employees	Annual Wages
54-56	Professional and Business Services	4,394	17,776	48,511	1,757,538	20,017,550	69,963
541	Professional and technical services	2,730	8,855	58,647	1,167,059	8,836,939	90,949
551	Management of companies and enterprises	147	900	98,630	63,327	2,229,705	115,102
561	Administrative and support services	1,372	7,230	30,286	499,711	8,550,249	37,085
562	Waste management and remediation services	146	792	44,440	27,441	400,657	57,536

NAICS[a] 54-56: Professional & Business Services

Distribution of Jobs by 3-Digit NAICS Code in Wyoming and the U.S., 2016 Annual Average



[a]North American Industry Classification System.
Source: Quarterly Census of Employment and Wages. U.S. Bureau of Labor Statistics.
Prepared by T. Glover and M. Moore, Research & Planning, WY DWS, 7/21/17.

Workforce

Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	2,859	23,919	$43,615
Colorado	2005	35,798	316,173	$53,938
Idaho	2005	7,604	76,073	$35,718
Montana	2005	5,642	35,119	$31,444
New Mexico	2005	8,188	92,472	$42,059
North Dakota	2005	3,077	26,324	$31,258
South Dakota	2005	3,466	24,264	$33,832
Utah	2005	14,386	144,697	$37,458
Wyoming	2005	3,355	15,848	$35,261
US	2005	1,372,630	16,869,852	$49,574

State	Year	Firms	Employees	Annual Wage
Alaska	2010	3,235	26,225	$55,343
Colorado	2010	40,850	329,851	$65,017
Idaho	2010	8,910	74,113	$42,524
Montana	2010	6,818	39,142	$39,151
New Mexico	2010	9,585	100,062	$53,297
North Dakota	2010	3,398	28,349	$42,613
South Dakota	2010	4,141	27,527	$42,260
Utah	2010	16,157	150,286	$47,137
Wyoming	2010	4,026	17,192	$44,710
US	2010	1,538,104	16,712,011	$60,145

State	Year	Firms	Employees	Annual Wage
Alaska	2016	3,371	28,416	$61,395
Colorado	2016	48,602	405,464	$73,673
Idaho	2016	10,569	84,631	$45,814
Montana	2016	8,266	40,479	$49,443
New Mexico	2016	10,171	101,157	$58,964
North Dakota	2016	4,787	34,441	$57,482
South Dakota	2016	4,874	31,257	$52,667
Utah	2016	20,985	200,344	$54,164
Wyoming	2016	4,394	17,776	$48,520
US	2016	1,757,538	20,017,550	$69,963

Occupations in Professional and Business Services

Title	Mean Hourly	Mean Annual	Median Hourly	Median Annual
Total all occupations	$25	$52,991	$21	$43,304
Management Occupations	$59	$122,783	$48	$99,509
Top Executives	$61	$126,201	$47	$97,233
General and Operations Managers	$61	$126,201	$47	$97,233
Advertising, Marketing, Promotions, Public Relations, and Sales Managers	$52	$107,637	$49	$101,274
Operations Specialties Managers	$52	$108,681	$47	$98,006
Computer and Information Systems Managers	$37	$77,156	$36	$74,715
Financial Managers	$48	$100,002	$43	$90,405
Industrial Production Managers	$69	$144,157	$65	$135,397
Other Management Occupations	$60	$124,029	$53	$109,417
Architectural and Engineering Managers	$60	$124,866	$59	$122,637
Natural Sciences Managers	$54	$112,578	$47	$96,838
Managers, All Other	$71	$146,853	$62	$128,046
Business and Financial Operations Occupations	$40	$82,374	$30	$61,928
Business Operations Specialists	$44	$92,397	$33	$68,517
Purchasing Agents, Except Wholesale, Retail, and Farm Products	$35	$71,797	$36	$74,027
Human Resources Specialists	$24	$50,381	$22	$46,291
Management Analysts	$64	$132,094	$54	$112,208
Training and Development Specialists	$34	$70,634	$28	$58,837
Market Research Analysts and Marketing Specialists	$25	$51,698	$26	$53,715
Business Operations Specialists, All Other	$47	$96,992	$35	$73,444
Financial Specialists	$35	$71,896	$29	$59,602
Accountants and Auditors	$36	$74,938	$29	$60,652
Tax Preparers	$16	$32,590	$12	$24,243
Computer and Mathematical Occupations	$34	$70,336	$30	$62,782
Computer Specialists	$34	$70,157	$30	$62,499
Computer Systems Analysts	$34	$70,521	$33	$68,713
Computer Programmers	$29	$60,971	$27	$55,119
Software Developers, Applications	$35	$72,375	$33	$67,736
Web Developers	$44	$90,950	$30	$62,377
Database Administrators	$30	$61,998	$32	$65,718
Network and Computer Systems Administrators	$38	$78,894	$40	$82,376
Computer User Support Specialists	$22	$45,390	$22	$45,905
Computer Network Support Specialists	$31	$65,034	$32	$67,309
Architecture and Engineering Occupations	$34	$70,760	$30	$63,078
Architects, Surveyors, and Cartographers	$31	$64,250	$30	$62,045
Architects, Except Landscape and Naval	$36	$75,690	$36	$74,317
Landscape Architects	$29	$60,169	$32	$65,919
Cartographers and Photogrammetrists	$30	$63,246	$30	$61,364

Surveyors	$28	$57,835	$27	$56,753
Engineers	$41	$85,416	$37	$76,944
Civil Engineers	$37	$77,938	$35	$73,791
Electrical Engineers	$40	$84,145	$36	$74,578
Environmental Engineers	$43	$88,435	$37	$76,959
Mechanical Engineers	$39	$81,613	$36	$74,692
Mining and Geological Engineers, Including Mining Safety Engineers	$31	$63,897	$29	$59,460
Petroleum Engineers	$53	$109,520	$41	$84,467
Drafters, Engineering, and Mapping Technicians	$22	$46,004	$22	$45,032
Architectural and Civil Drafters	$25	$51,226	$24	$49,300
Civil Engineering Technicians	$21	$43,880	$21	$43,374
Environmental Engineering Technicians	$20	$42,033	$20	$42,455
Surveying and Mapping Technicians	$21	$42,869	$19	$40,472
Life, Physical, and Social Science Occupations	$26	$54,371	$23	$47,279
Life Scientists	$30	$63,399	$27	$55,568
Zoologists and Wildlife Biologists	$25	$52,602	$25	$51,411
Conservation Scientists	$32	$65,614	$31	$64,500
Physical Scientists	$31	$64,880	$28	$59,112
Atmospheric and Space Scientists	$39	$80,817	$41	$85,091
Chemists	$24	$50,211	$24	$50,392
Environmental Scientists and Specialists, Including Health	$30	$63,063	$26	$53,313
Geoscientists, Except Hydrologists and Geographers	$35	$72,550	$35	$72,215
Anthropologists and Archeologists	$25	$52,695	$23	$46,906
Life, Physical, and Social Science Technicians	$18	$38,129	$18	$36,873
Chemical Technicians	$16	$33,935	$16	$33,378
Geological and Petroleum Technicians	$22	$46,092	$19	$40,410
Environmental Science and Protection Technicians, Including Health	$22	$45,100	$22	$44,723
Legal Occupations	$43	$88,550	$29	$60,097
Lawyers, Judges, and Related Workers	$61	$126,077	$43	$90,268
Lawyers	$61	$126,077	$43	$90,268
Legal Support Workers	$22	$46,525	$22	$45,521
Paralegals and Legal Assistants	$23	$47,882	$22	$46,559
Arts, Design, Entertainment, Sports, and Media Occupations	$27	$55,782	$23	$47,924
Art and Design Workers	$28	$58,873	$26	$53,526
Graphic Designers	$22	$46,457	$22	$46,647
Interior Designers	$26	$53,786	$25	$51,448
Media and Communication Workers	$31	$63,738	$23	$48,172
Public Relations Specialists	$39	$80,897	$35	$72,378
Writers and Authors	$19	$39,146	$21	$42,835
Media and Communication Equipment Workers	$13	$26,943	$12	$25,240
Photographers	$11	$23,886	$11	$23,409

Healthcare Practitioners and Technical Occupations	$28	$57,927	$20	$42,125
Health Diagnosing and Treating Practitioners	$37	$77,499	$30	$63,232
Veterinarians	$45	$94,276	$35	$73,803
Registered Nurses	$24	$49,617	$22	$46,446
Health Technologists and Technicians	$14	$29,815	$14	$29,182
Veterinary Technologists and Technicians	$14	$29,815	$14	$29,182
Other Healthcare Practitioners and Technical Occupations	$32	$65,517	$31	$64,652
Occupational Health and Safety Specialists	$32	$66,787	$31	$65,405
Healthcare Support Occupations	$13	$27,226	$13	$26,692
Other Healthcare Support Occupations	$12	$25,280	$12	$25,077
Veterinary Assistants and Laboratory Animal Caretakers	$12	$25,280	$12	$25,077
Protective Service Occupations	$16	$33,295	$15	$31,142
First-Line Supervisors/Managers, Protective Service Workers	$19	$38,693	$17	$35,703
First-Line Supervisors of Protective Service Workers, All Other	$19	$38,480	$17	$35,307
Other Protective Service Workers	$16	$32,787	$15	$30,844
Security Guards	$15	$30,975	$14	$29,340
Crossing Guards	$19	$39,650	$20	$41,339
Food Preparation and Serving-Related Occupations	$10	$21,290	$9	$19,525
Cooks and Food Preparation Workers	$10	$20,455	$9	$19,440
Food and Beverage Serving Workers	$11	$22,242	$12	$24,452
Building and Grounds Cleaning and Maintenance Occupations	$14	$29,772	$14	$28,155
Supervisors, Building and Grounds Cleaning and Maintenance Workers	$23	$47,263	$23	$47,912
First-Line Supervisors of Housekeeping and Janitorial Workers	$23	$48,021	$24	$50,230
Building Cleaning and Pest Control Workers	$13	$27,235	$13	$26,163
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$13	$26,879	$13	$25,994
Pest Control Workers	$23	$47,078	$26	$54,743
Grounds Maintenance Workers	$15	$31,136	$15	$30,631
Landscaping and Groundskeeping Workers	$15	$31,254	$15	$30,816
Personal Care and Service Occupations	$12	$24,257	$12	$25,727
Animal Care and Service Workers	$12	$24,080	$12	$25,182
Nonfarm Animal Caretakers	$12	$24,080	$12	$25,182
Sales and Related Occupations	$37	$77,740	$24	$50,649
Retail Sales Workers	$13	$27,118	$13	$27,223
Cashiers	$11	$23,805	$12	$24,983
Sales Representatives, Services	$34	$70,496	$25	$51,202
Advertising Sales Agents	$30	$62,172	$25	$51,920
Travel Agents	$21	$44,482	$21	$44,357
Sales Representatives, Wholesale and Manufacturing	$79	$164,570	$47	$97,326
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	$88	$183,277	$80	$167,114
Other Sales and Related Workers	$11	$22,459	$11	$22,293

Sales and Related Workers, All Other	$10	$21,240	$10	$20,017
Office and Administrative Support Occupations	$17	$35,049	$16	$32,918
Supervisors, Office and Administrative Support Workers	$26	$53,239	$25	$52,862
First-Line Supervisors of Office and Administrative Support Worke	$26	$53,239	$25	$52,862
Communications Equipment Operators	$13	$27,537	$13	$28,068
Switchboard Operators, Including Answering Service	$13	$27,537	$13	$28,068
Financial Clerks	$18	$37,640	$18	$37,600
Bill and Account Collectors	$20	$41,871	$21	$44,662
Bookkeeping, Accounting, and Auditing Clerks	$18	$37,460	$18	$37,872
Payroll and Timekeeping Clerks	$18	$38,152	$18	$36,528
Information and Record Clerks	$15	$30,516	$15	$30,422
Customer Service Representatives	$14	$30,151	$13	$27,457
File Clerks	$9	$19,339	$9	$19,061
Receptionists and Information Clerks	$14	$28,682	$14	$28,867
Material Recording, Scheduling, Dispatching, and Distributing Workers	$16	$34,139	$15	$31,391
Stock Clerks and Order Fillers	$14	$28,730	$13	$26,703
Secretaries and Administrative Assistants	$18	$38,226	$17	$36,388
Executive Secretaries and Executive Administrative Assistants	$27	$55,352	$26	$53,820
Legal Secretaries	$19	$39,926	$18	$38,006
Secretaries and Administrative Assistants, Except Legal, Medical,	$17	$35,106	$16	$33,696
Other Office and Administrative Support Workers	$15	$31,520	$14	$29,512
Data Entry Keyers	12	24372	11	23688
Mail Clerks and Mail Machine Operators, Except Postal Service	14	28281	12	25833
Office Clerks, General	15	31975	14	30125
Office Machine Operators, Except Computer	13	27489	13	27297
Construction and Extraction Occupations	18	37324	17	35568
Supervisors, Construction and Extraction Workers	23	48558	23	47033
First-Line Supervisors of Construction Trades and Extraction Work	23	48558	23	47033
Construction Trades Workers	17	35309	16	34034
Construction Laborers	15	31961	15	32177
Operating Engineers and Other Construction Equipment Operators	23	47169	22	44942
Plumbers, Pipefitters, and Steamfitters	20	42451	21	43591
Other Construction and Related Workers	18	37676	18	36468
Construction and Building Inspectors	20	41450	18	38058
Hazardous Materials Removal Workers	18	37996	18	37294
Septic Tank Servicers and Sewer Pipe Cleaners	17	34598	17	35134
Extraction Workers	22	45926	19	39616
Installation, Maintenance, and Repair Occupations	28	58285	28	58242

Electrical and Electronic Equipment Mechanics, Installers, and Repairers	40	83349	42	87191
Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	23	47800	22	45341
Bus and Truck Mechanics and Diesel Engine Specialists	24	50475	22	45972
Other Installation, Maintenance, and Repair Occupations	21	42839	19	39485
Maintenance and Repair Workers, General	22	45311	19	40071
Locksmiths and Safe Repairers	15	31956	16	33023
Production Occupations	20	41933	20	41227
Supervisors, Production Workers	32	67281	33	69461
First-Line Supervisors of Production and Operating Workers	32	67281	33	69461
Assemblers and Fabricators	14	29826	14	28113
Team Assemblers	14	29385	13	27377
Assemblers and Fabricators, All Other	15	30357	14	29337
Metal Workers and Plastic Workers	16	32580	14	29675
Other Production Occupations	21	42871	21	43424
Inspectors, Testers, Sorters, Samplers, and Weighers	24	49824	24	49869
Helpers--Production Workers	16	32386	16	33479
Transportation and Material Moving Occupations	16	34052	15	31419
Supervisors, Transportation and Material Moving Workers	25	52442	27	55830
First-Line Supervisors of Transportation and Material-Moving Mach	25	52442	27	55830
Motor Vehicle Operators	17	36326	17	35634
Heavy and Tractor-Trailer Truck Drivers	18	38219	18	37200
Light Truck or Delivery Services Drivers	11	23741	11	23403
Material Moving Workers	15	31781	14	29155
Industrial Truck and Tractor Operators	14	29690	14	28213
Laborers and Freight, Stock, and Material Movers, Hand	15	31924	13	27941
Refuse and Recyclable Material Collectors	16	32349	15	31845

Exports

While there are no tangible export markets, many services in this sector may be performed for entities outside the state, contributing to Wyoming as primary businesses.

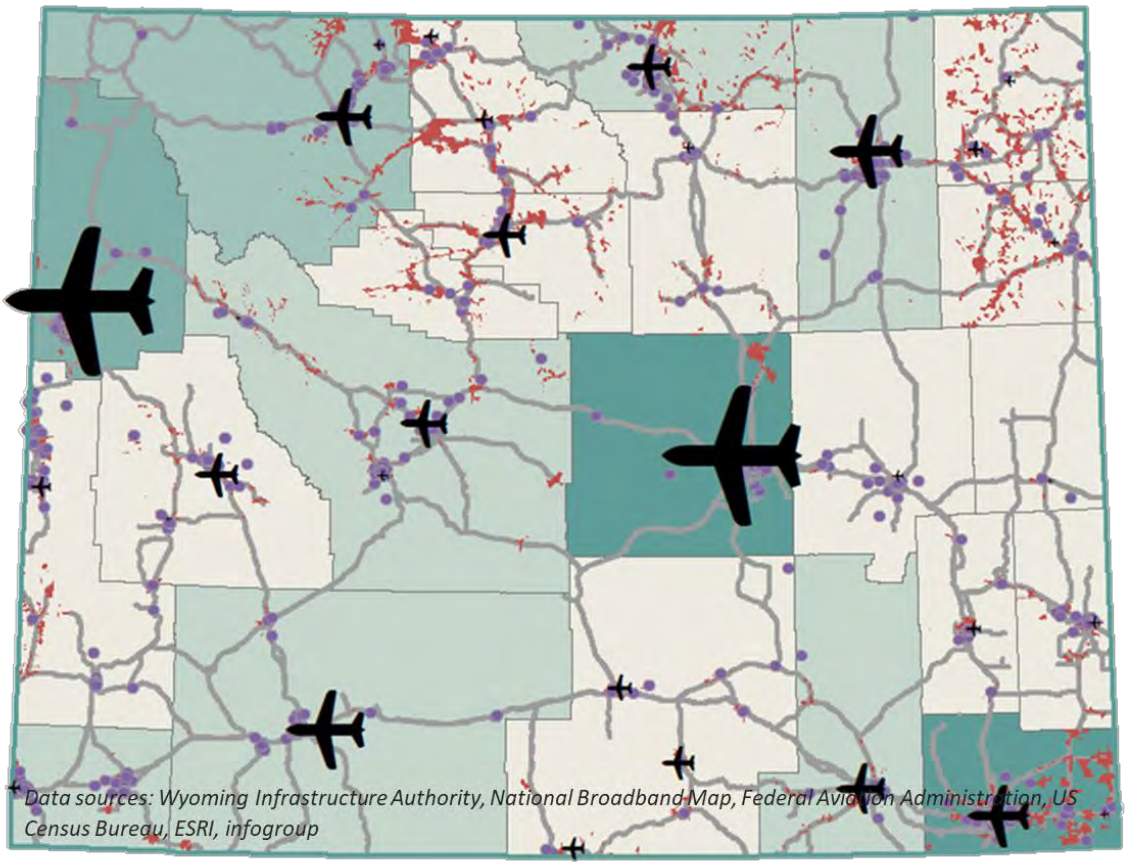
Asset Maps

A baseline for delineating Potential Business Development and Innovation Zones

Mappable Sector Assets

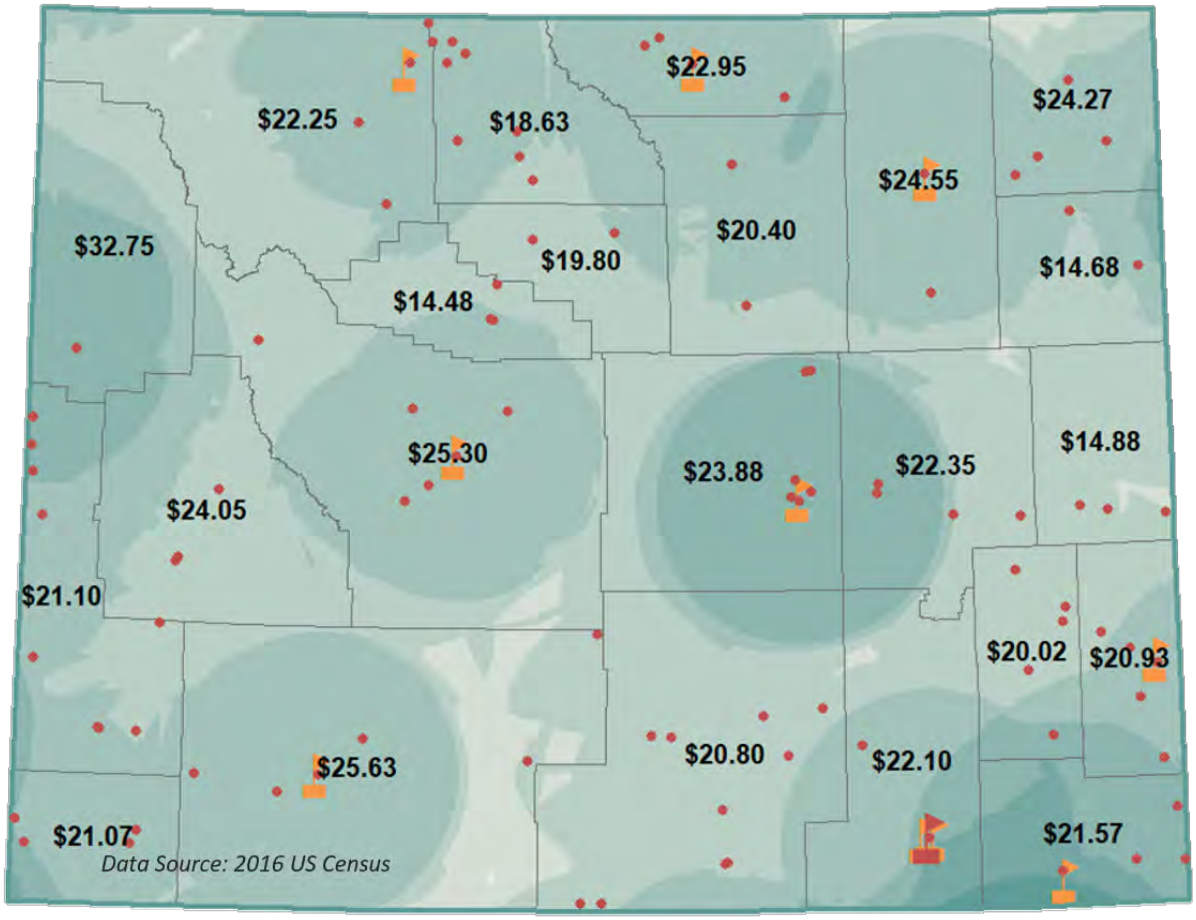
Infrastructure	Workforce
•Broadband •Air Transportation •Existing Clusters	•Numbers •Wages •Livability & Amenities •University and Community Colleges

Infrastructure



Workforce

According to site selector rules of thumb, employees are willing to drive a maximum of ~60 miles to work. Workforce data comes from the 2016 US Census, and includes those who are employed or looking for employment in the Professionl and Business Services Sector.



P & B Services Labor Force
within 60 miles

- 77 - 90
- 91 - 300
- 301 - 900
- 901 - 2,700
- 2,701 - 8,100
- 8,101 - 24,300
- 24,301 - 36,543

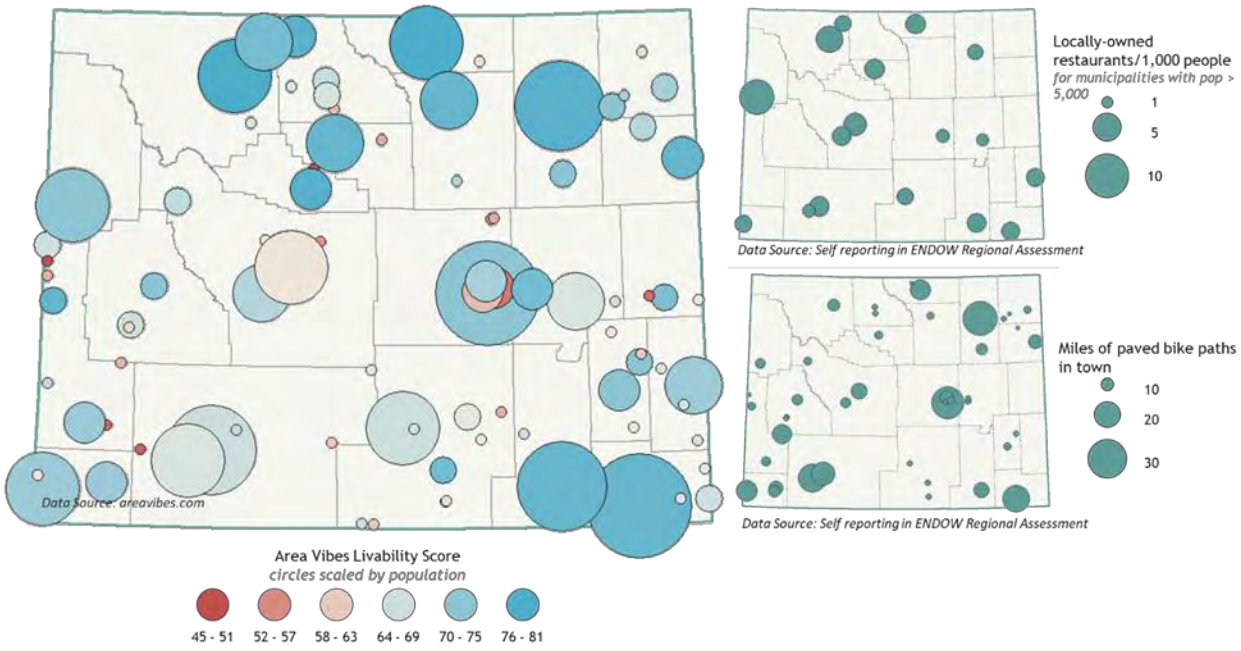
Average Hourly P&B Services Wage shown in each county
no value is shown in counties with no data

- Cities
- Colleges
- Universities

Workforce Enablers

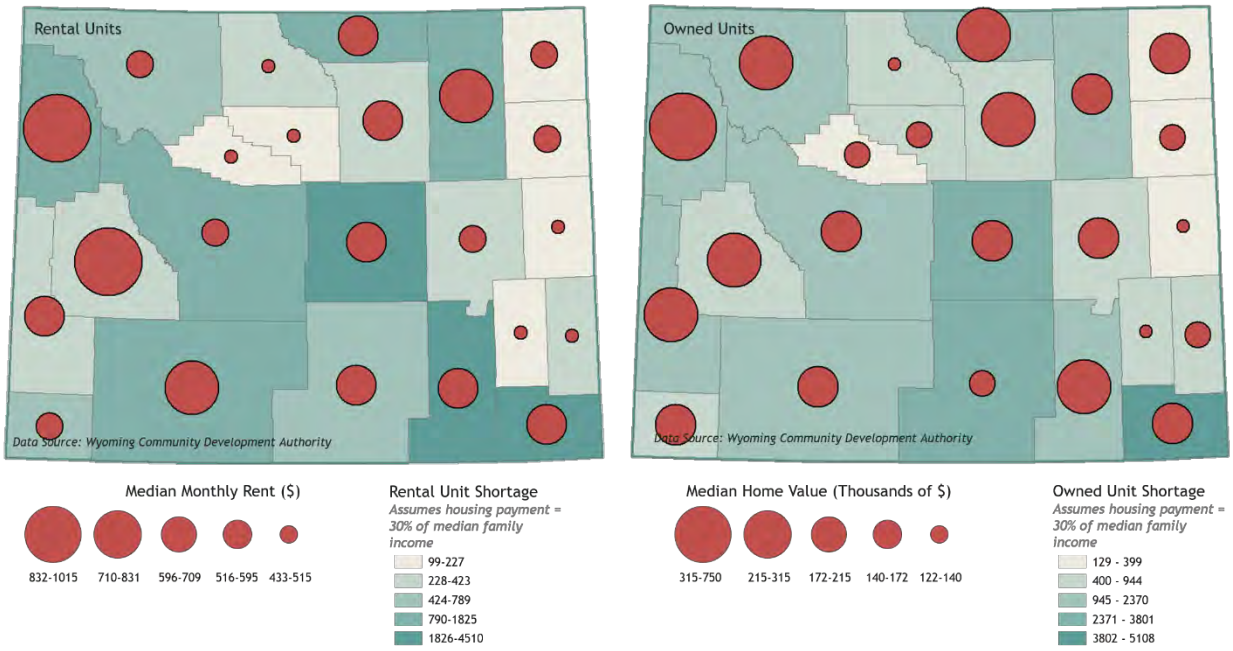
Livability and housing enable recruitment and retention of workforce. According to the International Economic Development Council, access to talent is highly important in the knowledge sector, and 2/3 of 25 to 34-year-olds with college degrees—many of whom contribute to the NAICS 54-56 labor force—choose where they live before looking for a job. (The International Economic Development Council, 2017) Therefore, livability is especially important in this sector.

Livability



Areavibes uses metrics for amenities, cost of living, crime, education, employment, housing, and weather to estimate a livability score on a scale of 0-100. The US average is 66, which corresponds to the duller colors on this map

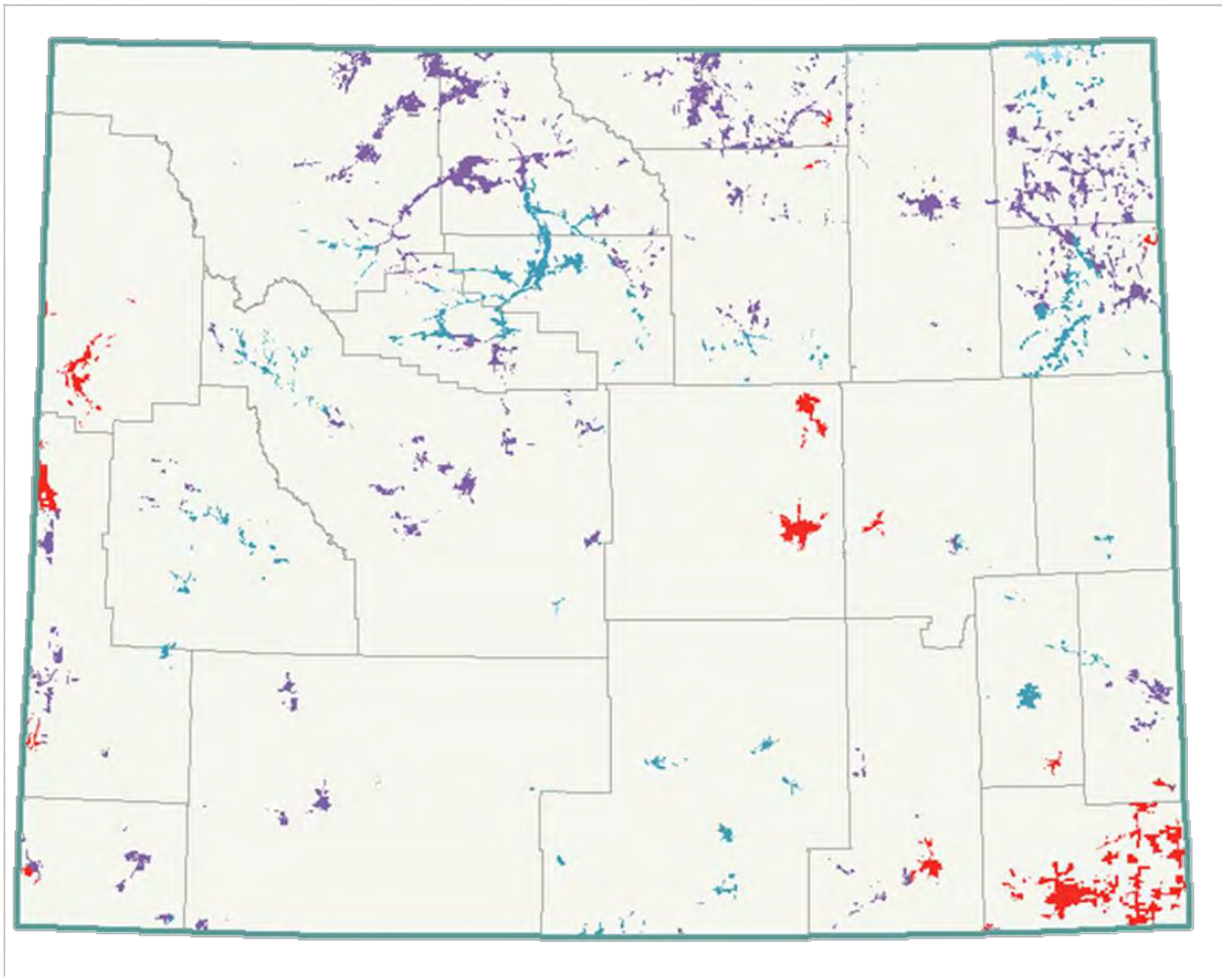
Housing



Industry Asset Intersections

Intersections amongst broadband and workforce. Important, but less critical assets are shown in previous maps.

Intersections shown below, sites within these areas, areas characterized by one or more input assets (e.g. workforce), or intersections amongst sectors may be considered potential business development and innovation zones. More focused analyses will be presented in the report submitted to the Legislature and Governor before December 31st, 2017.



Asset Mapping Conclusions

Professional and Business Services intersections are driven by access to broadband, which exists predominantly in the more-highly populated areas of the state.

Workforce is a significant limitation in many areas in Wyoming. For knowledge-based industries, access to talent is one of the most important factors in considering location, and workforce availability is increasingly driven by livability (The International Economic Development Council, 2017). Out-of-state labor sheds contribute to the Wyoming workforce in some areas along state lines.

Air service is another important enabler to businesses in this sector, and is limited in most areas where other professional and business services requirements are present.

Enablers

- Growing cluster of energy innovators, especially as University of Wyoming

Professional and Business Services
Enablers
No corporate and personal income tax
Wyoming's outdoor lifestyle and livability
Breakthrough 307
Wyoming Technology Business Center
Incentives
Main Street - Technical Assistance Grants
BRC - Business Committed Grants
BRC - Community Enhancement Grants
Challenge Loan
Workforce Training Grants
Challenges
Lack of amenities to attract mellenial talent
Lack of skilled workforce
Availabiltiy of workforce
Cost of housing in some areas of state (Jackson, Laramie, etc.)
Broadband may be a challenge in some parts of Wyoming
Lack of long-term, comprehensive air service solution

Obstacles

See Above

Industry Input

One of the largest obstacles to economic diversity in the state is the lack of available and sustainable air service.

Like other industries/professionals in Wyoming, engineering firms in general have the same problems with recruitment and retainage of young engineers especially if they are not originally from the state of if their spouse is not from the state.

It appears that young people want more amenities in life, such as restaurants, shopping, bike paths, greenbelts etc. The lack of diversity is also an obstacle. Being a female in a STEM field in Wyoming has proved especially difficult due to lack of role models etc. Women in STEM fields in general have difficulty advancing and this is especially true in Wyoming.

Wyoming Water Development Office has worked well with Wyoming firms and utilizes in state talent. Other state agencies should look at the process the WWDC has developed to hire professionals and employ a similar process that supports in-state firms.

-Wyoming Engineering Society

Opportunities

See above, and:

Research and Development

Professional services that are currently performed out of state, e.g. attorneys, accountants

Upstream diversification of resource/energy companies – HQ, research and development (e.g.BP, EOG), Energy Innovation (e.g. LogiLube, Airloom)

Tech

Education and Health Services (61-62)

Summary of Sector

The Education and Health Services sector comprises companies and entities that provide healthcare, social assistance, instruction, or training. This includes physicians' offices, hospitals, dentists, home health services, residential care facilities, public and private schools, universities and colleges, day cares, and other entities. See Appendix 1 for a comprehensive list of NAICS codes in this sector.

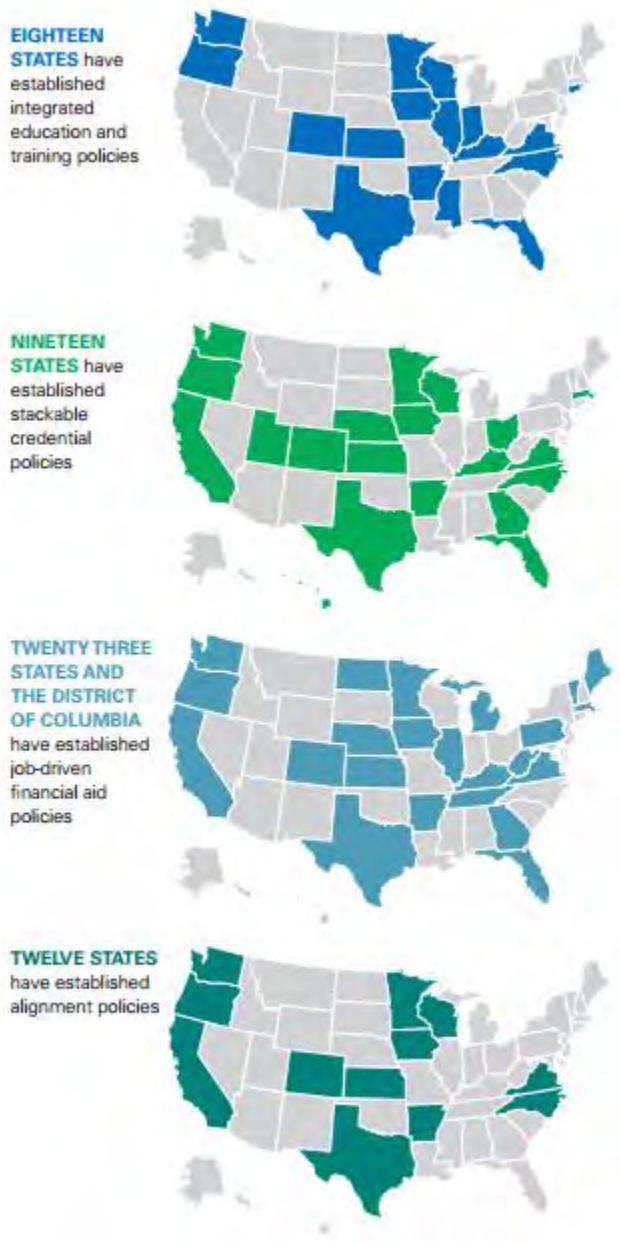
This sector contributes less to Wyoming's economy than it does to comparator states' and the US. Wyoming can grow their economy by $1.37 billion over the next 20 years, by increasing the 4.5% Wyoming GDP contribution to the 8.5% US GDP contribution.

Wyoming wages in this sector are near the average of comparator states.

Barriers in this sector include challenged funding environment for UW and Wyoming schools due to recent drop in commodity production, lack of fast, cost-competitive broadband, and challenged recruitment and retention of workforce, especially physicians. This recruitment and retention is enabled by livability and amenities.

Opportunities in this sector include healthcare, especially telehealth.

For-profit higher education institutes are focused on areas where there are skills gaps, including middle skills jobs. Healthcare is innovating in many areas, including business and financial models, care delivery, and predictive analytics.



Trends

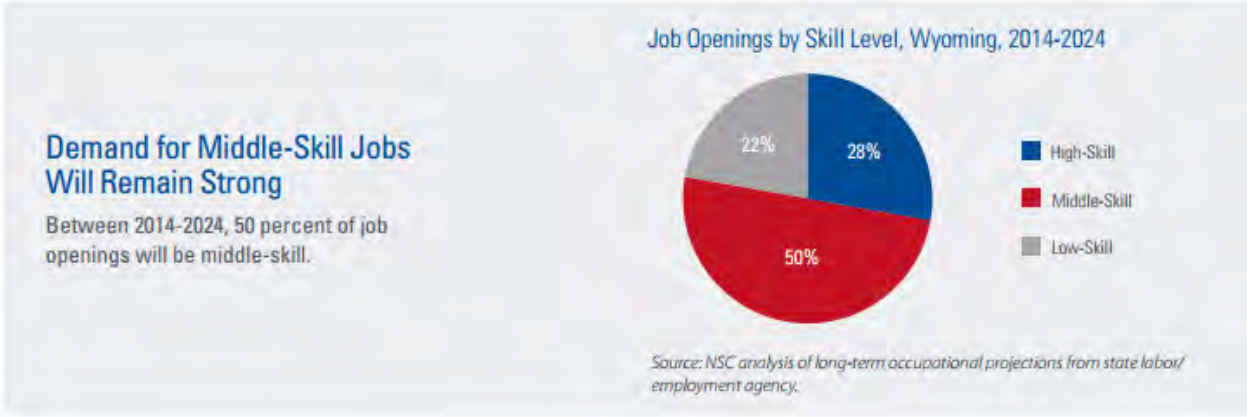
Higher Education (For Profit)

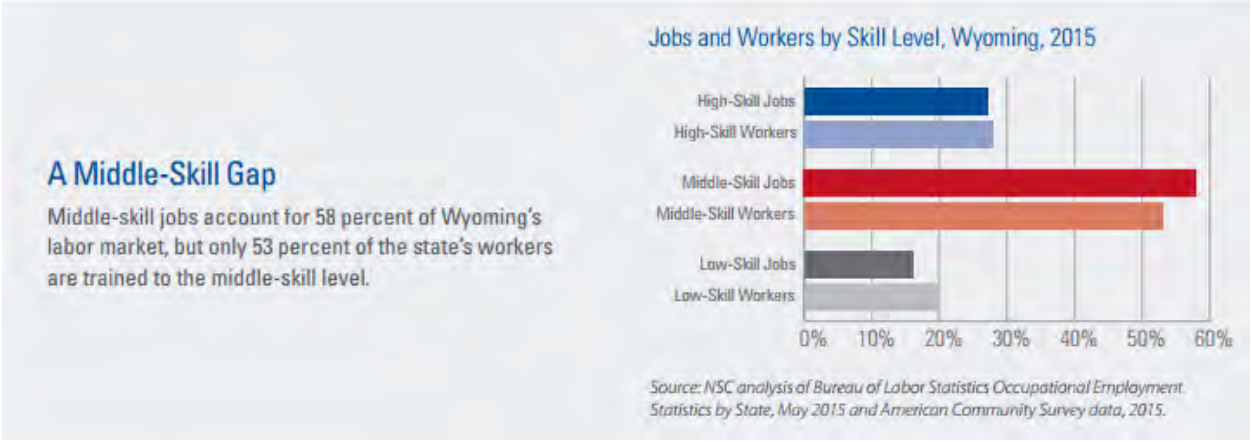
Middle Skills Jobs: the largest workforce gap. These jobs typically require some education and training beyond a high school diploma but less than a bachelor's degree.

Skills and Jobs Mismatch: In nearly every state, the workforce and labor demands are mismatched, with the mismatch most prevalent between the number and type of middle skills jobs available and the number of workers who can fill them. There are more middle skills jobs available than there are middle skills workers. Part of this is determined by geography, but the lack of aligned education options remains at the heart of this mismatch.

Stackable Credentials: App developers, data scientists, and user-experience designers represent just a few of the now essential

professions that didn't exist a short time ago. Given the pace of change, the emergence of entirely new categories of jobs will likely become more common. To keep pace with the ever-quicker cycle of creative destruction, lifelong learning will become a permanent part of our professional lives. This, in turn, is prompting innovators to develop new credentialing infrastructure to support lifelong learning.





College Investment Decision Making: Up to now, college rankings, campus visits, marketing materials, and advice from family, friends, and guidance counselors have served as the main sources of information to guide students' college search. Now, thanks to technology, it's possible for students to employ a more data-driven approach to the college decision-making process. College Abacus, for example, helps students assess financial aid packages across more than 4,000 schools.10 Using College Abacus's net price calculator, students create a cost estimate based on their unique academic and financial information, allowing them to select schools within their budgets.

Sources:

https://www.achieve.org/files/MiddleSkillsJobs.pdf

https://dupress.deloitte.com/dup-us-en/industry/public-sector/reimagining-higher-education.html?id=us:2el:3dc:dup758:eng:fed:dcpromo

WHAT JOBS ARE MIDDLE SKILLS?

"Middle skills jobs" encompass a wide variety of occupations and occupational groups. Often cited are:

- plumbers;
- electricians;
- health care workers/technicians;
- legal assistants;
- machinists; and
- police officers.[12]

Other types of jobs classified as middle skills include:

- firefighters;
- clerical workers;
- engineering technicians; and
- green technology jobs.

Health Care

Operations: Companies are looking at how to transform current operating models to counter rising cost pressures and pursue excellence across their organizations. This includes streamlining processes and improving policy compliance with a focus on reducing administration and operational costs. Companies are taking multiple paths to achieve quality, cost, and efficiency goals such as collaborative product development; portfolio/operational restructuring; growth through mergers/acquisitions and talent transformation.

Care Delivery: Engaged and empowered consumers are demanding services and solutions that are coordinated, convenient, customized, and accessible. This trend is driven by patients' ability to change their own outcomes based on behavior; financial scrutiny due to cost-sharing models that push more costs onto the patient; the industry's shift towards evaluating outcomes to determine value delivered to the patient; and the availability of technology solutions providing patients with more information and ways to communicate (i.e. social media and networks); and the ability to play an active role in managing their well-being. The increase in data/information access, mobile applications, and personal health devices is accelerating the pace of consumer engagement. Large pharmaceutical companies focused on traditional markets have lagged in responding to changing industry focus towards holistic patient management.

Cost: The pressure to reduce costs and prove value in life sciences is intense. Uneven regional economic growth, reduced government health care spending, and increasing consumer out-of-pocket costs for popular treatments are underpinning demands for lower-cost drugs/devices; greater use of generics; value- and outcome-based payment models; and more stringent regulatory processes. Increasingly, companies are expected to justify the cost of their products using improved targeting, comparative effectiveness measures, and real-world evidence in addition to hard clinical endpoints. Adding to the pressure, the costs of bringing a new medicine to market have never been higher – and they continue to rise while drug price cost-containment measures or value-based pricing and reimbursement models continue to rise.

Innovation: Driving and sustaining clinical innovation persists; competition and patent cliffs continue to jeopardize revenue. Soaring R&D costs, pricing pressures, growing share for generic pharmaceuticals and biosimilars, and heightened scrutiny by regulators are having a dampening effect on clinical innovation. And even though health systems report substantial improvements in outcomes, the demand for innovative treatments is unrelenting, driven by the proliferation of age-related diseases such as cancer and dementia, and lifestyle-influenced or behavior-related chronic diseases, such as obesity and diabetes.

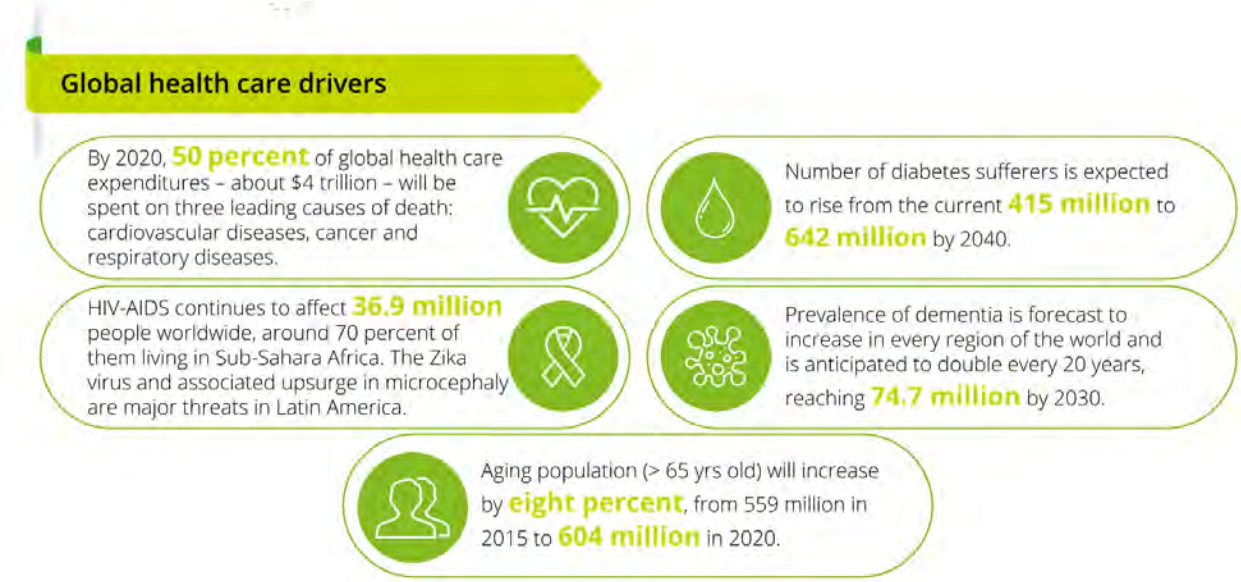
Regulation: The sector operates in one of the world's most regulated environments. Companies face particular compliance challenges as they seek to push the boundaries of innovation, developing and launching new products which address unmet patient needs but for which there is often little or no regulation. In 2017, organizations of all sizes will need to deal with a highly complex, changing set of global, regional, country, and industry-specific laws and directives that span a drug or device's developmental and commercial lifecycle. Primary regulatory focus areas include cybersecurity, drug and device safety, counterfeit drugs, intellectual property protection, and corruption.

Assisted Living and Residential Care: As life expectancy has continued to increase alongside chronic illness rates, demand for retirement communities, assisted living and nursing home facilities providing care also increases.

Sources:

https://www2.deloitte.com/us/en/pages/life-sciences-and-health-care/articles/global-life-sciences-sector-outlook.html

https://www2.deloitte.com/content/dam/Deloitte/es/Documents/sanidad/Deloitte_ES_Sanidad_Better-care-for-frail-older-people.pdf



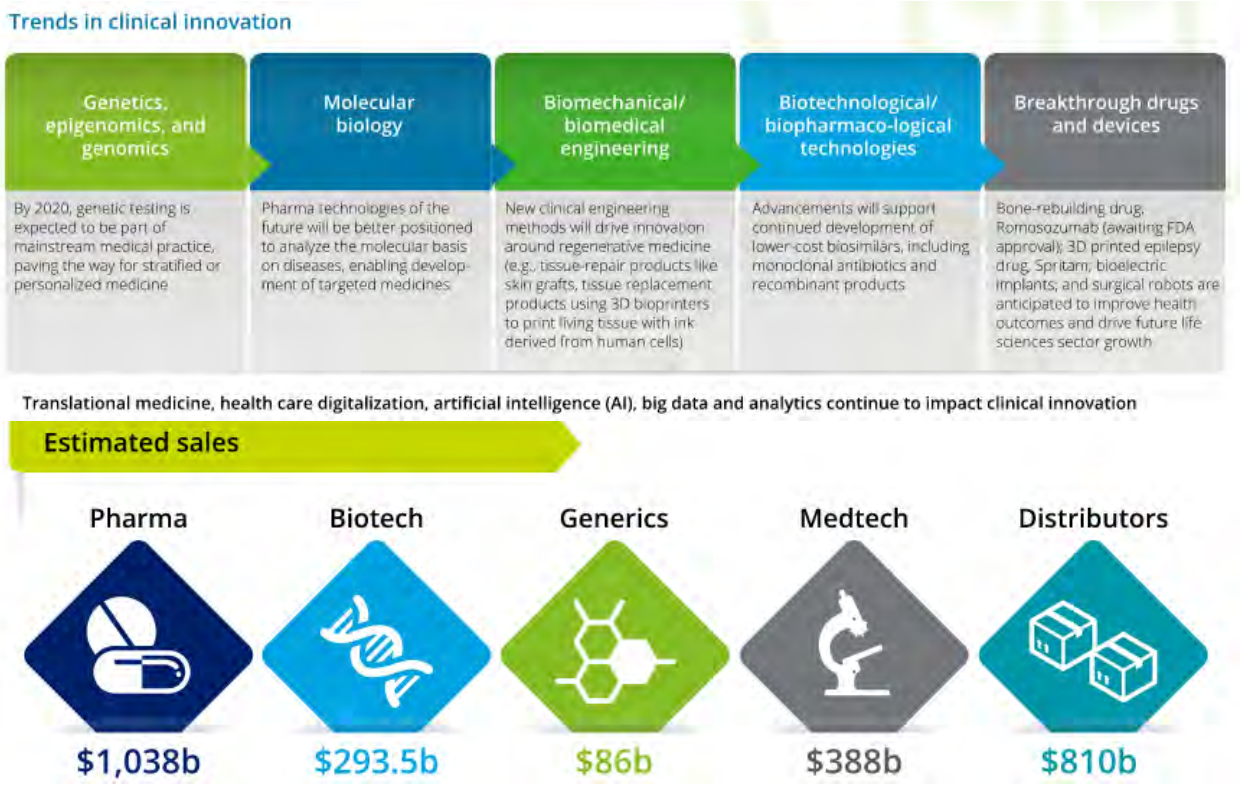
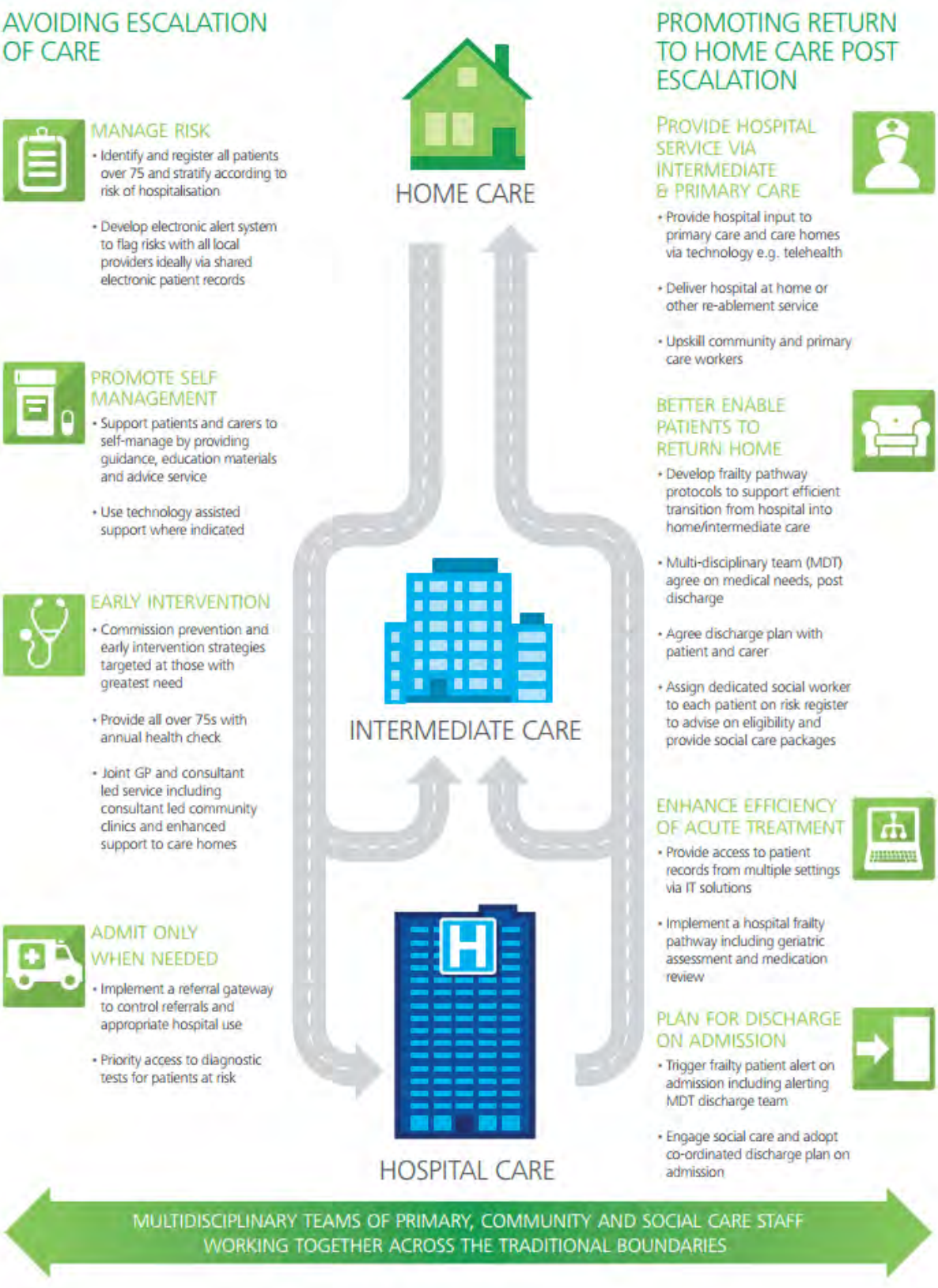


Figure 1. An integrated model of care for frail older people



Social Assistance

Sub Categories: Child/Day Care, Vocational Rehab, Community Food/Housing, Individual/Family Services.

Non Traditional Partnerships: Recognizing the need to maximize resource use and offer fresh ideas, some human services organizations are breaking through longstanding barriers and exploring nontraditional partnerships with each other—both nonprofits and the private sector. The result is a new human services ecosystem where organizations forge interactive and interdependent relationships that are mutually beneficial and directed toward a common goal.

Creative Financing Models: Pay-for-success contracts are gaining traction as an alternative funding mechanism for human services programs that pays providers of goods or services when outcomes are met. These arrangements take on a variety of forms, and social financing is one of them. The basic principle is to encourage outside investment in preventive social interventions that ultimately benefit the common good—and reduce the need for costly future remediation for which taxpayers will have to pay.

Predictive Analytics: Descriptive and predictive analytics are at the heart of the information boon as organizations work to make data insight actionable. Human services agencies using analytics today are most often using descriptive analytics for simple reporting or to detect and correct non-compliance after transactions are completed. The more exciting promise of analytics lies in a more proactive application. Predictive analytics can increase understanding of the relative effectiveness of different programs so that interventions—and resources—can be smartly targeted for better outcomes.

Leading Practices: As other human services agencies begin to explore such "outsider" practices, what's business-as-usual in other industries may increasingly define the new face of human services delivery.

Wrap Around Care: Serving the whole individual, a tenet of human services transformation, is impossible without health and human services integration—from strategic vision through tactical implementation. A 2012 Human Services Summit attendee explained the vision, "The challenge is sustaining a long term strategy to be able to view our customers from eligibility determination through delivery of services and assess health outcomes of the overall populations."

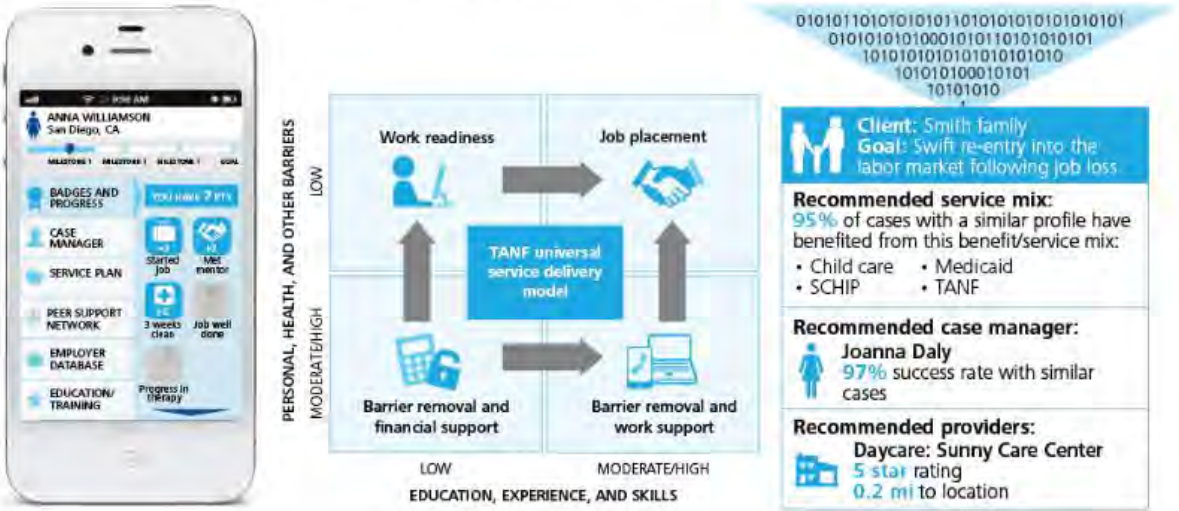
Different Needs, Different Paths: Henry Ford's use of assembly line manufacturing and interchangeable parts helped make the Model T affordable to the common man. While human services organizations share common ground around the need for change, the paths to change are varied. Different organizations will be ripe for different trends. Some jurisdictions are already rich in an entrepreneurial atmosphere, while others may need legislative action as a first step to incubating change.

http://siccode.com/en/naicscodes/624/social-assistance

http://www.govtech.com/health/5-Trends-Driving-the-Future-of-Human-Services.html

https://dupress.deloitte.com/dup-us-en/industry/public-sector/human-services-delivery-data-driven-insights.html

Figure 1. Three principles for moving from a transactional business model to a transformational one



PRINCIPLE 1

Accelerate the value of self-service through automation

Use technology, smart product design, and automated processes to redesign the "front door" for human services, making it a customized entrance that combines the information that clients input themselves with behind-the-scenes automation not just to determine eligibility, but also to offer clients a truly personalized path to greater self-sufficiency.

PRINCIPLE 2

Redesign programs to serve unique customer segments

Rethink the design and delivery of programs to take into account the diverse spectrum of clients human services serves, delivering tailored services that better meet the needs of different customer segments.

PRINCIPLE 3

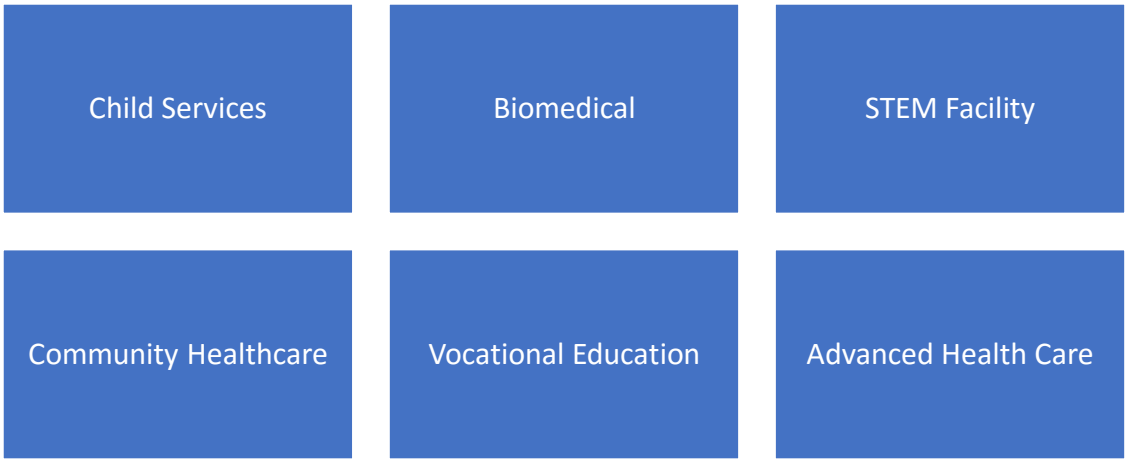
Transform practice through analytics

Use analytics to transform the entire human services delivery cycle, from how agencies define and target problems and how they use data to inform how case workers approach their day-to-day work, to how they challenge long-standing beliefs about what works and then use what they learn to reform their policies and practice.

Graphic: Deloitte University Press | DUPress.com

Industry Focus Around the State

Communities around the state have identified the following specific focus industries within the healthcare sector. This data was collected using the ENDOW Regional Assessment.

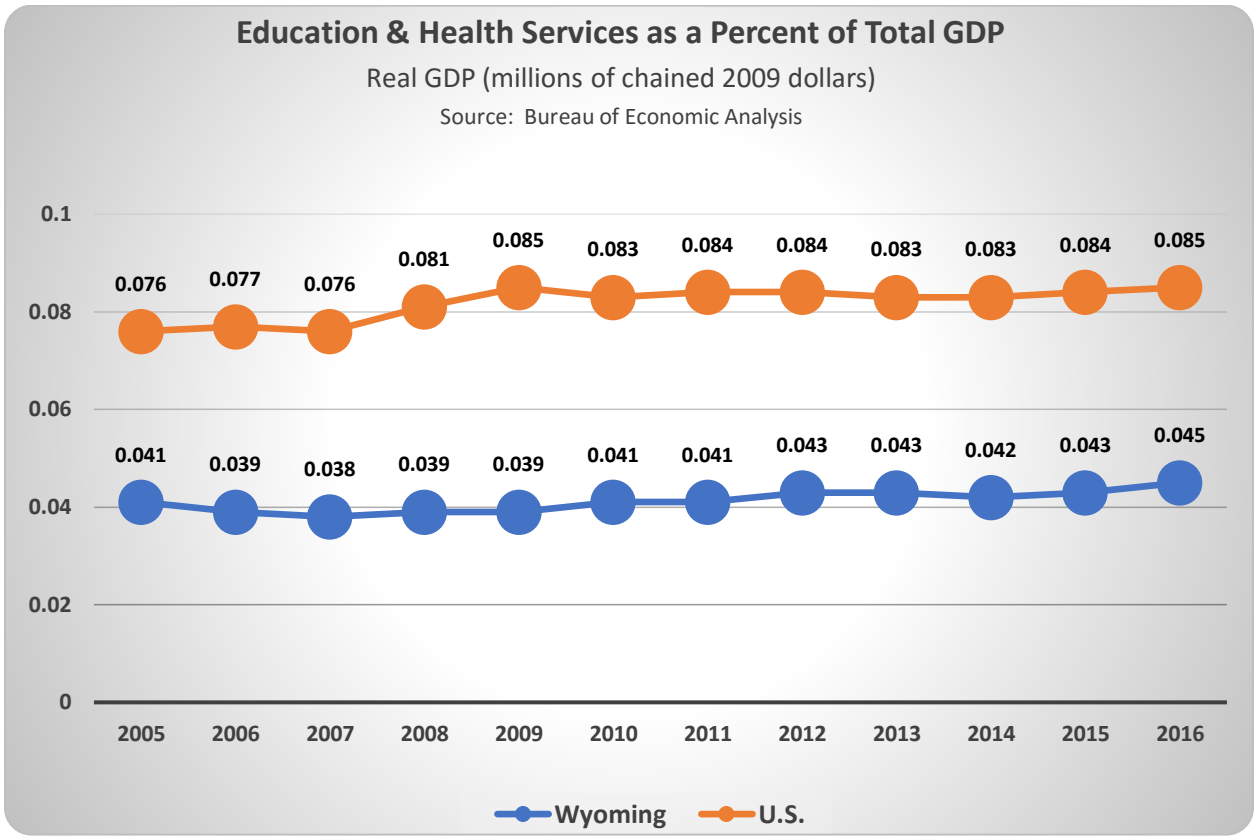


How does Wyoming compare?

WY Education and Health Services as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	**Total GDP**	**Education and Health Services**	**% of Total GDP**
2005	$29,637	$1,223	4.1%
2010	$36,469	$1,487	4.1%
2016	$34,439	$1,551	4.5%

U.S. Education and Health Services as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	**Total GDP**	**Education and Health Services**	**% of Total GDP**
2005	$14,203,241	$1,075,854	7.6%
2010	$14,628,165	$1,220,547	8.3%
2016	$16,342,925	$1,387,700	8.5%

Source: Bureau of Economic Analysis



Over the next 20 years, if Wyoming increases the 4.5% Education and Health Services GDP to equal the 8.5% GDP of the US, that 4% increase would equate to $1.37 billion dollars.

Wyoming and United States Education and Health Services Sector GDP

Real GDP (millions of chained 2009 dollars)

	2005				2010			
Industry	WY		U.S.		WY		U.S.	
Education and Health Services	**GDP**	**% GDP**	**GDP**	**% GDP**	**GDP**	**% GDP**	**GDP**	**% GDP**
Educational Services	$ 65	5.3%	$ 143,072	13.3%	$ 81	5.4%	$ 164,815	13.5%
Ambulatory Health Care Services	$ 614	50.2%	$ 441,308	41.0%	$ 770	51.8%	$ 505,043	41.4%
Hospitals and Nursing and Residential Care Facilities	$ 370	30.25%	$ 409,858	38.10%	$ 422	28.38%	$ 461,157	37.78%

	2015			
Industry	WY		U.S.	
Education and Health Services	**GDP**	**% GDP**	**GDP**	**% GDP**
Educational Services	$ 70	4.6%	$ 167,999	12.4%
Ambulatory Health Care Services	$ 858	56.2%	$ 595,190	43.9%
Hospitals and Nursing and Residential Care Facilities	$ 402	26.33%	$ 493,752	36.45%

States with the Highest and Lowest Shares of Education and Health Services, 2016

(as a percentage of their GDP)

Top Five States

Maine	13.2%
Vermont	13.1%
Rhode Island	12.9%
Massachusetts	12.0%
Pennsylvania	11.4%

Bottom Five States

Colorado	7.0%
Washington	6.9%
Nevada	6.6%
Texas	6.3%
Wyoming	4.5%

In 2016, Wyoming ranked 50th in the nation at 4.5%

Education and Health Services play a significant role in our national economy, accounting for roughly 8.5 percent of the United States GDP. Wyoming would rank 27th in the nation for Education and Health Services if we grow our GDP to 8.5 percent.

Percentage Education and Health Services Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Education and Health Services GDP	% of Total GDP
Wyoming	$1,551	4.5%
Alaska	$3,410	7.2%
Colorado	$20,610	7.0%
Idaho	$5,285	8.9%
Montana	$4,119	10.0%
New Mexico	$6,753	7.8%
North Dakota	$3,552	7.5%
South Dakota	$4,163	10.0%
Utah	$9,689	7.1%
United States	$1,387,700	8.5%

Source: Bureau of Economic Analysis

Percentage Education and Health Services Contributes to Total Employment

2016

	Education and Health Services GDP	% of Total Employment
Wyoming	26,470	9.7%
Alaska	47,675	14.6%
Colorado	322,438	12.6%
Idaho	94,731	13.8%
Montana	71,379	15.7%
New Mexico	127,157	15.8%
North Dakota	60,860	14.6%
South Dakota	65,247	15.5%
Utah	174,701	12.6%
United States	21,651,890	15.3%

Source: Bureau of Labor Statistics

Wyoming and United States Education and Health Services Sector Establishments								
	2005				2010			
Industry	WY		U.S.		WY		U.S.	
Education and Health Services	#	% of Total Education and Health Services	#	% of Total Education and Health Services	#	% of Total Education and Health Services	#	% of Total Education and Health Services
Educational Services	147	8.7%	78,410	10.2%	193	9.5%	93,570	10.5%
Ambulatory Health Care Services	1,015	59.7%	485,953	63.3%	1,174	57.9%	539,217	60.6%
Hospitals	15	0.9%	7,511	1.0%	12	0.6%	8,013	0.9%
Nursing and Residential Care Facilities	100	5.9%	64,251	8.4%	106	5.2%	69,996	7.9%
Social Assistance	422	24.8%	131,295	17.1%	542	26.8%	179,095	20.1%

.	2016			
Industry	WY		U.S.	
Education and Health Services	#	% of Total Education and Health Services	#	% of Total Education and Health Services
Educational Services	238	7.6%	114,361	7.2%
Ambulatory Health Care Services	1296	41.3%	585,189	36.7%
Hospitals	17	0.5%	9,594	0.6%
Nursing and Residential Care Facilities	113	3.6%	77,963	4.9%
Social Assistance	1473	46.9%	807,981	50.7%

Businesses in the Sector

Firms in Wyoming	
Total Firms	3,672
Average Age	9
Number Firms Under 5 Years Old	1,918
Number Firms 5-9 Years Old	671
Number Firms over 10 Years Old	1,083

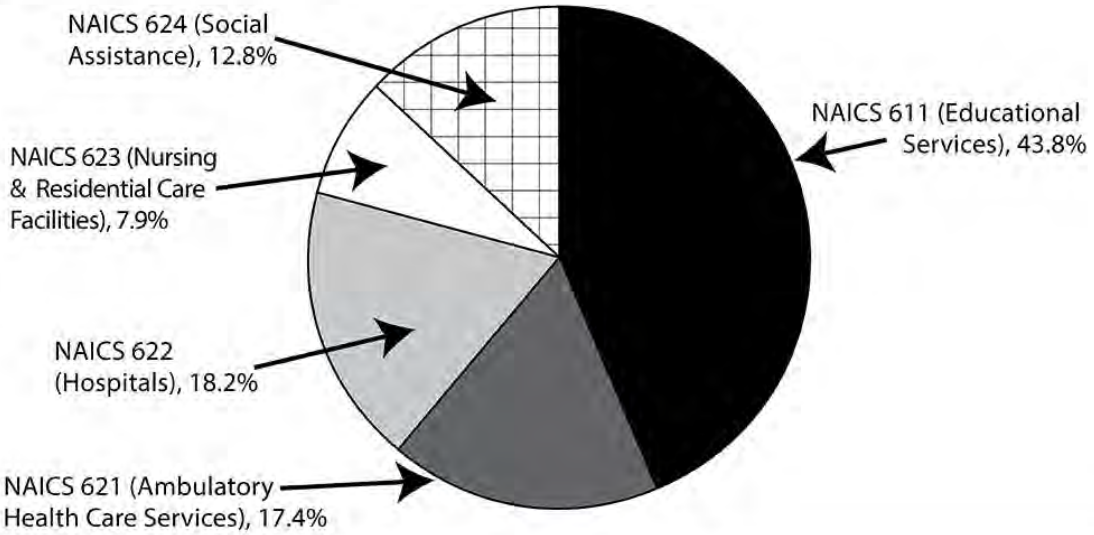
Wyoming and United States Firms, Employees and Annual Wage (2016)

		Wyoming			United States		
NAICS Code	Industry	Firms	Employees	Annual Wages	Firms	Employees	Annual Wages
61-62	Educational Services, Health Care, and Social Assistance	3,303	57,315	44,327	1,662,407	30,022,568	47,609
611	Educational services	386	25,077	41,386	180,310	10,478,213	46,286
621	Ambulatory health care services	1,296	9,964	58,426	585,189	7,055,847	59,875
622	Hospitals	34	10,416	59,278	10,965	5,600,594	60,717
623	Nursing and residential care facilities	113	4,530	31,084	77,963	3,308,531	30,266
624	Social assistance	1,473	7,329	22,136	807,981	3,579,384	22,823

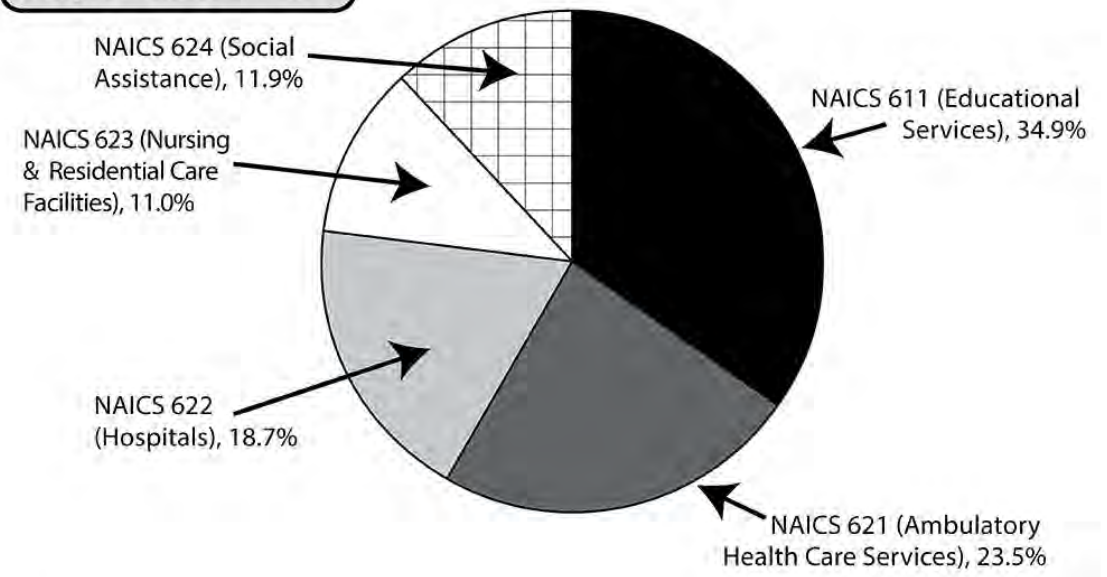
NAICS[a] 61-62: Educational Services, Health Care, & Social Assistance

Distribution of Jobs by 3-Digit NAICS Code in Wyoming and the U.S., 2016 Annual Average

Wyoming, N = 57,315



U.S., N = 30.0 Million



[a]North American Industry Classification System.
Source: Quarterly Census of Employment and Wages. U.S. Bureau of Labor Statistics.
Prepared by T. Glover and M. Moore, Research & Planning, WY DWS, 7/21/17.

Workforce

Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	2,177	57,438	$36,817
Colorado	2005	14,282	349,700	$36,412
Idaho	2005	5,255	109,547	$29,519
Montana	2005	3,860	81,798	$30,221
New Mexico	2005	4,919	148,221	$31,549
North Dakota	2005	1,904	66,423	$31,145
South Dakota	2005	2,492	77,254	$31,435
Utah	2005	7,698	174,924	$30,956
Wyoming	2005	1,863	46,940	$32,028
US	2005	828,077	24,745,061	$37,228

State	Year	Firms	Employees	Annual Wage
Alaska	2010	2,358	63,156	$42,551
Colorado	2010	16,264	400,463	$41,872
Idaho	2010	6,034	125,856	$33,394
Montana	2010	4,317	89,623	$36,253
New Mexico	2010	6,812	164,195	$36,706
North Dakota	2010	2,117	73,339	$37,804
South Dakota	2010	2,758	84,805	$37,045
Utah	2010	8,807	204,888	$35,637
Wyoming	2010	2,199	54,045	$40,254
US	2010	953,864	27,097,417	$43,099

State	Year	Firms	Employees	Annual Wage
Alaska	2016	2,643	69,972	$49,562
Colorado	2016	20,159	468,201	$45,903
Idaho	2016	7,633	142,204	$38,002
Montana	2016	4,723	97,155	$42,839
New Mexico	2016	9,683	177,149	$39,241
North Dakota	2016	2,645	83,162	$47,035
South Dakota	2016	2,916	91,052	$44,259
Utah	2016	12,382	244,147	$39,391
Wyoming	2016	3,303	57,315	$44,331
US	2016	1,662,407	30,022,568	$47,609

Occupations in Education Services, Health Care and Social Services

Title	Mean Hourly	Mean Annual	Median Hourly	Median Annual
Total all occupations	$24	$49,597	$19	$40,299
Management Occupations	$44	$92,439	$41	$86,117
Top Executives	$51	$106,389	$47	$96,764
Chief Executives	$77	$159,963	$74	$154,102
General and Operations Managers	$47	$97,703	$44	$90,570
Advertising, Marketing, Promotions, Public Relations, and Sales Managers	$53	$109,278	$54	$111,392
Marketing Managers	$55	$114,597	$56	$116,659
Operations Specialties Managers	$46	$96,613	$44	$92,553
Administrative Services Managers	$43	$88,841	$42	$87,749
Computer and Information Systems Managers	$44	$92,469	$43	$88,925
Financial Managers	$52	$108,449	$50	$103,531
Human Resources Managers	$45	$93,194	$44	$92,177
Other Management Occupations	$41	$85,989	$39	$81,321
Education Administrators, Preschool and Childcare Center/Program	$24	$49,076	$23	$48,581
Education Administrators, Elementary and Secondary School	NULL	$93,710	NULL	$93,980
Education Administrators, Postsecondary	$51	$106,721	$47	$97,242
Education Administrators, All Other	$42	$88,224	$44	$91,288
Food Service Managers	$34	$69,968	$32	$67,127
Medical and Health Services Managers	$47	$98,482	$44	$90,857
Social and Community Service Managers	$28	$57,904	$25	$51,312
Managers, All Other	$41	$85,549	$36	$75,242
Business and Financial Operations Occupations	$28	$58,667	$26	$55,057
Business Operations Specialists	$28	$57,819	$25	$52,828
Purchasing Agents, Except Wholesale, Retail, and Farm Products	$22	$46,575	$22	$46,114
Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	$42	$86,555	$38	$80,033
Human Resources Specialists	$25	$52,025	$23	$48,441
Meeting, Convention, and Event Planners	$21	$42,681	$20	$40,831
Training and Development Specialists	$32	$67,234	$30	$61,815
Market Research Analysts and Marketing Specialists	$25	$52,841	$24	$49,936
Business Operations Specialists, All Other	$32	$66,816	$29	$61,321
Financial Specialists	$29	$60,534	$28	$58,396
Accountants and Auditors	$29	$60,990	$28	$58,809
Budget Analysts	$35	$73,144	$34	$69,743
Credit Counselors	$20	$41,872	$21	$43,291
Financial Specialists, All Other	$23	$47,524	$24	$49,056
Computer and Mathematical Occupations	$28	$57,865	$28	$57,257
Computer Specialists	$28	$57,896	$28	$57,354
Computer Programmers	$28	$57,791	$28	$58,303
Web Developers	$23	$47,531	$23	$48,241

Database Administrators	$35	$73,359	$35	$73,123
Network and Computer Systems Administrators	$32	$67,121	$32	$67,282
Computer User Support Specialists	$23	$47,325	$23	$47,006
Computer Network Support Specialists	$24	$50,068	$24	$49,207
Life, Physical, and Social Science Occupations	$30	$63,106	$28	$58,651
Social Scientists and Related Workers	$34	$69,881	$32	$66,403
Clinical, Counseling, and School Psychologists	$34	$71,655	$32	$67,540
Community and Social Services Occupations	$22	$46,723	$22	$44,929
Counselors, Social Workers, and Other Community and Social Service Specialists	$22	$46,716	$22	$44,856
Substance Abuse and Behavioral Disorder Counselors	$23	$48,178	$23	$47,407
Educational, Guidance, School, and Vocational Counselors	$26	$54,671	$26	$54,171
Marriage and Family Therapists	$29	$59,399	$28	$57,209
Mental Health Counselors	$28	$58,167	$27	$55,474
Rehabilitation Counselors	$16	$33,484	$15	$31,359
Child, Family, and School Social Workers	$22	$46,070	$22	$45,505
Healthcare Social Workers	$25	$50,984	$25	$52,204
Mental Health and Substance Abuse Social Workers	$27	$56,281	$27	$55,486
Social Workers, All Other	$22	$46,567	$22	$46,301
Health Educators	$28	$57,913	$28	$58,248
Social and Human Service Assistants	$15	$31,200	$14	$29,011
Community Health Workers	$21	$42,904	$16	$33,122
Community and Social Service Specialists, All Other	$21	$43,681	$18	$38,128
Religious Workers	$23	$47,633	$23	$47,974
Clergy	$23	$47,905	$23	$48,640
Education, Training, and Library Occupations	$23	$48,748	$23	$48,230
Postsecondary Teachers	$32	$65,948	$30	$61,620
Business Teachers, Postsecondary	NULL	$77,938	NULL	$68,034
Computer Science Teachers, Postsecondary	NULL	$72,620	NULL	$71,531
Mathematical Science Teachers, Postsecondary	NULL	$60,379	NULL	$54,604
Engineering Teachers, Postsecondary	NULL	$96,820	NULL	$91,357
Agricultural Sciences Teachers, Postsecondary	NULL	$77,774	NULL	$76,178
Biological Science Teachers, Postsecondary	NULL	$78,129	NULL	$74,197
Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	NULL	$90,601	NULL	$86,236
Chemistry Teachers, Postsecondary	NULL	$79,231	NULL	$73,190
Physics Teachers, Postsecondary	NULL	$75,257	NULL	$73,918
Anthropology and Archeology Teachers, Postsecondary	NULL	$74,516	NULL	$75,772
Area, Ethnic, and Cultural Studies Teachers, Postsecondary	NULL	$65,310	NULL	$63,821
Economics Teachers, Postsecondary	NULL	$109,363	NULL	$101,604
Political Science Teachers, Postsecondary	NULL	$64,228	NULL	$64,686
Psychology Teachers, Postsecondary	NULL	$67,800	NULL	$64,280
Sociology Teachers, Postsecondary	NULL	$74,007	NULL	$70,299
Health Specialties Teachers, Postsecondary	NULL	$71,092	NULL	$67,925
Nursing Instructors and Teachers, Postsecondary	NULL	$66,543	NULL	$66,003

Education Teachers, Postsecondary	NULL	$64,600	NULL	$62,806
Criminal Justice and Law Enforcement Teachers, Postsecondary	NULL	$63,990	NULL	$61,678
Law Teachers, Postsecondary	NULL	$125,120	NULL	$120,765
Social Work Teachers, Postsecondary	NULL	$79,030	NULL	$72,963
Art, Drama, and Music Teachers, Postsecondary	NULL	$59,417	NULL	$59,358
Communications Teachers, Postsecondary	NULL	$63,363	NULL	$60,981
English Language and Literature Teachers, Postsecondary	NULL	$59,774	NULL	$58,393
Foreign Language and Literature Teachers, Postsecondary	NULL	$46,358	NULL	$46,722
History Teachers, Postsecondary	NULL	$60,338	NULL	$61,461
Philosophy and Religion Teachers, Postsecondary	NULL	$74,357	NULL	$73,826
Recreation and Fitness Studies Teachers, Postsecondary	NULL	$58,762	NULL	$58,064
Vocational Education Teachers, Postsecondary	$25	$52,040	$23	$48,295
Postsecondary Teachers, All Other	NULL	$52,229	NULL	$47,823
Primary, Secondary, and Special Education School Teachers	$27	$57,159	$27	$56,377
Preschool Teachers, Except Special Education	$15	$31,762	$15	$30,580
Kindergarten Teachers, Except Special Education	NULL	$57,605	NULL	$56,779
Elementary School Teachers, Except Special Education	NULL	$58,856	NULL	$57,765
Middle School Teachers, Except Special and Career/Technical Educa	NULL	$59,702	NULL	$58,876
Career/Technical Education Teachers, Middle School	NULL	$60,687	NULL	$61,251
Secondary School Teachers, Except Special and Career/Technical Ed	NULL	$58,824	NULL	$58,274
Career/Technical Education Teachers, Secondary School	NULL	$59,047	NULL	$58,186
Special Education Teachers, Preschool	NULL	$48,422	NULL	$47,552
Special Education Teachers, Kindergarten and Elementary School	NULL	$58,765	NULL	$58,468
Special Education Teachers, Middle School	NULL	$58,690	NULL	$58,292
Special Education Teachers, Secondary School	NULL	$57,837	NULL	$57,871
Other Teachers and Instructors	$15	$30,207	$14	$29,103
Adult Basic and Secondary Education and Literacy Teachers and Ins	$22	$46,577	$22	$46,086
Self-Enrichment Education Teachers	$19	$39,201	$18	$36,701
Teachers and Instructors, All Other, Except Substitute Teachers	NULL	$43,105	NULL	$34,877
Substitute Teachers	$14	$28,532	$14	$28,764
Librarians, Curators, and Archivists	$23	$47,741	$22	$44,911
Librarians	$27	$56,886	$28	$58,025
Library Technicians	$16	$33,849	$16	$33,221
Other Education, Training, and Library Occupations	$16	$33,000	$14	$29,859
Audio-Visual and Multimedia Collections Specialists	$26	$53,850	$26	$54,592
Instructional Coordinators	$32	$66,508	$33	$67,795
Teacher Assistants	NULL	$28,930	NULL	$28,738
Education, Training, and Library Workers, All Other	$19	$39,568	$19	$38,949
Arts, Design, Entertainment, Sports, and Media Occupations	$19	$39,102	$16	$34,029
Art and Design Workers	$18	$37,826	$17	$35,859
Graphic Designers	$18	$37,312	$17	$35,317
Entertainers and Performers, Sports and Related Workers	$18	$36,576	$13	$27,426
Coaches and Scouts	NULL	$35,745	NULL	$21,327

Choreographers	$17	$36,107	$17	$34,799
Music Directors and Composers	$29	$61,146	$29	$60,519
Media and Communication Workers	$24	$49,517	$23	$48,360
Public Relations Specialists	$25	$51,525	$24	$49,687
Interpreters and Translators	$22	$45,870	$22	$46,082
Media and Communication Equipment Workers	$22	$45,431	$22	$45,659
Audio and Video Equipment Technicians	$21	$42,817	$20	$40,759
Broadcast Technicians	$26	$53,134	$27	$55,253
Healthcare Practitioners and Technical Occupations	$39	$80,659	$30	$61,800
Health Diagnosing and Treating Practitioners	$46	$95,937	$34	$69,797
Chiropractors	$31	$64,650	$27	$55,744
Dentists, General	$84	$175,349	$73	$152,194
Dietitians and Nutritionists	$29	$60,818	$29	$60,540
Optometrists	$60	$124,609	$45	$94,071
Pharmacists	$54	$112,527	$57	$117,650
Anesthesiologists	$104	$216,057	$96	$199,613
Family and General Practitioners	95	197073	92	191316
Internists, General	116	241685	NULL	NULL
Obstetricians and Gynecologists	120	248708	NULL	NULL
Pediatricians, General	100	208371	84	173837
Psychiatrists	121	251066	NULL	NULL
Surgeons	142	296202	NULL	NULL
Physicians and Surgeons, All Other	129	267751	NULL	NULL
Physician Assistants	53	110709	51	106593
Occupational Therapists	36	74206	35	72242
Physical Therapists	40	82462	38	78449
Radiation Therapists	39	80734	37	77623
Recreational Therapists	21	43577	22	45349
Respiratory Therapists	28	57239	28	57621
Speech-Language Pathologists	34	71402	33	68467
Exercise Physiologists	23	47469	22	46017
Registered Nurses	30	62080	29	60916
Nurse Anesthetists	115	239604	NULL	NULL
Nurse Practitioners	55	113596	50	104246
Audiologists	46	95673	49	101617
Health Technologists and Technicians	23	48065	22	45319
Medical and Clinical Laboratory Technologists	29	60706	29	61008
Medical and Clinical Laboratory Technicians	19	39972	18	37154
Dental Hygienists	33	68867	33	69631
Cardiovascular Technologists and Technicians	25	52297	23	47128
Diagnostic Medical Sonographers	32	66066	31	63628
Nuclear Medicine Technologists	34	70370	34	70969
Radiologic Technologists and Technicians	27	55681	26	53706
Magnetic Resonance Imaging Technologists	32	66960	31	64889
Emergency Medical Technicians and Paramedics	17	34383	17	34570

Pharmacy Technicians	18	37221	18	36979
Surgical Technologists	21	44554	21	43122
Ophthalmic Medical Technicians	17	34934	15	31855
Licensed Practical and Licensed Vocational Nurses	22	45504	22	45544
Medical Records and Health Information Technicians	19	39078	18	36663
Opticians, Dispensing	16	32644	15	31854
Health Technologists and Technicians, All Other	21	42653	18	37828
Other Healthcare Practitioners and Technical Occupations	28	58362	27	55119
Athletic Trainers	NULL	48387	NULL	43946
Healthcare Support Occupations	15	31040	14	29296
Nursing, Psychiatric, and Home Health Aides	13	27903	13	27542
Home Health Aides	13	26649	13	27460
Psychiatric Aides	13	26076	12	24751
Nursing Assistants	14	28373	13	27719
Orderlies	14	29851	12	24867
Occupational and Physical Therapist Assistants and Aides	20	41722	21	42651
Occupational Therapy Assistants	26	53763	25	52135
Physical Therapist Assistants	25	51490	24	50204
Physical Therapist Aides	13	26369	12	24361
Other Healthcare Support Occupations	17	34707	16	33777
Massage Therapists	25	51649	24	48875
Dental Assistants	17	34621	17	34423
Medical Assistants	16	32610	15	31703
Medical Equipment Preparers	17	36228	17	35326
Medical Transcriptionists	18	38089	18	37525
Phlebotomists	15	32194	15	31384
Healthcare Support Workers, All Other	20	40642	19	40036
Protective Service Occupations	15	31391	15	30348
Other Protective Service Workers	15	30493	14	29993
Security Guards	16	33778	16	32508
Crossing Guards	11	23418	9	19454
Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	12	24083	10	20898
Protective Service Workers, All Other	15	30212	14	29979
Food Preparation and Serving-Related Occupations	14	28146	13	26798
Supervisors, Food Preparation and Serving Workers	19	40252	18	38276
First-Line Supervisors of Food Preparation and Serving Workers	19	40017	18	38188
Cooks and Food Preparation Workers	13	27036	13	26297
Cooks, Institution and Cafeteria	13	28032	13	27826
Food Preparation Workers	12	24640	12	24625
Food and Beverage Serving Workers	13	26579	13	26431
Combined Food Preparation and Serving Workers, Including Fast Food	12	25772	12	25947
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	15	30430	14	30049
Food Servers, Nonrestaurant	11	23002	11	22348

Other Food Preparation and Serving Related Workers	11	23465	11	22902
Dishwashers	11	23902	11	22850
Building and Grounds Cleaning and Maintenance Occupations	15	30649	14	29779
Supervisors, Building and Grounds Cleaning and Maintenance Workers	22	44847	21	43344
First-Line Supervisors of Housekeeping and Janitorial Workers	21	44707	21	43163
First-Line Supervisors of Landscaping, Lawn Service, and Groundsk	22	45904	21	44355
Building Cleaning and Pest Control Workers	14	29202	14	28767
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	14	30126	14	29603
Maids and Housekeeping Cleaners	12	25212	12	24851
Grounds Maintenance Workers	15	31644	14	29629
Landscaping and Groundskeeping Workers	15	31644	14	29629
Personal Care and Service Occupations	12	24240	11	23069
Supervisors, Personal Care and Service Workers	16	32540	15	30641
First-Line Supervisors of Personal Service Workers	16	32540	15	30641
Entertainment Attendants and Related Workers	12	24950	11	22573
Amusement and Recreation Attendants	12	24950	11	22573
Other Personal Care and Service Workers	11	23686	11	22819
Childcare Workers	11	23412	11	22582
Personal Care Aides	11	22938	11	22459
Fitness Trainers and Aerobics Instructors	16	33028	13	26330
Recreation Workers	13	28051	13	27564
Residential Advisors	13	26188	12	24463
Sales and Related Occupations	14	30153	14	28929
Supervisors, Sales Workers	19	40379	19	38501
First-Line Supervisors of Retail Sales Workers	16	33766	16	33843
Retail Sales Workers	13	27496	13	27665
Cashiers	14	29980	14	28552
Retail Salespersons	12	25738	13	26268
Office and Administrative Support Occupations	17	35303	16	33861
Supervisors, Office and Administrative Support Workers	24	50790	23	47739
First-Line Supervisors of Office and Administrative Support Worke	24	50790	23	47739
Communications Equipment Operators	13	27268	13	27196
Switchboard Operators, Including Answering Service	13	27268	13	27196
Financial Clerks	18	38139	18	37490
Bill and Account Collectors	17	34310	15	31739
Billing and Posting Clerks and Machine Operators	18	37249	18	36612
Bookkeeping, Accounting, and Auditing Clerks	19	39315	19	38576
Payroll and Timekeeping Clerks	20	42499	20	42057
Procurement Clerks	17	34852	16	34277
Information and Record Clerks	15	31629	15	30299
Customer Service Representatives	16	34267	16	33760
File Clerks	12	24863	12	24375
Interviewers, Except Eligibility and Loan	16	34103	15	31060
Library Assistants, Clerical	14	28089	13	26388

Human Resources Assistants, Except Payroll and Timekeeping	19	40042	19	38818
Receptionists and Information Clerks	14	29442	14	28888
Information and Record Clerks, All Other	23	47603	20	41196
Material Recording, Scheduling, Dispatching, and Distributing Workers	14	29476	14	29099
Couriers and Messengers	16	32695	16	33920
Production, Planning, and Expediting Clerks	19	39160	18	37660
Shipping, Receiving, and Traffic Clerks	15	30580	15	30606
Stock Clerks and Order Fillers	12	25982	12	25007
Secretaries and Administrative Assistants	17	35894	17	34666
Executive Secretaries and Executive Administrative Assistants	24	50078	23	47250
Medical Secretaries	16	33766	16	32327
Secretaries and Administrative Assistants, Except Legal, Medical,	18	36422	17	35923
Other Office and Administrative Support Workers	15	31366	15	30284
Data Entry Keyers	13	26112	12	23994
Mail Clerks and Mail Machine Operators, Except Postal Service	15	32127	15	30431
Office Clerks, General	15	31507	15	30474
Construction and Extraction Occupations	23	47212	23	47040
Supervisors, Construction and Extraction Workers	29	61285	30	62103
First-Line Supervisors of Construction Trades and Extraction Work	29	61285	30	62103
Construction Trades Workers	22	45336	21	43250
Carpenters	21	44693	22	44744
Electricians	26	53150	25	52635
Painters, Construction and Maintenance	18	37460	18	37852
Plumbers, Pipefitters, and Steamfitters	23	47080	22	46739
Installation, Maintenance, and Repair Occupations	21	44042	20	41760
Supervisors of Installation, Maintenance, and Repair Workers	33	67883	32	67241
First-Line Supervisors of Mechanics, Installers, and Repairers	33	67883	32	67241
Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	23	47468	22	46762
Bus and Truck Mechanics and Diesel Engine Specialists	23	47030	22	46398
Other Installation, Maintenance, and Repair Occupations	19	40349	19	39108
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	25	51776	23	48855
Medical Equipment Repairers	24	49892	24	49382
Maintenance and Repair Workers, General	19	39432	19	38509
Production Occupations	16	32333	15	31691
Printing Workers	18	37519	19	39018
Textile, Apparel, and Furnishings Workers	12	24562	12	24784
Laundry and Dry-Cleaning Workers	12	24562	12	24784
Transportation and Material Moving Occupations	17	34537	16	33066
Supervisors, Transportation and Material Moving Workers	26	54997	26	54420
First-Line Supervisors of Transportation and Material-Moving Mach	27	55534	26	54891
Air Transportation Workers	33	68062	32	67553
Commercial Pilots	NULL	68062	NULL	67553
Motor Vehicle Operators	16	33106	16	33537

Bus Drivers, School or Special Client	16	33967	17	34514
Light Truck or Delivery Services Drivers	12	25116	12	24314
Taxi Drivers and Chauffeurs	12	24779	12	24024
Material Moving Workers	12	25976	12	25712
Laborers and Freight, Stock, and Material Movers, Hand	12	25204	12	24869

Exports

No exports

Asset Maps

A baseline for delineating Business Development and Innovation Zones

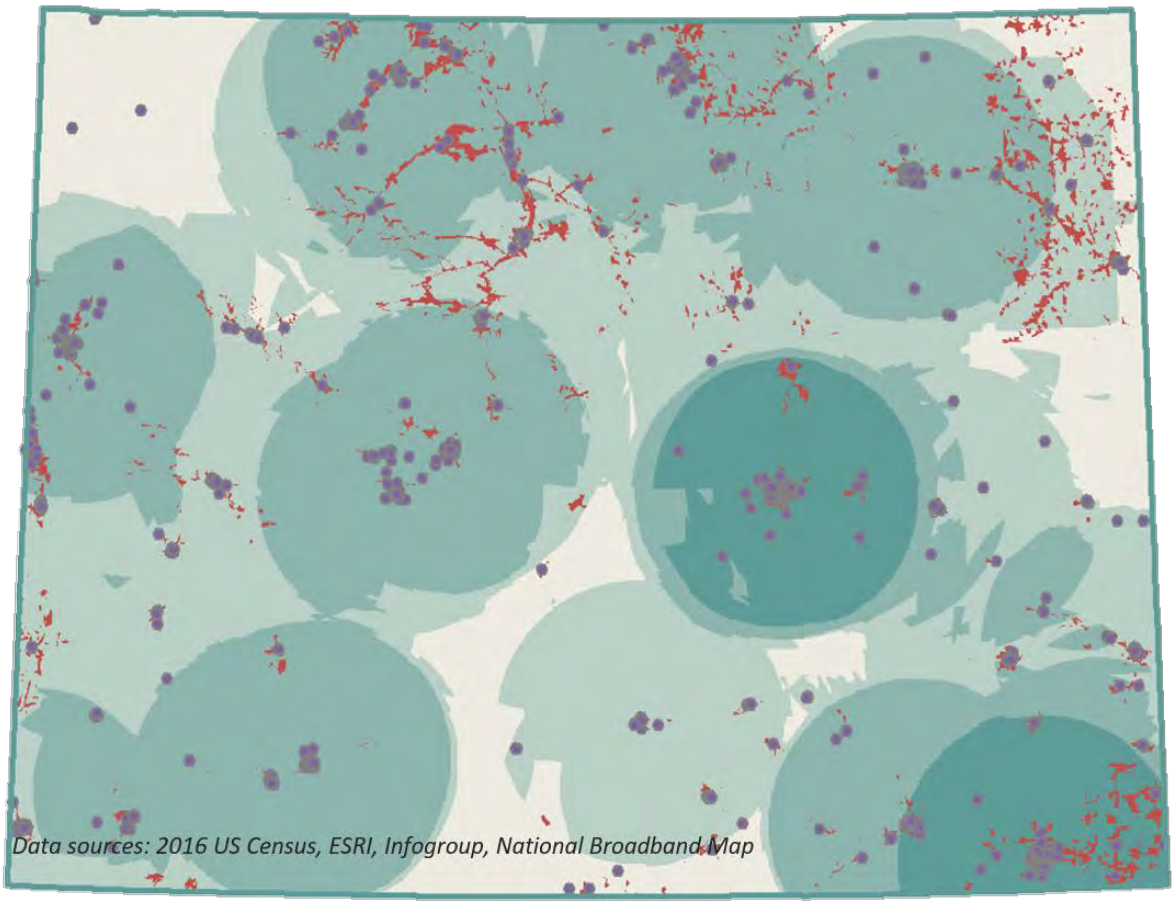
Healthcare has been identified as an important opportunity within the Education and Health Services sectors. While maps here are focused on this opportunity, assets of industries within the Education sector are required for success of other sectors, and are represented in those sections.

Mappable Sector Assets

Healthcare

Infrastructure	Workforce
•Wired Internet •Current Businesses •Heatlhcare demand (population)	•Doctors •Other Healthcare Workers •Wages •Medical Schools •Other Healthcare Education Programs •Livability •Housing •Availability •Cost

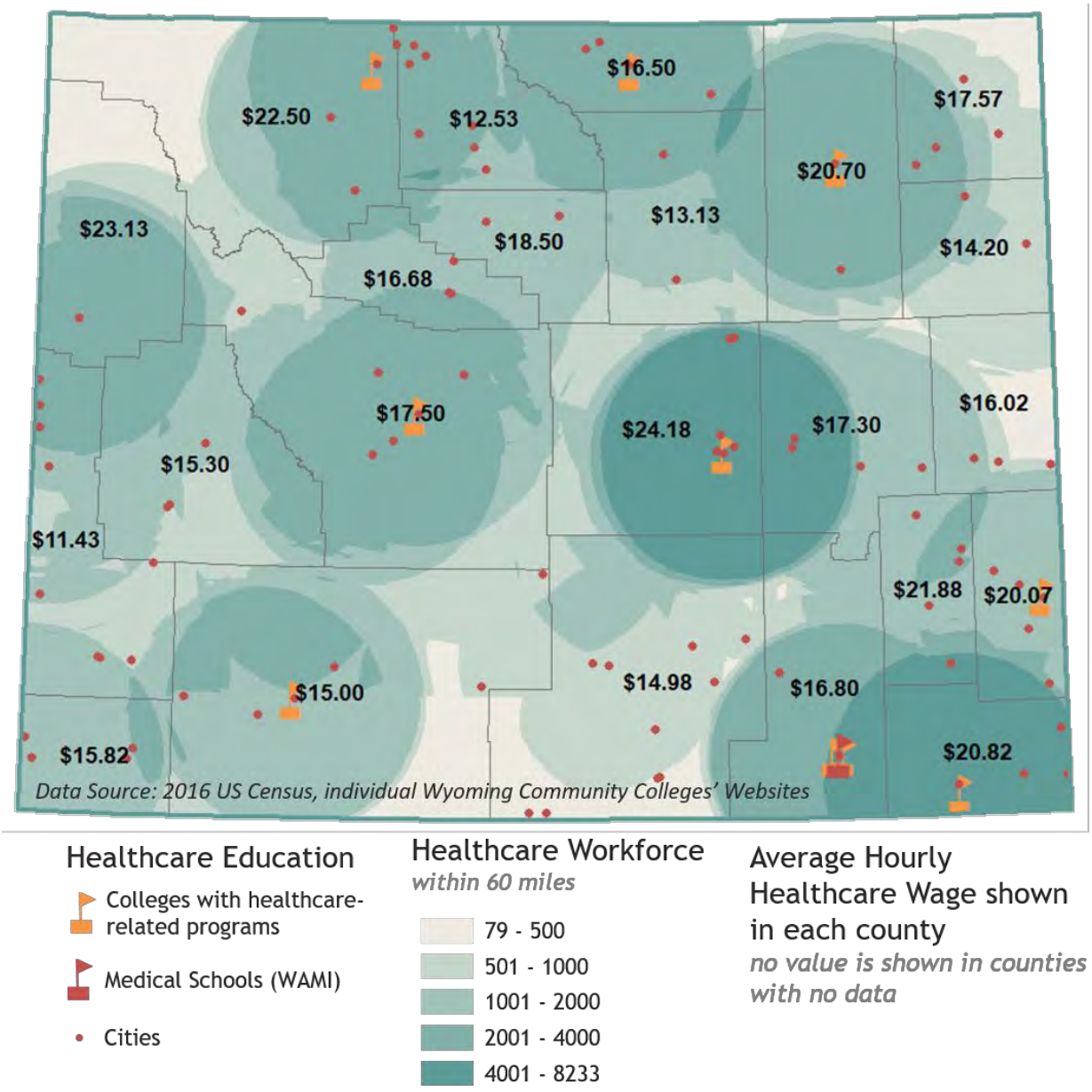
Infrastructure



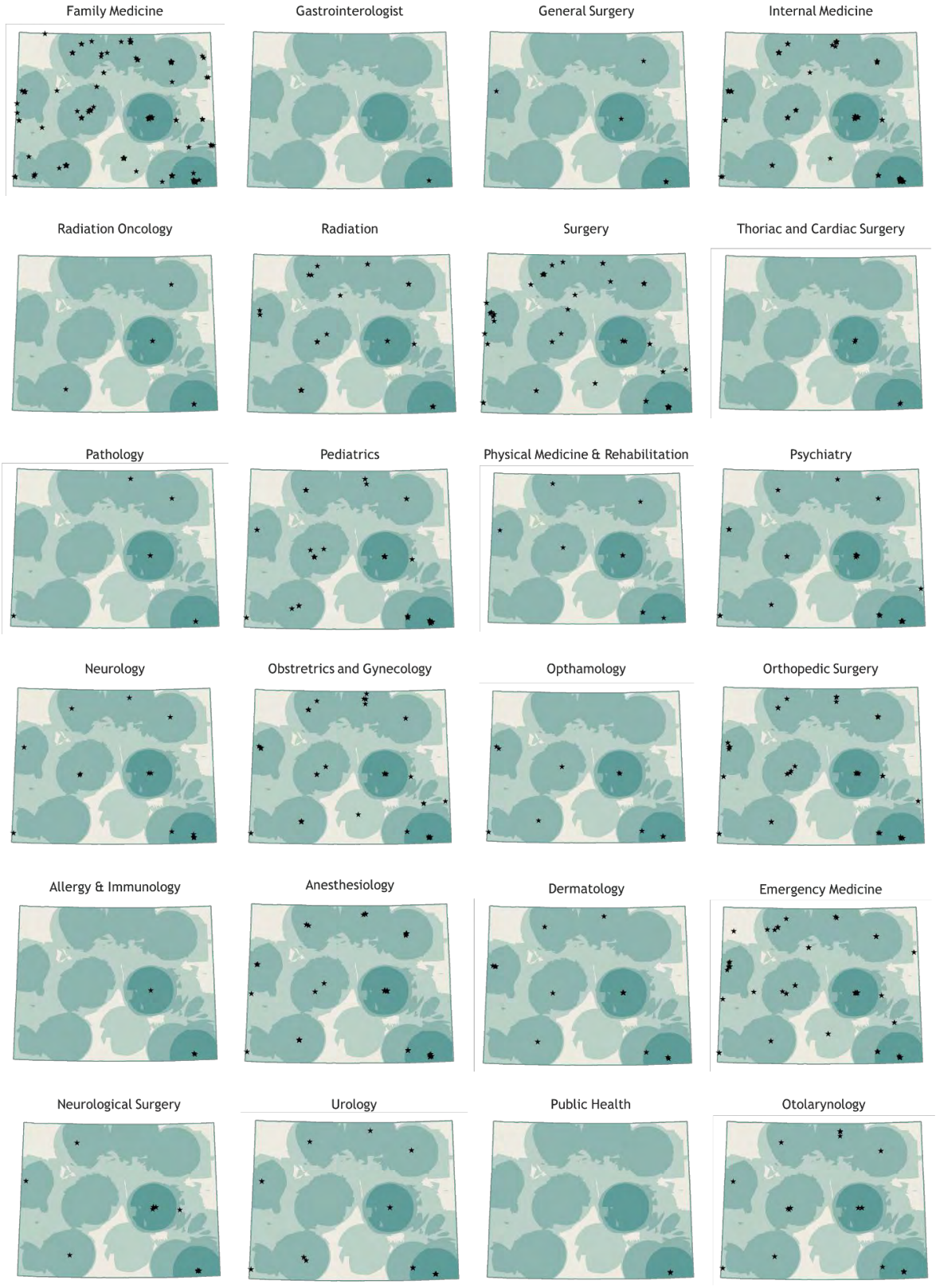
Workforce

According to site selector rules of thumb, employees are willing to drive a maximum of ~60 miles to work. Workforce data comes from the 2016 US Census, and includes those who are employed or looking for employment in the Education, Healthcare, and Social Services sector.

All Healthcare Workforce



Physicians



Data Source: Wyoming Board of Medicine, 2016 US Census

Doctor

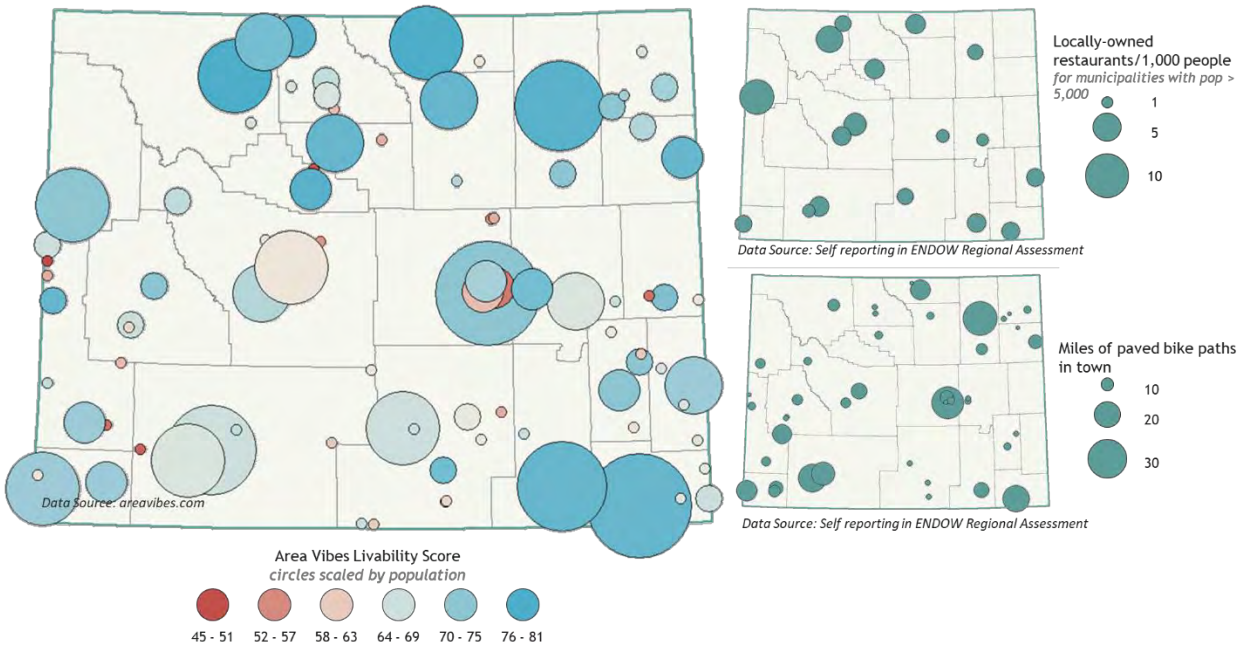
Population *Healthcare Demand*

2,525 - 15,000 | 15,001 - 30,000 | 30,001 - 90,000 | 90,001 - 155,261

Workforce Enablers

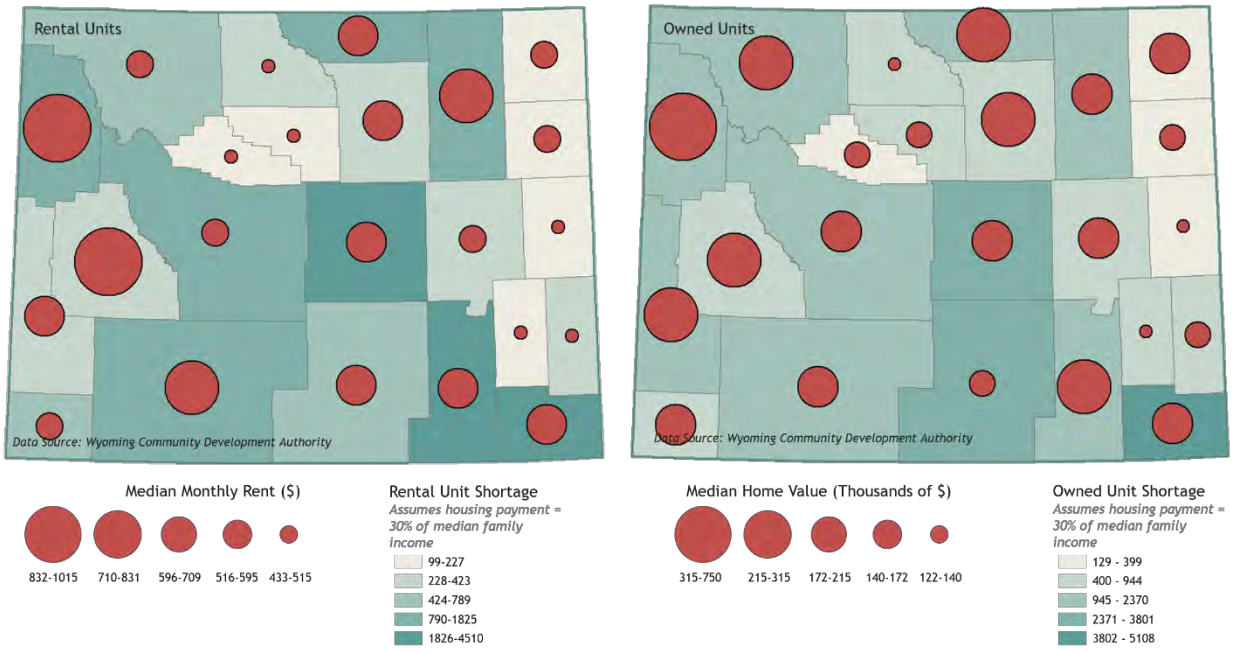
Livability and housing enable recruitment and retention of workforce.

Livability



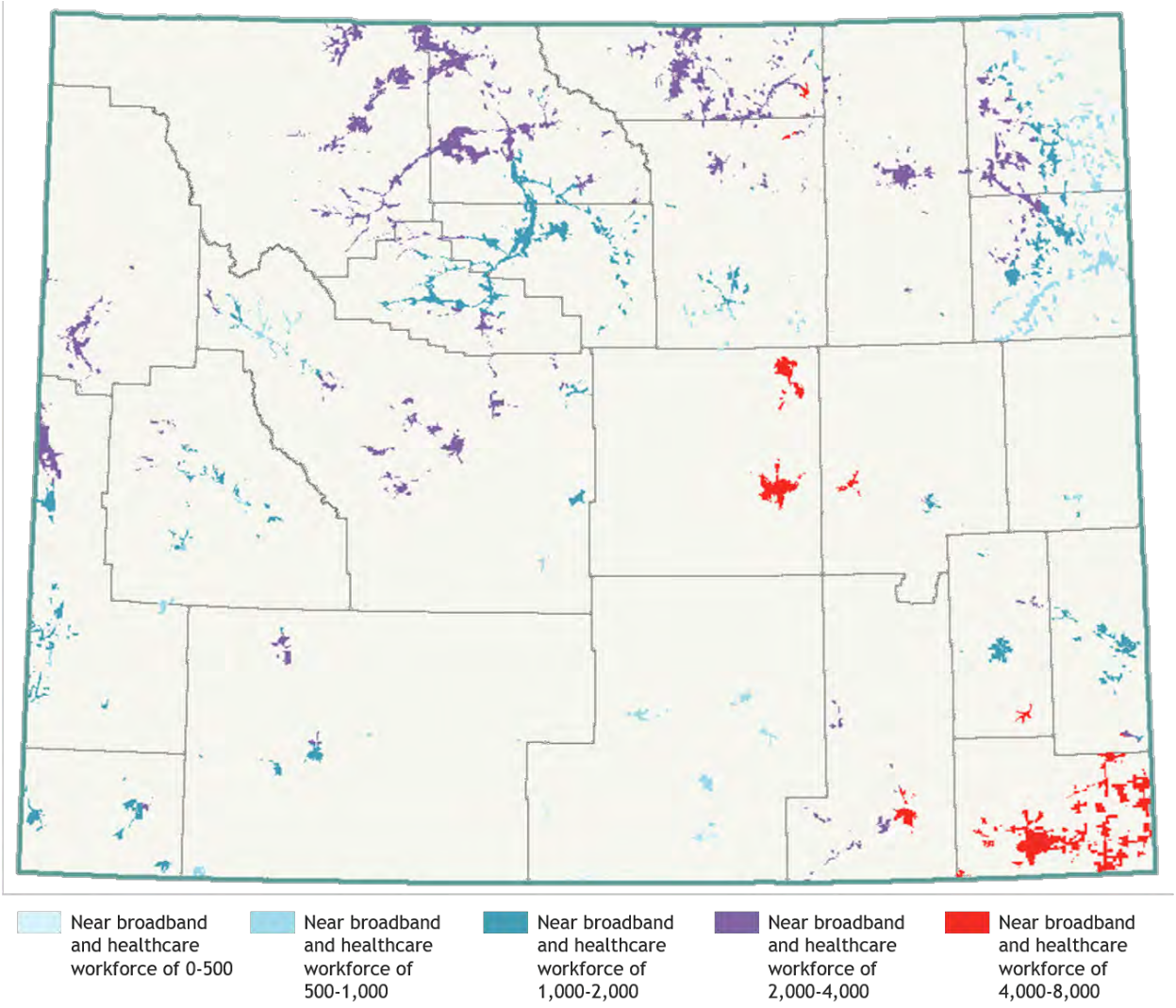
Areavibes uses metrics for amenities, cost of living, crime, education, employment, housing, and weather to estimate a livability score on a scale of 0-100. The US average is 66, which corresponds to the duller colors on this map

Housing



Industry Asset Intersections

Intersections shown below, sites within these areas, areas characterized by one or more input assets (e.g. workforce), or intersections amongst sectors may be considered potential business development and innovation zones. More focused analyses will be presented in the report submitted to the Legislature and Governor before December 31st, 2017.



Asset Mapping Conclusions

Healthcare

Healthcare intersections are driven by broadband, healthcare demand, and workforce—both physicians, and other healthcare workers.

While physicians, especially some specialties, are concentrated in certain areas in the state, healthcare demand (population) is distributed throughout Wyoming.

Industry experts have cited physician recruitment and retention as a limiting factor to healthcare in Wyoming. An important enabler to this, and to healthcare workforce and retention as a whole, is livability.

Enablers

Education, Health Care, and Social Assistance
Enablers
No corporate and personal income tax
Wyoming's outdoor lifestyle and livability
Community College Training Programs
Incentives
BRC - Business Committed Grants
BRC - Community Enhancement Grants
BRC - Community Readiness Grants
Challenge Loan
Workforce Training Grants
Challenges
Recruiting doctors
Lack of amenities to attract talent
Lack of skilled workforce (nurses shortage, etc.)
Availabiltiy of workforce
Broadband may be a challenge in some parts of Wyoming
Lack of long-term, comprehensive air service solution

Obstacles

See above

Opportunities

Health care – clinics, centers, aging options, telehealth

Leisure and Hospitality (71-72)

Summary of Sector

What Businesses are in the sector?

Restaurants, tourism, coffee shops, bed and breakfasts, hunting/fishing, accomodation/food services, arts/entertainment/recreation, bakeries, outfitting, outdoor recreation, candy shops, visual arts, performing arts, music, gaming, roasteries, wineries, distilleries, craft brewing and agro-tourism

Compare to US and other states

Wyoming is on par with the US average for this industry. This is comparable with many surrounding states, but lags behind Colorado, New Mexico and Utah. Activities from this sector contributed 3.7% to Wyoming's GDP in 2016 compared to 3.9% for the US. If Wyoming were at the US average, it would add $69 million to the state's GDP.

Workforce

Wages within this sector pay below the mean and median for all occupations. In Wyoming, however, wages are less than the US average, but pay more than some surrounding states including Idaho, Montana, New Mexico, North Dakota, South Dakota and Utah.

Barriers and obstacles

Stable and consistent access to big game hunting licenses, lack of available and sustainable air service, lack of available workforce, uncertain future of land use and access at federal level

Opportunities

Tourism; art; new potential wolf and grizzly hunting markets; take advantage of Wyoming resources including lots of animals, open spaces and quality outfitting industry; ensure a system of stable licensing

Emerging Trends

- Incoming young workforce in need of opportunities
- Gaming industry attempts to broaden and enter new markets, expanding on E-Casinos, sports gaming and underutilized opportunities
- Many aspects of the outdoor recreation industry are growing because of changing technology and an increased desire for personalized experience
- Because of regular exposure to brands such as amazon and Starbucks, consumers have expectations of instant, responsive, mobile and seamless travel experiences
- Health, safety, social impact, experience and transparency have become new drivers of the food service industry

Trends

Industry Input

Trending sportsmen continue to view Wyoming favorable. Wyoming is seen as a great place to hunt and easy to get there. Our industry continues to enjoy relatively good conditions.

-Wyoming Outfitters & Guides Association

A great deal of performing, visual, and literary arts are created by individuals working in isolation which makes Wyoming's small population and beautiful landscapes ideal for the creation of art. However, in order for artists to grow they must have the ability to share ideas, be critiqued by other artists, and gather with other artists for professional development. The ability of the state to offer strong professional development to artists, along with individual and small business support (healthcare, tax incentives, etc) will be needed to grow the sector.

Although national philanthropic giving to the arts has grown over the past decade, the majority of the growth has happened in urban areas, outside of Wyoming. The majority of all arts activities in Wyoming, which drive livability and business growth in all sectors, is delivered by non-profits and municipalities. With the low population and lack of many corporations and corporation's headquarters located out of state, these non-profits struggle to get strong philanthropic support.

An education in the arts is crucial to not only growing the arts and cultural sector but to the growth and advancement of the entire economy. This area of study helps teach the needed skills to succeed in all areas of the workforce, not just the arts. A Conference Board Report study titled "Are They Really Ready To Work?" was quoted as saying, "We need people who think with the creative side of their brains, people who have played in a band, who have painted, been involved in the community as volunteers. It enhances symbiotic thinking capabilities, not always thinking in the same paradigm, but learning how to kick-start a new idea, or how to get a job done better, less expensively." Ninety-seven percent of U.S. employers say creativity is of increasing importance to them. Eighty-five percent of employers looking to hire creative people say they are unable to find the applicants they seek. The teaching a creativity through the arts will help build a stronger workforce.

The arts are a triple factor. They are their own industry; provide livability to communities, making communities attractive to all business development; and an education in the arts builds strong creative thinking capabilities needed in the 21st century workforce.

-Wyoming Arts Council

Arts (Performing Arts, Galleries and Museums)

Nonprofits Are Being Expected to Play by For-Profit Rules: Sixty percent of the revenue for nonprofit arts organizations comes from the sale of tickets, merchandise, and services. This means that they are operating more and more like small businesses. Current public and private funding trends are nudging arts nonprofits further toward more innovative ways of creating revenue while staying true to their mission, but too much focus on revenue generation can distract from the standing model of nonprofits as mission driven organizations for the benefit of society.

Target Markets Are Changing and Expanding: Studies show that there has been a declining share of the population attending an art museum or live performing arts event, but there is nothing traditional about the landscape of cultural consumption today. Downloads of classical music are at an all-time high. Art- and culture-themed shows fill the television airwaves. Fifty percent of the American public say they are makers of art in some way. More and more, the arts will be adapting to the new, broad landscape of multi-sector and multi-media opportunity.

Tomorrow's Leaders Need Opportunities for Development and Growth: Younger leaders among Gen X, Gen Y and Millennials will still see fewer current leaders in top positions moving on or retiring. Better health and continuing interest and passion on the part of Baby Boomers, along with challenged retirement portfolios, will keep more current leaders in place for now, suppressing opportunities to grow within established organizations. This in turn will continue the trend toward growing new startups and increasing the pool of nonprofit and for-profit arts organizations.

The Necessity of Collaboration: Across the country, arts organizations are partnering with military and veterans organizations, urban equity programs, and businesses and helping to address homelessness, hunger, and other social issues.

Gambling/Casinos

Online: Lotteries and casinos will both seek online opportunities — sometimes with competing efforts in the same states and countries, creating competitive challenges that legislators and regulators must sort out.

Footprint: Casinos will leverage their under-utilized square footage to create special attractions for Millennials, including lounges, entertainment, and skill-based gaming options.

Legislation: States will attempt to overcome stagnating gaming receipts by proposing new forms of, or locations for, gaming such as retail gaming (i.e., a limited number of electronic gaming devices in liquor-licensed establishments), satellite casinos, and slots at airports.

Lobbying: Proponents of legalized sports betting — including the American Gaming Association, state associations and individual operators — will push their agenda more forcefully as state budgets continue to be strained, and as major sports leagues seek to capture a substantial new revenue stream.

Management: The trend toward private management and, in some instances, private ownership of lotteries will accelerate in various countries and US states.

Tax Revenues: State Legislatures will face pressure to reduce gaming tax rates, as well as to amend or streamline regulations, in response to increasing competition and the potential for saturation in various markets.

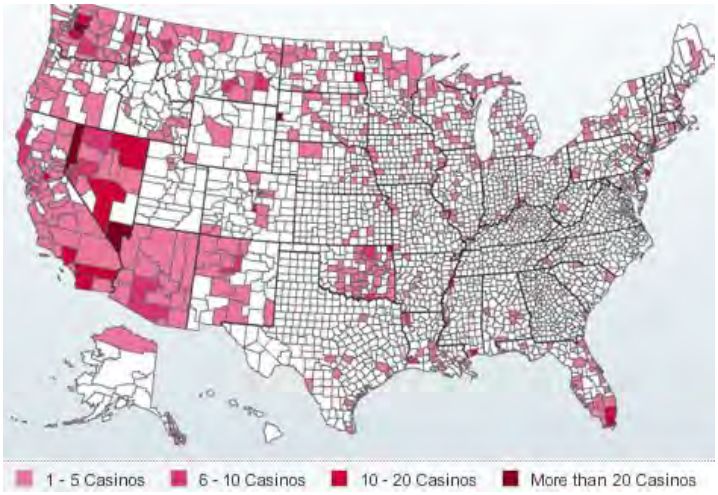
E-Sports: More casinos in Las Vegas and Atlantic City will stage eSports events and contests, while Atlantic City will attempt to reposition itself as an eSports hub.

New Opportunities: The South will be a focus of casino opportunities, as the potential for legalization and expansion is debated in Alabama, Florida, Georgia, and Louisiana.

Sources:

https://news.worldcasinodirectory.com/ top-10-casino-industry-trends-for-2017-identified-by-spectrum-gaming-group-39051

http://dor.sd.gov/Gaming/Industry_Statistics



Recreation (General Outdoor)

Fishing: Fishing remains among the most popular outdoor activities for adults, according to the 2016 Special Report on Fishing from the Recreational Boating & Fishing Foundation (RBFF) and the Outdoor Foundation. Fishing is the second most popular outdoor activity for adults ages 25+, behind running. Freshwater fishing remains the most popular type of fishing, engaged in by almost 38 million people.

Camping: Several technological factors are influencing how people choose campgrounds. Campers who expect free WiFi are three times more likely to be influenced in their campground selection by the

presence of free WiFi. Surprisingly, millennials are no more likely to be influenced by, nor expect, free WiFi when compared to older campers.

Boating: The marine industry should grow for two to three more years as consumer confidence and spending continue to strengthen, according to National Marine Manufacturers Association President Thom Dammrich. From 2011 through 2015, boat sales grew in the 5 to 6% range, and according to Dammrich, retail sales could be up in the 8 to 10% range annually in the next several years. Most segments in new boat sales are growing, with personal watercraft sales increasing by 15.5%, and pontoons by 11.5% from June 2015 to 2016. Cruiser sales grew nearly 1%, and saltwater fishing boat sales grew 9.4%.

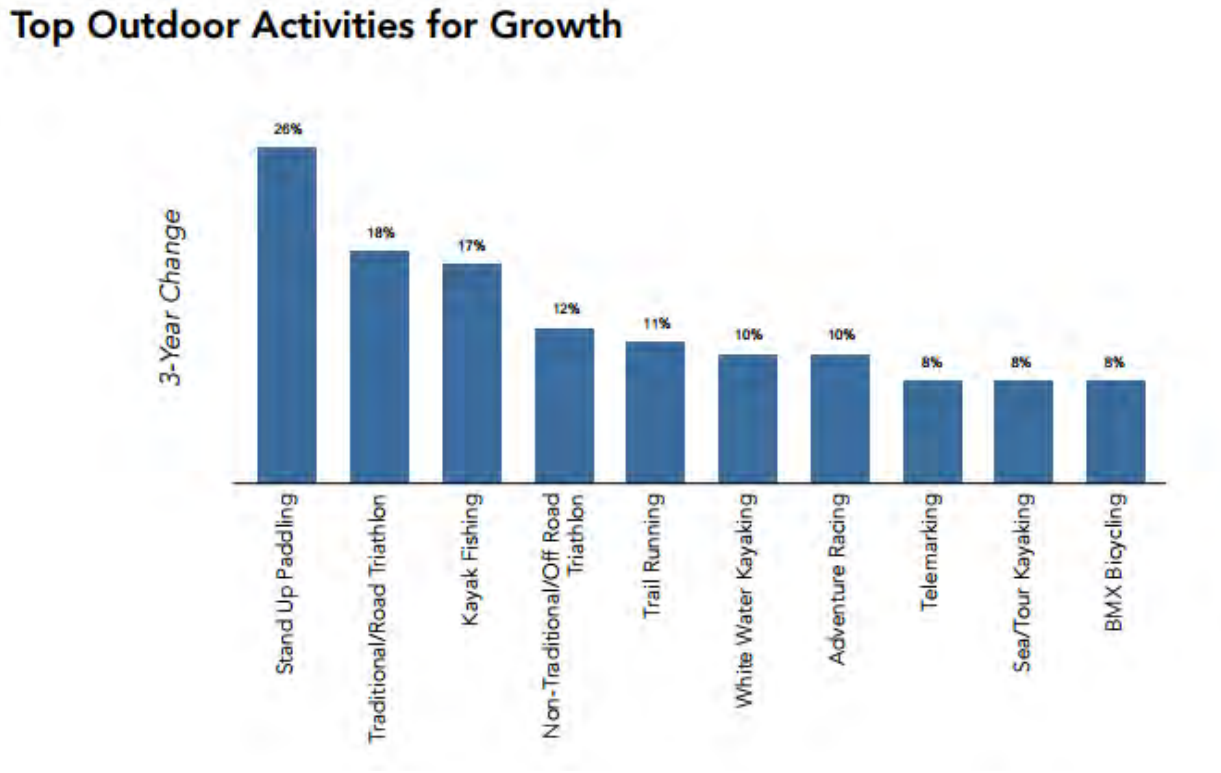
Horseback Riding: Recreational horseback riding is the largest segment of the horse industry both in numbers of horses and economic impact. More than 1,000 different rides are available across America's public lands. According to the American Horse Council, roughly 3.9 million horses are used for recreational riding. This segment of the horse industry alone contributes $32 billion a year to the national economy. Recreational riding is directly responsible for 128,000 jobs and supports nearly 437,000 jobs in the U.S.

Skiing: According to the National Ski Areas Association, U.S. ski areas have averaged 54 million skier/snowboarder visits to resorts over the past five seasons. Last season saw a return to traditional winter-weather patterns on the west coast, resulting in near-record visits in California, Oregon and Washington. The destination resorts in the Rocky Mountain West had a very good year with strong ticket sales, up almost 13% over the previous year. The Midwest and East suffered through a warm winter with reduced snowmaking opportunities, resulting in double-digit downturns.

Snowmobiling: Sales of snowmobiles remain steady, supporting five years of growth, according to the International Snowmobile Manufacturers Association. Over 60,000 new snowmobiles were sold in the U.S. last year. Annual registration of snowmobiles is reported at 1.4 million. Average use grew 10%, supporting expansion of snowmobiling's economic impact in rural America. Fall shows are reporting record attendance and optimistic dealers are taking orders. Overall, the La Niña weather forecast of cold weather and snow has the community looking forward to a great year.

Archery: Archery participation in America climbed about 14% from 2012 to 2014, boosting the number of archers to 21.6 million, an increase that can partially be attributed to the prominence of The Hunger Games books and movies. According to a study from the Archery Trade Association (ATA), 78% of archery participants are male, and 22% are female. Overall, archery participants are typically younger and from rural communities. Of the more than 21 million archers in the U.S., 45% shoot target archery only, while 24% identify strictly as bowhunters. ATA also found that the number-one influence in getting people into archery is family interest in the sport.

Adventure Sports: Improved economic conditions and better weather resulted in stronger demand for outdoor recreation services in 2016 when compared to outfitters' performance in 2015, according to America Outdoors Association (AOA). Eighty percent of outfitters reported stronger demand and profitability in 2016 in the AOA annual survey; 73% of outfitters expect strong to modest growth in demand for their service in 2017. Growth is strongest among outfitters offering stand-up paddleboard instruction, cabin rentals, interpretive trips, environmental education and paddle sports activities. Moving forward, outfitters' number-one concern is the potential for higher fees, taxes and regulatory costs, followed by higher insurance and labor costs.



Sources:

http://www.outdoorfoundation.org/pdf/ResearchParticipation2016Topline.pdf

http://www.funoutdoors.com/files/Outdoor%20Recreation%20Outlook%202017.pdf

https://www.handshake.com/blog/outdoor-industry-trends/

Recreation (**Hunting)**

Crossbows: With 24 states now allowing crossbows for all hunters during part of or the entire archery season (and more planning to), some manufacturers are seeing 50 to 100 -percent sales growth per year. Meanwhile, bow-season participation in -crossbow-friendly states is sharply up.

Suppressors: So-called silencers, which reduce noise levels below a safe 140-decibel threshold, are currently legal to own in 39 states and are legal for hunting in 30. Thanks to intense public--education campaigns, that number will increase to include all states except California, Hawaii, New Jersey, and Massachusetts by 2020.

Sleeper Whitetail States: As longtime hotspots like Illinois and Iowa begin to decline, up-and-comers will take their place, including Indiana, Idaho, Washington, Michigan Mississippi and Oklahoma.

Gender Gap: Bass Pro Shops owner Johnny Morris recently stated the sale of women's products was just 3 percent of his business 10 years ago, and now it's 30 percent.

Gear:

Extreme cold-weather protection: Aerogel, the planet's best known thermal insulator, has been converted into an ultrathin clothing liner via nanotechnology and is available in camo hunting garments through Shiver Shield.

Lead Substitute: There is a race to find a cost-effective, high-performance substitute for lead, Advanced Ballistic Concepts believes it has already crossed the tape for target loads with its Zuerillium Alloy bullets (a.k.a. Green Lead; mibullet.com). The company is currently working on hunting-load applications, and is hardly alone.

Modern sporting rifles: Modern technology is surpassing bolt-action models as the preferred sporting rifle. In 2013, 20 percent of all firearms sold were MSRs, compared with just 14 percent traditional sporting rifles, according to the National Shooting Sports Foundation, which further predicts that MSR-owning target shooters will increasingly expand into hunting. Meanwhile, the number of hunting calibers available in MSRs seems to double yearly. The lever action and pump will ultimately vanish.

Chronic Wasting Disease: While epizootic hemorrhagic disease grabs the headlines, chronic wasting disease is old news that makes folks fall gently to sleep. But whereas EHD is annual and localized, CWD is persistent and spreading. While we've been snoozing, it's gotten far worse. In Wisconsin's CWD core area, the percentage of 21⁄2-year-old or older bucks with the disease has jumped from 7 or 8 percent in 2002 to over 20 percent today, according to the QDMA. In some western states, more than 30 percent of the population is infected. There's still no cure or vaccine.

Source: http://www.fieldandstream.com/articles/hunting/2014/04/whats-next-predictions-future-hunting-fishing-and-conservation#page-10

Accommodation

Economy: One of the biggest challenges hoteliers will face is sustaining growth as online private accommodation aggregators flood the marketplace with new inventory. There is little doubt that companies like Airbnb already compete head-to-head with hotels in certain segments of the market. Some of this business may be additive, as travelers take more or longer trips than they would without the option, but perhaps more importantly, private accommodations have altered consumer expectations on a fundamental level—by redefining what and where a hotel is. The hotel industry has

proved to be extremely resilient during this marketplace shift. Industry forecasts project continued success, estimating a 4.3 percent gain in hotel revenues for 2017. This is phenomenal growth considering one in three US leisure travelers stayed in some form of private accommodations in 2015.12to hit record-high

Consumer Minds Sets

Brand Expectations: With the exception of frequent business travelers, most consumers do not travel very often—maybe two or three times a year. Their exposure to travel brands is relatively limited. Everyday brands such as Amazon and Starbucks showcase their innovation and services to their customers often—sometimes daily. Many of these brands are leading on the customer experience front and setting the bar high for consumers' expectations.

Personalized Experience: There should be no doubt as to whether the rising penchant for authentic and unique products and experiences is real. Some examples include the explosion of craft beer, the rising demand for locally sourced and organic food; and even "indie" music has gone mainstream. The customer is changing, and it's impacting travel in a big way. The rapid growth of Airbnb proves an enormous market for travel products outside of mainstream offerings— smart hoteliers are capitalizing on the trend.

Enabling Technology

Paradigm: Travel companies must first envision the customer experience they want to deliver. Then, they can explore the technology options best suited to support their goals. Companies should resist the urge to invest in new technology simply because it seems innovative.

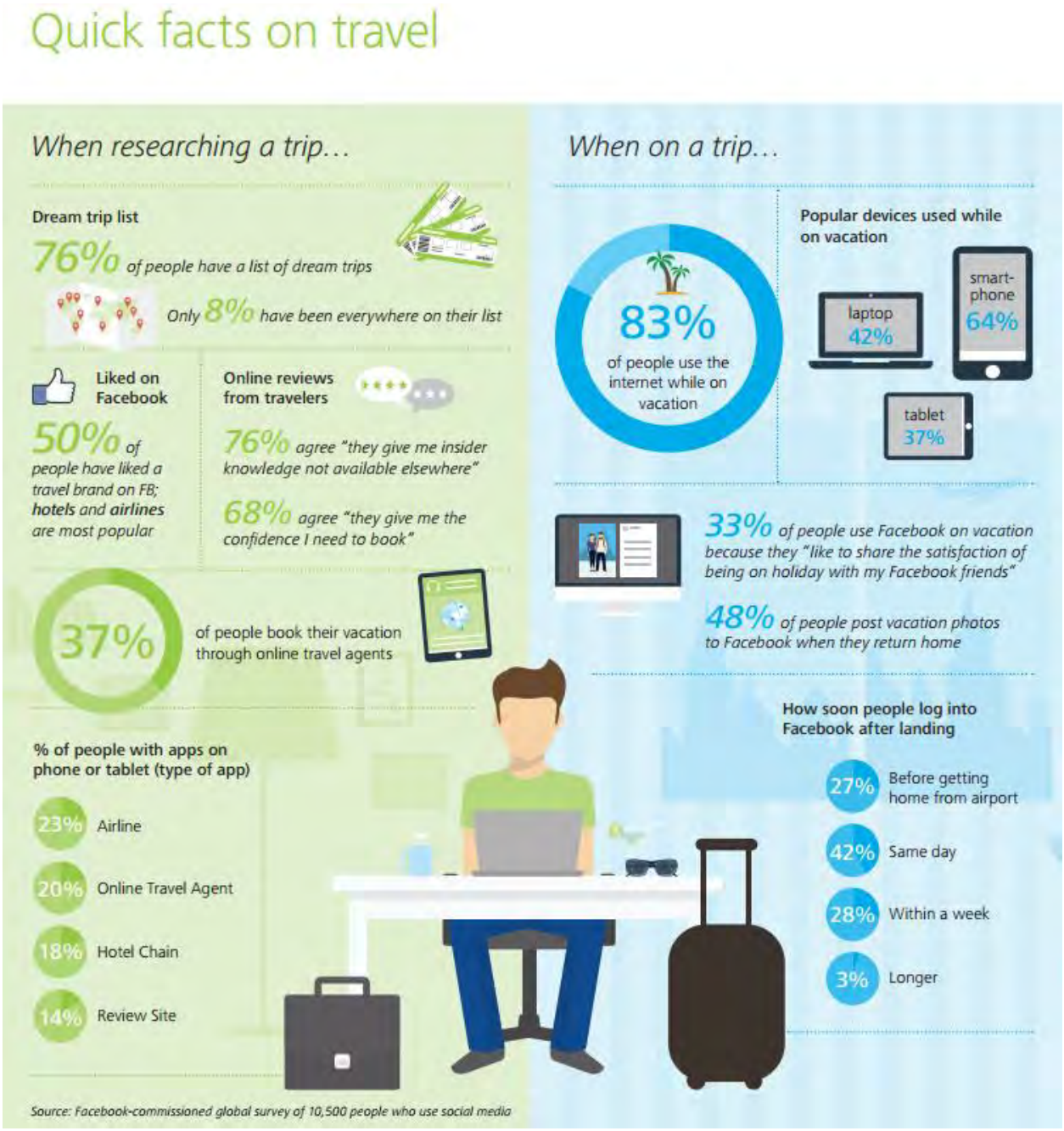
Mobile: Until now, travel suppliers such as hotels and airlines have tested waters with basic functionality—including flight/hotel check-ins, boarding passes, itinerary updates, and shopping/booking capability. A confluence of technologies, including faster processing power, cloud computing, and IoT will come together to push the mobile channel to the next level; improving trip experience.

Artificial Intelligence: AI is software built to think like a human—and is at an evolutionary tipping point. Consumers already encounter elements of AI in their daily life in the form of complex yet overlooked functionality, such as texting autocorrect and product recommendations. Tech giants such as Google, Apple and Amazon are all heavily engaged in an AI arms race.

Sensors: Imagine a groggy business traveler arriving at a hotel after a sleepless red-eye flight. Upon entering the lobby, the traveler's smartphone communicates with hotel property management systems (PMS) and automates check-in. The PMS then sends an alert to the closest member of hotel staff to greet the guest by name and help with luggage. When the traveler approaches their room, the door automatically unlocks and the lighting, temperature, and entertainment settings automatically adjust to the traveler's preferences. After ordering room service, a connected dining tray senses the guest is finished eating, and alerts housekeeping for pick-up. It's no surprise that this traveler books with this hotel often because they find the experience to be exceptional.

Ground Transportation: The ridesharing economic model is a complex balance that connects a healthy supply of non-contract, transient labor looking for the highest wage with demand from consumers looking for the lowest fare. Inevitably, ridesharing companies continue to battle for the long-term

sustainability of the economic model while still navigating a complex regulatory environment involving labor and public safety.



Source: https://www2.deloitte.com/us/en/pages/consumer-business/articles/travel-hospitality-industry-outlook.html

Food Service

Traditional drivers include price, taste and convenience. These primary factors have historically dictated the success or failure of food service businesses.

New/Evolving Drivers and Insights

Health/wellness: Definition varies and includes attributes ranging from nutritional content to organic production to all-natural ingredients to fewer artificial ingredients. Companies must decode and dissect the nuances of consumer preferences around Health and Wellness, and then act quickly to respond.

Safety: Safety applies to both product attributes such as absence of allergens and fewer ingredients, and company attributes like detailed accurate labeling. Companies should broaden their definition of "safety" to manage and satisfy an expanded set of consumer expectations.

Social impact: Social impact encompasses company attributes such as local sourcing, sustainability, animal welfare, and fair treatment of employees. Companies must identify which issues have most opportunity or represent the greatest risk, and when to lead vs. follow.

Experience: Experience includes retail store layout and services, channel innovation, brand interaction, and personalized engagement spanning pre, during, and post-purchase. Manufacturers must authentically engage with consumers, both directly and in partnership with retailers.

Transparency: Transparency requires product attributes such as clear labeling, certification by trusted third parties, and company attributes like access and trust. Companies should gather and provide access to all relevant information, and be prepared for two-way engagement to promote trust.

Source: https://www2.deloitte.com/us/en/pages/consumer-business/articles/us-food-industry-consumer-trends-report.html

Industry Focus Around the State

Communities around the state have identified the following specific focus industries within the Leisure and Hospitality sector. This data was collected using the ENDOW Regional Assessment.

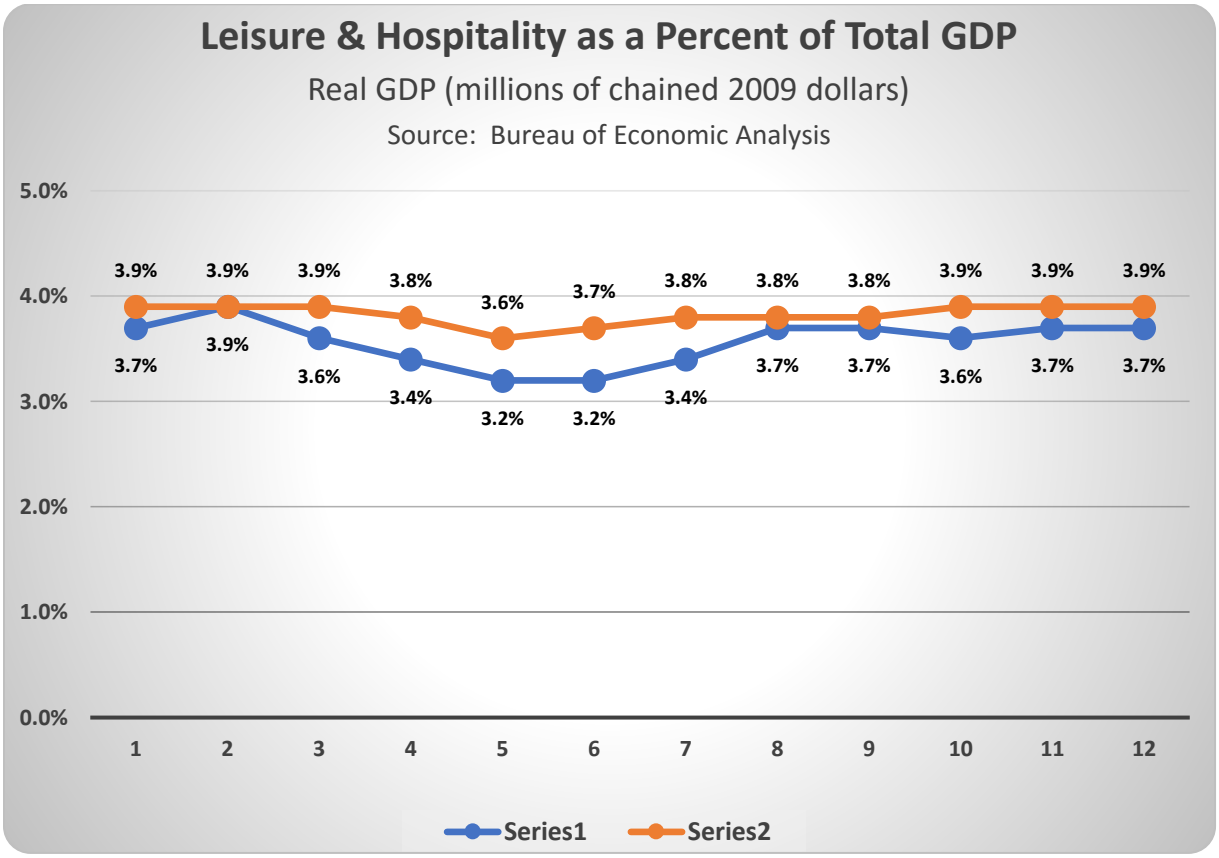
Restarurants	Tourism	Coffee Shops
Bed & Breakfasts	Hunting & Fishing	Accomodation & Food Services
Arts, Entertainment, And Recreation	Local Steakhouses	Bakeries And Tortilla Manufacturing
Outfitting	Outdoor Recreation	Speciality Bake/Candy Shop
Visual Arts	Performing Arts	Music
Roasteries	Wineries	Distilleries
Artisans/Creative Class	Craft Brewing	Agritourism

How does Wyoming compare?

WY Leisure & Hospitality as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Leisure & Hospitality	% of Total GDP
2005	$29,637	$1,107	3.7%
2010	$36,469	$1,184	3.2%
2016	$34,439	$1,281	3.7%

U.S. Leisure & Hospitality as a % of Total GDP			
Real GDP (millions of chained 2009 dollars)			
Date	Total GDP	Leisure & Hospitality	% of Total GDP
2005	$14,203,241	$559,329	3.9%
2010	$14,628,165	$541,278	3.7%
2016	$16,342,925	$630,288	3.9%

Source: Bureau of Economic Analysis



Over the next 20 years, if Wyoming increases the 3.7% Leisure and Hospitality GDP to equal the 3.9% GDP of the US, that .2% increase would equate to $68 million.

Wyoming and United States Leisure and Hospitality Sector GDP

Real GDP (millions of chained 2009 dollars)

Industry	2005				2010			
	WY		U.S.		WY		U.S.	
	GDP	% of Total Leisure and Hospitality GDP	GDP	% of Total Leisure and Hospitality GDP	GDP	% of Total Leisure and Hospitality GDP	GDP	% of Total Leisure and Hospitality GDP
Arts, Entertainment, and Recreation	$ 169	15.3%	$ 137,867	24.6%	$ 197	16.6%	$ 144,904	26.8%
Accommodation and Food Services	$ 939	84.8%	$ 421,724	75.4%	$ 987	83.4%	$ 396,367	73.2%

Industry	2015			
	WY		U.S.	
	GDP	% of Total Leisure and Hospitality GDP	GDP	% of Total Leisure and Hospitality GDP
Arts, Entertainment, and Recreation	$ 216	19.8%	$ 168,545	27.0%
Accommodation and Food Services	$ 1,091	83.4%	$ 454,967	73.0%

States with the Highest and Lowest Shares of Leisure and Hospitality, 2016

(as a Percentage of Their Gross State Product)

Top Five States		Bottom Five States	
Nevada	16.9%	Arkansas	2.9%
Hawaii	9.4%	Iowa	2.8%
Florida	6.0%	Delaware	2.8%
Vermont	5.5%	Nebraska	2.6%
Montana	5.0%	North Dakota	2.5%

In 2016, Wyoming ranked 21st in the nation at 3.7%

Leisure and Hospitality play a significant role in our national economy, accounting for roughly 3.9 percent of the United States GDP. Wyoming would rank 18th in the nation for leisure and hospitality if we grow our GDP to 3.9 percent.

Percentage Leisure and Hospitality Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Leisure and Hospitality GDP	% of Total GDP
Wyoming	$1,281	3.7%
Alaska	$1,532	3.2%
Colorado	$13,490	4.6%
Idaho	$1,995	3.3%
Montana	$2,063	5.0%
New Mexico	$3,160	3.7%
North Dakota	$1,168	2.5%
South Dakota	$1,534	3.7%
Utah	$4,305	3.2%
United States	$630,288	3.9%

Source: Bureau of Economic Analysis

Percentage Leisure and Hospitality Contributes to Total Employment

2016

	Leisure and Hospitality Employment	% of Total Employment
Wyoming	35,850	13.2%
Alaska	35,256	10.8%
Colorado	323,340	12.7%
Idaho	71,697	10.4%
Montana	64,330	14.1%
New Mexico	95,470	11.8%
North Dakota	39,294	9.4%
South Dakota	46,732	11.1%
Utah	138,686	10.0%
United States	15,556,191	11.0%

Source: Bureau of Labor Statistics

Wyoming and United States Leisure and Hospitality Sector Establishments

Industry	2005				2010			
	WY		U.S.		WY		U.S.	
Leisure and Hospitality	#	% of Total Leisure and Hospitality	#	% of Total Leisure and Hospitality	#	% of Total Leisure and Hospitality	#	% of Total Leisure and Hospitality
Performing Arts and Spectator Sports	85	3.8%	43,455	6.3%	88	3.9%	47,563	6.4%
Museums, Historical Sites, Zoos, and Parks	18	0.8%	5,192	0.8%	21	0.9%	5,671	0.8%
Amusements, Gambling, and Recreation	326	14.7%	69,967	10.1%	287	12.8%	71,112	9.5%
Accommodation	565	25.4%	61,828	8.9%	590	26.3%	64,755	8.7%
Food Services and Drinking Places	1,229	55.3%	510,963	73.9%	1,261	56.1%	555,688	74.6%

Industry	2016			
	WY		U.S.	
Leisure and Hospitality	#	% of Total Leisure and Hospitality	#	% of Total Leisure and Hospitality
Performing Arts and Spectator Sports	89	3.8%	53,420	6.5%
Museums, Historical Sites, Zoos, and Parks	24	1.0%	6,359	0.8%
Amusements, Gambling, and Recreation	306	13.1%	78,534	9.6%
Accommodation	614	26.3%	68,476	8.4%

Food Services and Drinking Places	1,305	55.8%		613,191	74.8%

Businesses in the sector

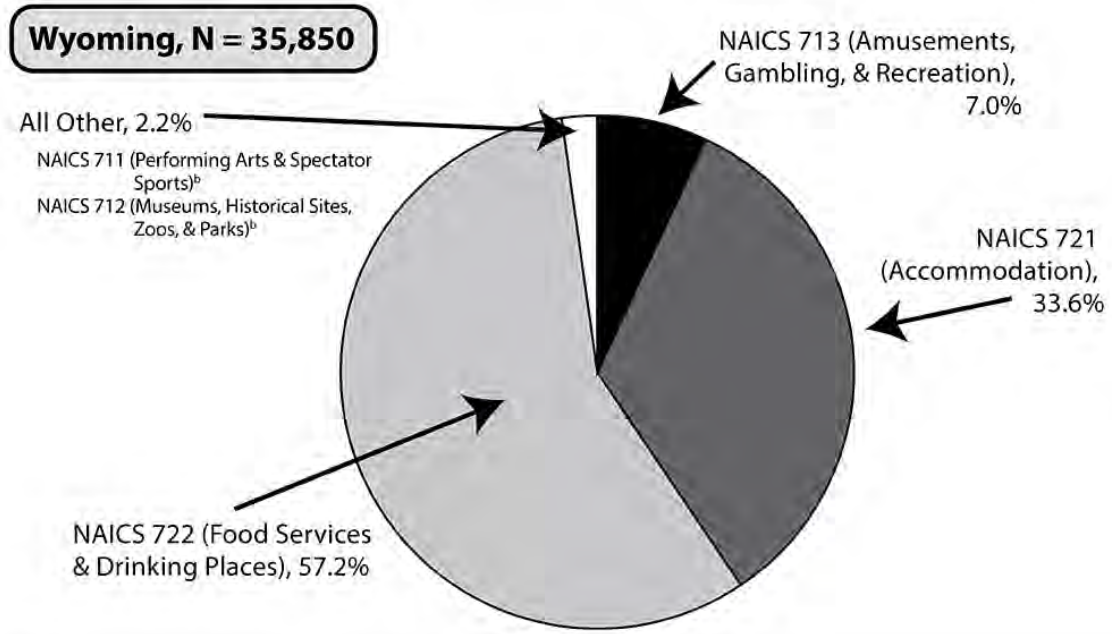
Firms in Wyoming	
Total Firms	2,582
Average Age	9
Number Firms Under 5 Years Old	1,062
Number Firms 5-9 Years Old	558
Number Firms over 10 Years Old	962

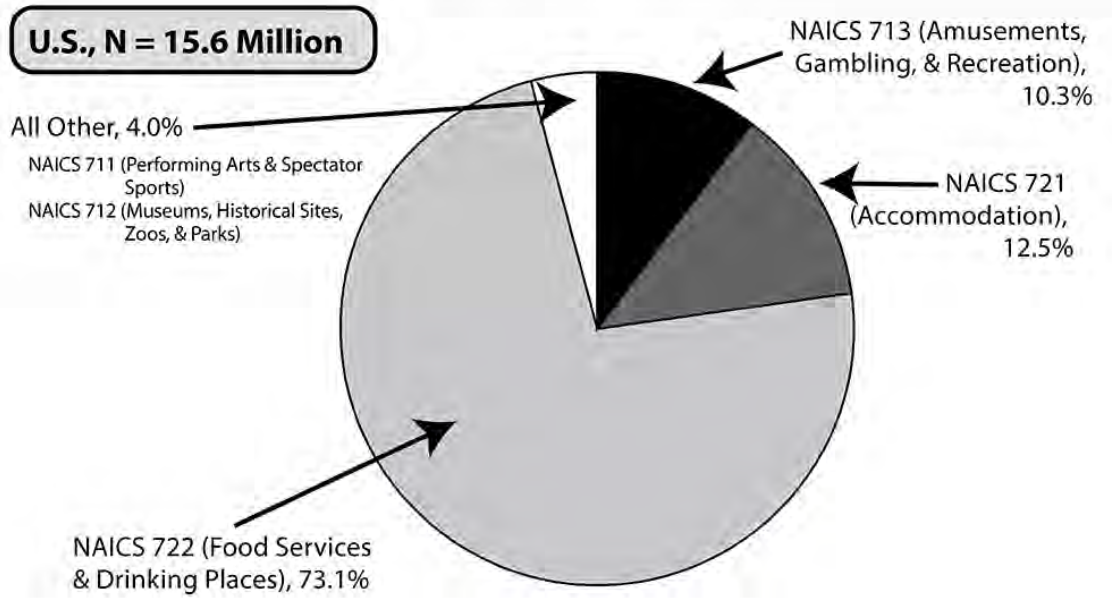
Wyoming and United States Firms, Employees and Annual Wage (2016)

		Wyoming			United States		
NAICS Code	Industry	Firms	Employees	Annual Wages	Firms	Employees	Annual Wages
71-72	Arts, Entertainment, Recreation, Accommodation, and Food Services	2,337	35,850	19,357	819,981	15,556,190	22,431
711	Performing arts and spectator sports	89	0	0	53,420	470,529	87,893
712	Museums, historical sites, zoos, and parks	24	0	0	6,359	157,808	33,910
713	Amusements, gambling, and recreation	306	2,497	19,131	78,534	1,610,064	22,050
721	Accommodation	614	12,044	24,318	68,476	1,943,494	30,203
722	Food services and drinking places	1,305	20,519	16,160	613,191	11,374,296	18,289

NAICS[a] 71-72: Leisure & Hospitality

Distribution of Jobs by 3-Digit NAICS Code in Wyoming and the U.S., 2016 Annual Average





[a]North American Industry Classification System.
[b]NAICS 711 and 712 are not discloseable for Wyoming due to confidentiality.
Source: Quarterly Census of Employment and Wages. U.S. Bureau of Labor Statistics.
Prepared by T. Glover and M. Moore, Research & Planning, WY DWS, 7/21/17.

Workforce

Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	2,356	30,918	$17,390
Colorado	2005	14,420	257,396	$17,038
Idaho	2005	3,994	57,289	$11,812
Montana	2005	4,407	55,192	$11,825
New Mexico	2005	4,220	83,763	$13,100
North Dakota	2005	2,232	31,137	$10,317
South Dakota	2005	2,960	41,632	$10,982
Utah	2005	5,637	104,169	$13,403
Wyoming	2005	2,223	32,039	$13,681
US	2005	691,405	12,739,467	$17,068

State	Year	Firms	Employees	Annual Wage
Alaska	2010	2,388	31,403	$19,781
Colorado	2010	14,408	262,599	$19,705
Idaho	2010	4,225	57,876	$13,806
Montana	2010	4,526	55,475	$14,480
New Mexico	2010	4,593	83,653	$15,627
North Dakota	2010	2,256	34,265	$12,863
South Dakota	2010	3,036	42,999	$13,123
Utah	2010	5,824	110,553	$15,904
Wyoming	2010	2,247	32,623	$16,548
US	2010	744,790	13,006,814	$19,387

State	Year	Firms	Employees	Annual Wage
Alaska	2016	2,528	35,257	$23,319
Colorado	2016	16,141	323,340	$23,451
Idaho	2016	4,720	71,697	$15,796
Montana	2016	4,781	64,330	$17,879
New Mexico	2016	4,895	95,470	$17,502
North Dakota	2016	2,595	39,294	$17,271
South Dakota	2016	3,097	46,732	$16,053
Utah	2016	6,866	138,686	$18,612
Wyoming	2016	2,337	35,850	$19,358
US	2016	819,981	15,556,190	$22,431

Occupations in Leisure and Hospitality

Title	Mean Hourly	Mean Annual	Median Hourly	Median Annual
Total all occupations	$13	$26,202	$11	$21,914
Management Occupations	$31	$64,800	$27	$56,601
Top Executives	$40	$83,380	$31	$63,556
General and Operations Managers	$40	$83,380	$31	$63,556
Advertising, Marketing, Promotions, Public Relations, and Sales Managers	$53	$109,564	$52	$107,302
Operations Specialties Managers	$48	$99,780	$46	$95,834
Financial Managers	$51	$106,122	$49	$102,289
Other Management Occupations	$26	$54,032	$25	$52,145
Food Service Managers	$25	$51,964	$24	$49,084
Lodging Managers	$26	$53,380	$26	$53,263
Managers, All Other	$39	$80,853	$37	$76,426
Business and Financial Operations Occupations	$25	$51,988	$24	$48,975
Business Operations Specialists	$24	$49,538	$23	$46,901
Human Resources Specialists	$29	$59,764	$28	$57,786
Meeting, Convention, and Event Planners	$17	$36,082	$17	$35,279
Market Research Analysts and Marketing Specialists	$24	$49,208	$23	$47,699
Financial Specialists	$28	$58,037	$27	$55,933
Accountants and Auditors	$28	$57,897	$27	$55,229
Computer and Mathematical Occupations	$27	$56,626	$24	$49,886
Computer Specialists	$27	$56,626	$24	$49,886
Network and Computer Systems Administrators	$35	$72,537	$36	$75,877
Computer User Support Specialists	$20	$40,745	$20	$41,445
Education, Training, and Library Occupations	$18	$36,890	$16	$34,288
Other Teachers and Instructors	$17	$35,566	$16	$33,652
Self-Enrichment Education Teachers	$17	$35,566	$16	$33,652
Librarians, Curators, and Archivists	$18	$37,883	$17	$34,935
Curators	$19	$39,623	$15	$32,106
Museum Technicians and Conservators	$17	$35,344	$17	$34,704
Arts, Design, Entertainment, Sports, and Media Occupations	$18	$36,605	$15	$30,195
Art and Design Workers	$16	$33,010	$14	$29,482
Craft Artists	$12	$25,594	$12	$24,741
Entertainers and Performers, Sports and Related Workers	$16	$34,323	$14	$28,851
Producers and Directors	$32	$67,280	$28	$58,327
Coaches and Scouts	NULL	$27,797	NULL	$25,010
Media and Communication Workers	$34	$71,431	$22	$46,043
Healthcare Support Occupations	$9	$19,184	$9	$18,640
Other Healthcare Support Occupations	$9	$19,184	$9	$18,640
Massage Therapists	$9	$19,184	$9	$18,640

Protective Service Occupations	$15	$30,598	$14	$28,763
First-Line Supervisors/Managers, Protective Service Workers	$27	$57,014	$28	$58,542
First-Line Supervisors of Protective Service Workers, All Other	$27	$57,014	$28	$58,542
Other Protective Service Workers	$14	$29,049	$14	$28,216
Security Guards	$14	$28,823	$13	$28,011
Food Preparation and Serving-Related Occupations	$11	$23,345	$10	$19,936
Supervisors, Food Preparation and Serving Workers	$17	$35,262	$15	$31,724
Chefs and Head Cooks	$24	$48,879	$22	$45,820
First-Line Supervisors of Food Preparation and Serving Workers	$16	$33,111	$14	$29,565
Cooks and Food Preparation Workers	$12	$24,560	$11	$23,072
Cooks, Fast Food	$10	$20,279	$10	$19,863
Cooks, Institution and Cafeteria	$13	$26,189	$12	$24,282
Cooks, Restaurant	$13	$26,549	$12	$25,486
Cooks, Short Order	$10	$21,490	$10	$20,045
Food Preparation Workers	$11	$22,000	$10	$20,720
Food and Beverage Serving Workers	$10	$21,097	$9	$18,816
Bartenders	$11	$21,929	$9	$19,050
Combined Food Preparation and Serving Workers, Including Fast Food	$9	$19,356	$9	$18,840
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	$9	$18,988	$9	$18,516
Waiters and Waitresses	$11	$22,335	$9	$18,763
Food Servers, Nonrestaurant	$10	$21,418	$9	$19,576
Other Food Preparation and Serving Related Workers	$10	$21,467	$10	$19,955
Dining Room and Cafeteria Attendants and Bartender Helpers	$10	$20,795	$9	$19,056
Dishwashers	$10	$21,294	$10	$20,258
Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	$10	$21,775	$10	$20,323
Building and Grounds Cleaning and Maintenance Occupations	$11	$23,402	$11	$22,072
Supervisors, Building and Grounds Cleaning and Maintenance Workers	$18	$36,630	$16	$33,302
First-Line Supervisors of Housekeeping and Janitorial Workers	$17	$34,512	$15	$31,625
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping	$24	$50,139	$23	$47,039
Building Cleaning and Pest Control Workers	$11	$21,953	$10	$21,421
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$12	$25,287	$11	$23,821
Maids and Housekeeping Cleaners	$10	$21,551	$10	$21,167
Grounds Maintenance Workers	$12	$25,739	$11	$23,695

Landscaping and Groundskeeping Workers	$13	$26,270	$12	$24,100
Personal Care and Service Occupations	$14	$29,482	$13	$26,338
Supervisors, Personal Care and Service Workers	$22	$45,580	$22	$45,295
First-Line Supervisors of Personal Service Workers	$21	$43,280	$20	$42,572
Entertainment Attendants and Related Workers	$11	$22,406	$9	$19,507
Amusement and Recreation Attendants	$11	$23,338	$10	$20,655
Transportation, Tourism, and Lodging Attendants	$13	$27,656	$12	$25,528
Baggage Porters and Bellhops	$11	$23,122	$11	$22,893
Concierges	$16	$33,463	$16	$32,493
Tour Guides and Escorts	$19	$38,715	$18	$37,586
Other Personal Care and Service Workers	$14	$29,765	$14	$29,458
Childcare Workers	$15	$30,424	$16	$32,638
Fitness Trainers and Aerobics Instructors	$16	$33,575	$17	$35,259
Recreation Workers	$12	$23,986	$10	$19,973
Sales and Related Occupations	$12	$25,073	$11	$22,061
Supervisors, Sales Workers	$22	$46,029	$22	$46,280
First-Line Supervisors of Retail Sales Workers	$21	$44,267	$22	$44,986
Retail Sales Workers	$11	$22,190	$10	$21,257
Cashiers	$11	$22,442	$10	$21,645
Counter and Rental Clerks	$9	$18,820	$9	$18,667
Retail Salespersons	$10	$21,353	$10	$19,969
Sales Representatives, Services	$29	$59,280	$24	$50,436
Sales Representatives, Services, All Other	$29	$59,280	$24	$50,436
Office and Administrative Support Occupations	$14	$28,305	$13	$26,367
Supervisors, Office and Administrative Support Workers	$20	$41,125	$19	$39,484
First-Line Supervisors of Office and Administrative Support Worke	$20	$41,125	$19	$39,484
Financial Clerks	$16	$34,180	$16	$33,645
Bookkeeping, Accounting, and Auditing Clerks	$16	$34,016	$16	$33,269
Information and Record Clerks	$12	$24,863	$12	$24,184
Customer Service Representatives	$15	$30,891	$14	$29,302
Hotel, Motel, and Resort Desk Clerks	$12	$24,276	$12	$23,931
Human Resources Assistants, Except Payroll and Timekeeping	$17	$35,427	$17	$35,970
Receptionists and Information Clerks	$12	$25,796	$11	$23,896
Reservation and Transportation Ticket Agents and Travel Clerks	$19	$40,017	$17	$35,697
Material Recording, Scheduling, Dispatching, and Distributing Workers	$14	$29,740	$14	$28,375
Stock Clerks and Order Fillers	$14	$28,288	$11	$23,678
Secretaries and Administrative Assistants	$16	$33,940	$16	$33,736
Secretaries and Administrative Assistants, Except Legal, Medical,	$16	$33,290	$16	$33,049
Other Office and Administrative Support Workers	$15	$31,189	$15	$31,134

Office Clerks, General	$15	$30,470	$14	$29,896
Farming, Fishing, and Forestry Occupations	$17	$34,663	$17	$34,832
Agricultural Workers	$16	$33,980	$17	$34,556
Farmworkers, Farm, Ranch, and Aquacultural Animals	$16	$33,980	$17	$34,556
Construction and Extraction Occupations	$22	$44,869	$21	$42,667
Construction Trades Workers	$21	$43,163	$21	$42,667
Electricians	$25	$52,018	$26	$53,938
Installation, Maintenance, and Repair Occupations	$17	$34,420	$16	$32,405
Supervisors of Installation, Maintenance, and Repair Workers	$30	$61,384	$29	$61,024
First-Line Supervisors of Mechanics, Installers, and Repairers	$30	$61,384	$29	$61,024
Other Installation, Maintenance, and Repair Occupations	$15	$31,386	$15	$30,296
Maintenance and Repair Workers, General	$15	$30,787	$14	$29,206
Production Occupations	$12	$25,885	$12	$24,045
Food Processing Workers	$13	$27,738	$13	$26,478
Bakers	$14	$28,610	$13	$26,609
Textile, Apparel, and Furnishings Workers	$11	$23,225	$11	$22,963
Laundry and Dry-Cleaning Workers	$11	$23,136	$11	$22,936
Transportation and Material Moving Occupations	$10	$21,655	$9	$19,286
Motor Vehicle Operators	$10	$20,642	$9	$18,999
Driver/Sales Workers	$10	$20,595	$9	$18,937
Taxi Drivers and Chauffeurs	$11	$22,486	$11	$22,601
Material Moving Workers	$17	$35,901	$17	$34,855
Laborers and Freight, Stock, and Material Movers, Hand	$17	$35,901	$17	$34,855

Export

Export dollars are captured in the "How Does Wyoming Compare" section

> *Inbound tourism. Travel-related expenditures by non-residents traveling within the United States and expenditures by nonresidents purchased from U.S. providers. Travel is the largest service export economy of the US. Wyoming Office of Tourism*

Asset Maps

A baseline for delineating Business Development and Innovation Zones

Tourism and the Arts have been identified as important opportunities within the Leisure and Hospitality sector.

Areas characterized by assets shown below, sites within these areas, areas characterized by one or more input assets (e.g. workforce), or intersections amongst sectors may be considered potential business development and innovation zones. More focused analyses will be presented in the report submitted to the Legislature and Governor before December 31st, 2017.

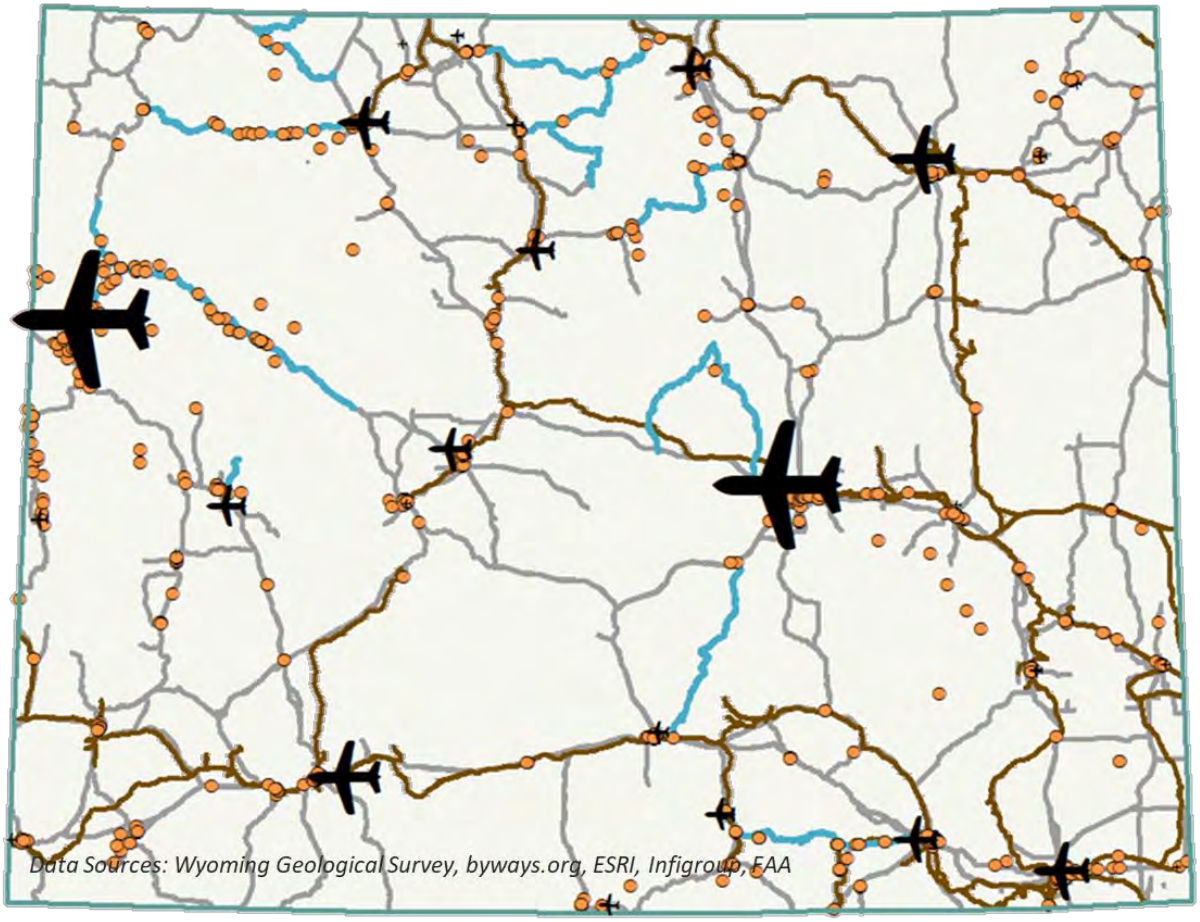
Tourism

Mappable Sector Assets

Infrastructure	Amenities

• Transportation
  • Road
  • Air
• Accomodations
	• Authentic experiences
	  • Restaurants
	  • Shopping
	  • Outdoor Amenities
	  • Other Amenities

Transportation Infrastructure



Railroads

Highways

Scenic Byways

Airports

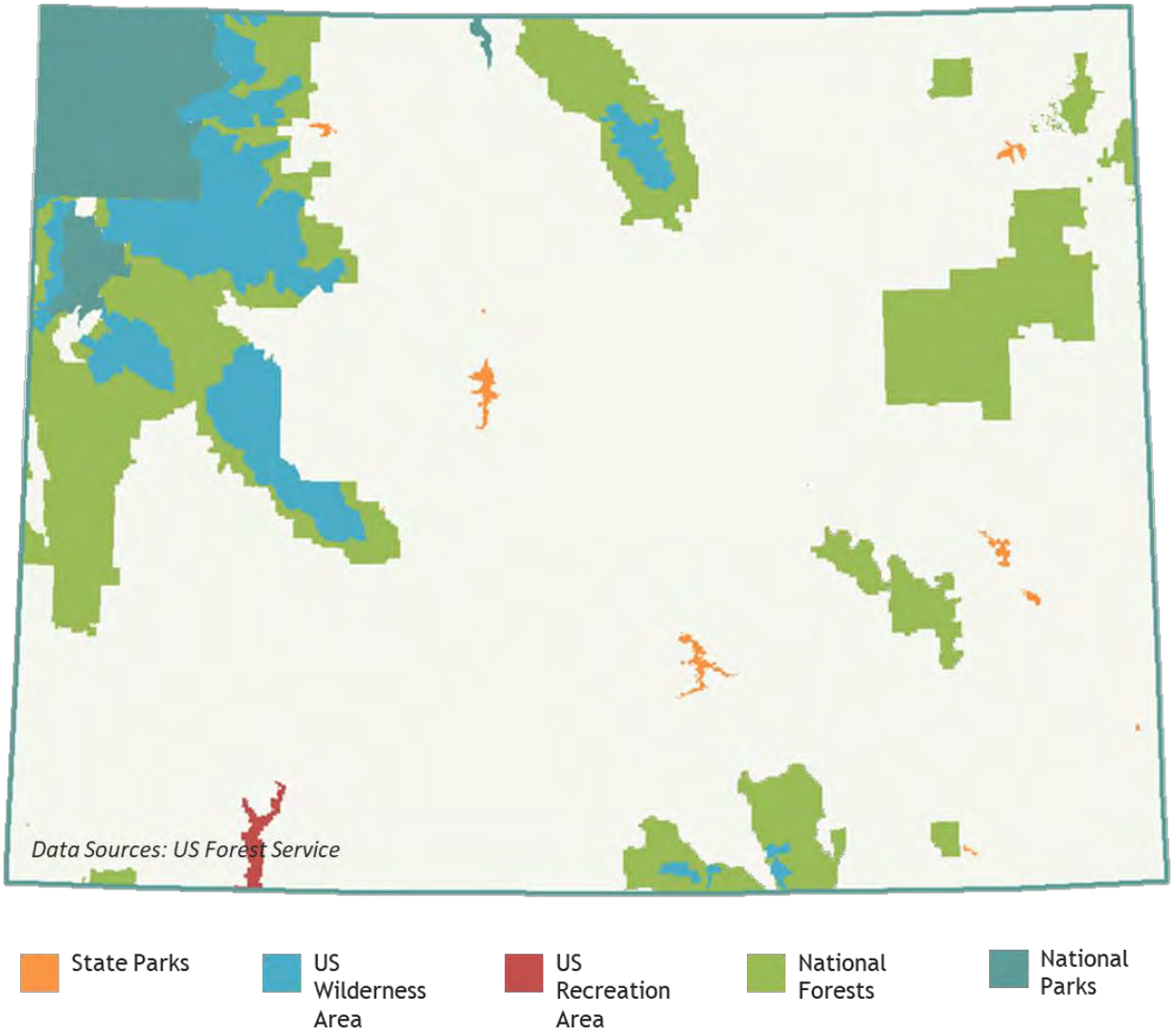
commercial, taxi, and commuter operations per week

1 10 100

Accommodations

Amenities

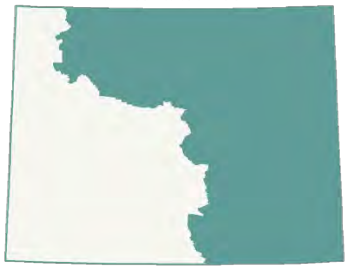
Wyoming boasts a plethora of authentic experiences, recreation opportunities, and amenities. Some are shown below.



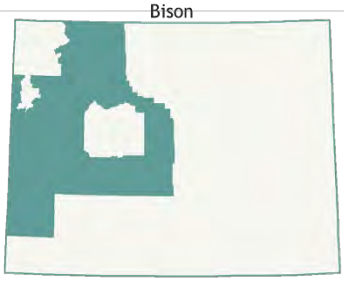
Black Bear

Mule Deer

White Tailed Deer

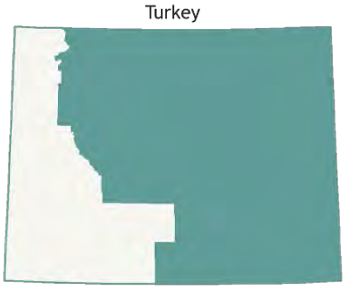


Bison



Mountain Lion

Turkey



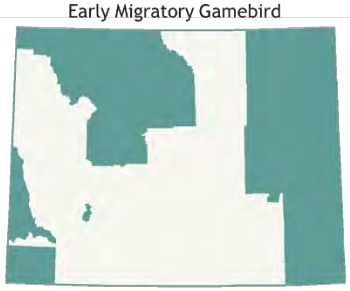
Bighorn Sheep

Elk

Sage Grouse

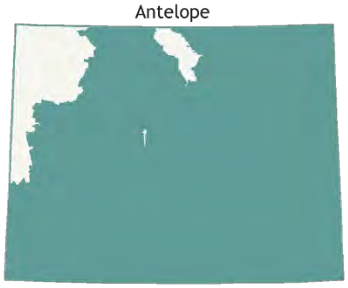
Pheasant

Early Migratory Gamebird



Rocky Mountain Goat

Antelope

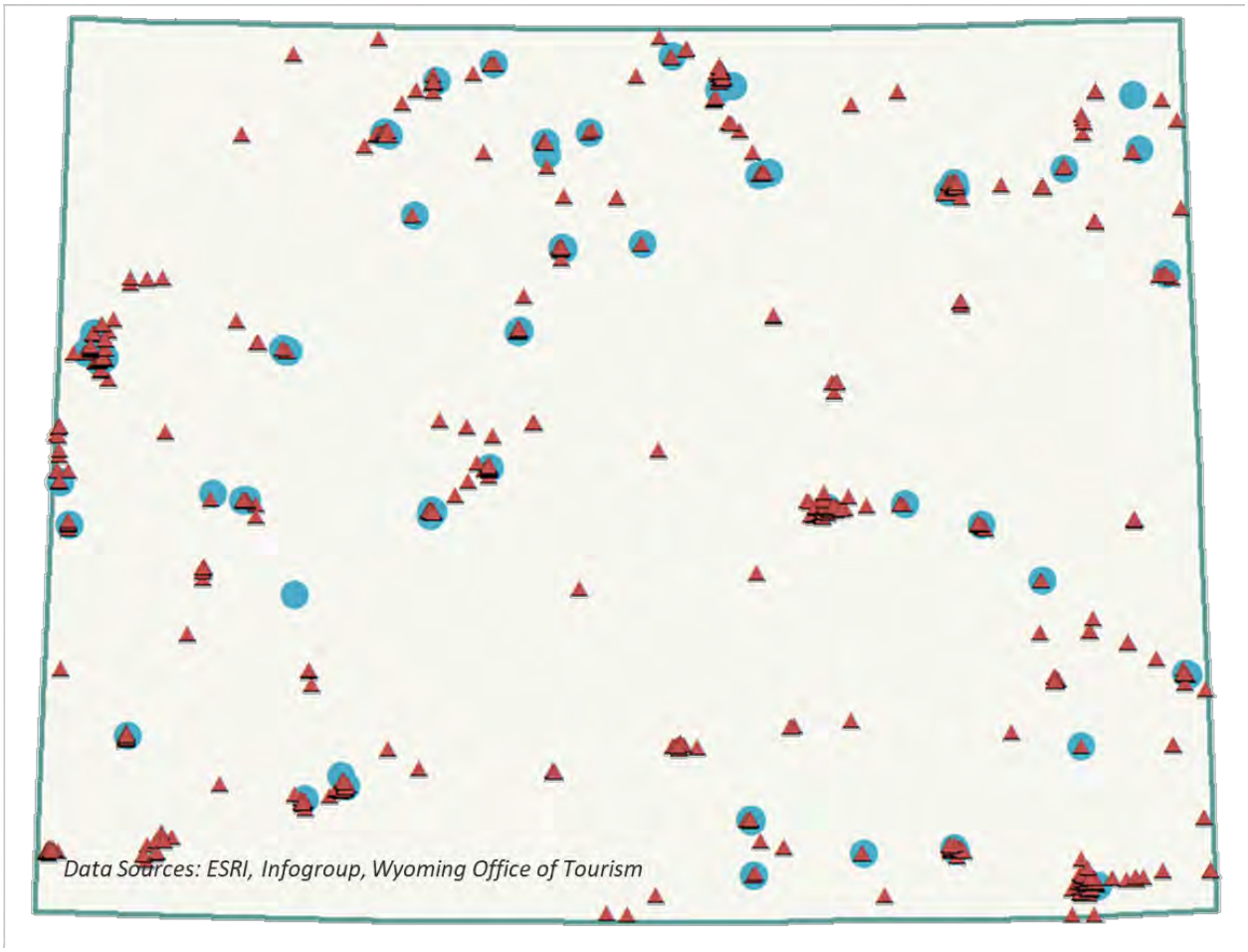


Blue Ribbon Streams

Blue Ribbon Streams

Wyoming Game and Fish Hunting Area

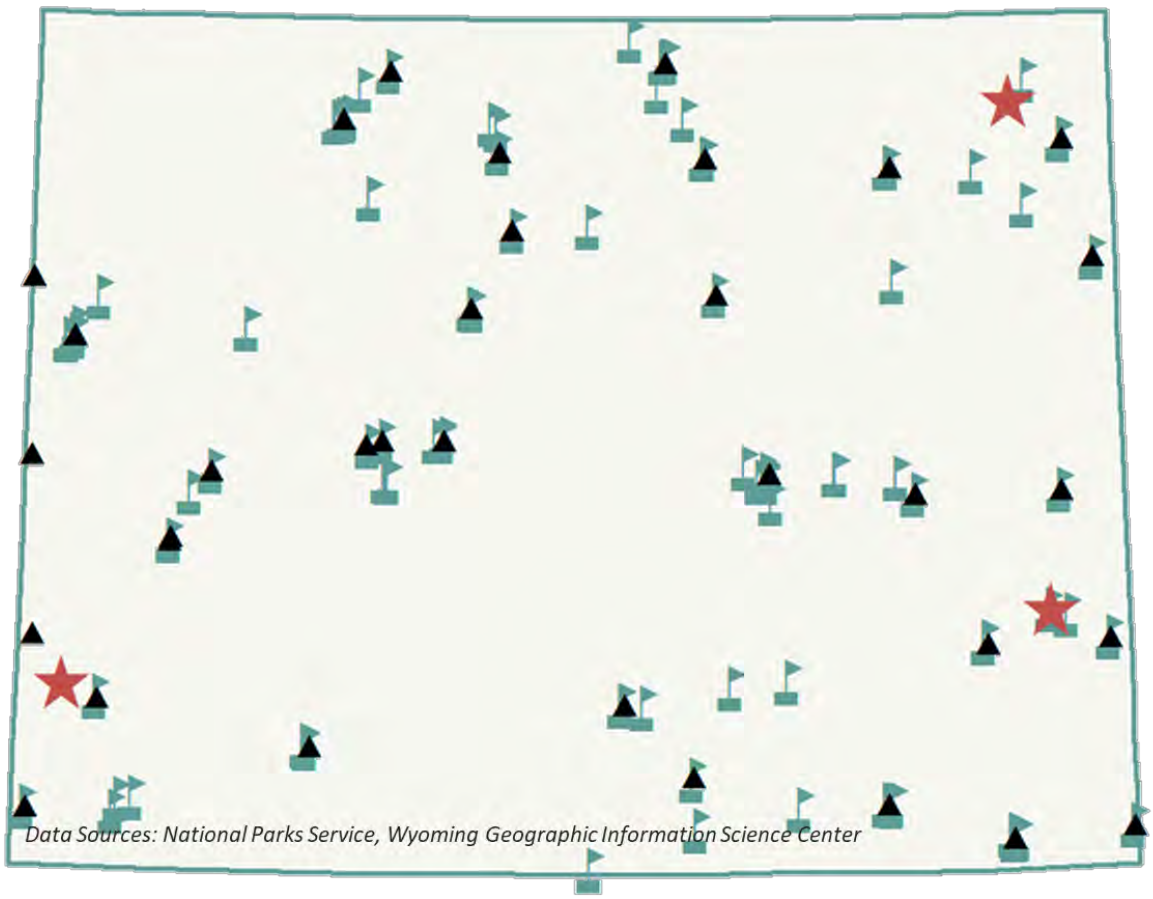
Data Source: Wyoming Game and Fish



Restaurants

Shopping

Wyoming Office of Tourism Business Partners



Asset Mapping Conclusions

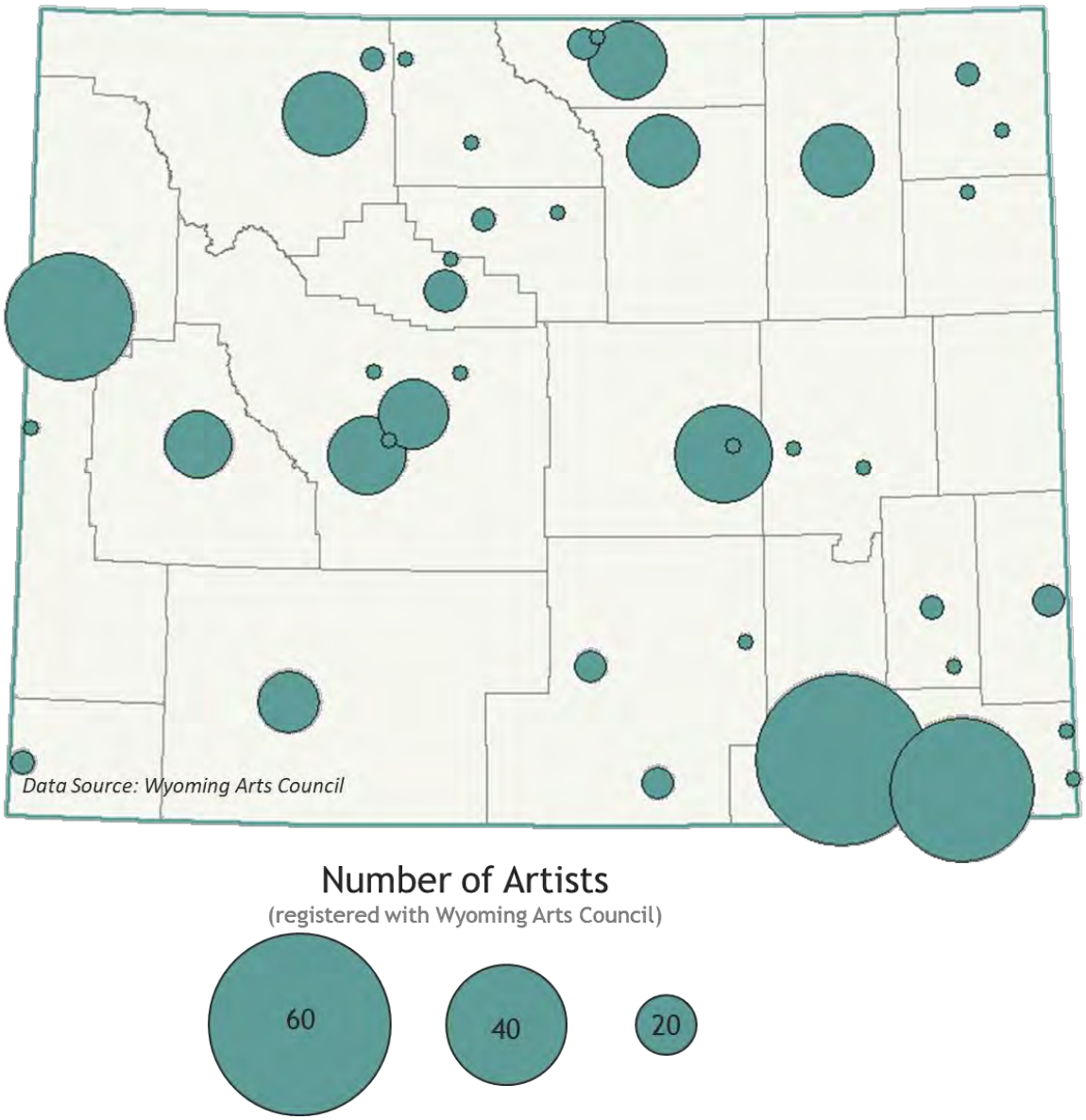
Tourism

Wyoming's rich and diverse landscape of recreation opportunities and amenities, along with transportation and accommodation infrastructure, are important enablers to the tourism industry.

Important crossovers amongst this sector and others could help to diversify Wyoming's economy while leveraging our rich and diverse cultural and recreational opportunities.

Arts

Artist Clusters



Asset Mapping Conclusions

Arts

Artists are an important part of communities across Wyoming.

Important crossovers amongst this sector and others—e.g. Professional and Business Services, Retail Trade, Manufacturing—present opportunities to diversify Wyoming's economy while leveraging our arts and artists.

Enablers

Leisure & Hospitality
Enablers
Low sales taxes
Wyoming Arts Council
Wyoming Humanities Council
Strong tourism market brings new money into economy
Wyoming's outdoor lifestyle and livability
World class recreation attractions
Wyoming Women's Business Center
Wyoming Restaurant and Lodging Association
Incentives
BRC - Community Enhancement Grants
Challenge Loan
Wyoming Women's Business Center - Microloan Program
Wyoming Arts Council - grants
Wyoming Humanities Council grants
Main Street Program
Main Street Technical Assistance grants
Challenges
Unskilled, entry-level workforce
Uncertain future land-use and access at federal level

Industry Input:

Evidence economic value of outfitted hunters. In 2016, WYOGA contracted with Southwick Associates, one of the nation's leading outdoor research and economics firms to produce this study on how important big game hunting is to the state's economy. Using surveys of Wyoming's licensed resident and nonresident big game hunters, combined with economic models specific to Wyoming's economy, economic insights were generated for all big game hunters combined, along with breakouts for residents, guided nonresidents and unguided nonresident big game hunters. The economic study hunting overview was big game hunters spent over $303.6 million

annually to hunt the state of Wyoming. This study cost WYOGA over $41,000 to produce.

-Wyoming Outfitters & Guides Association

Obstacles

Industry Input:

Stable and consistent access to big game hunting licenses. If we could fix this, our industry could double in five years.

-Wyoming Outfitters & Guides Association

One of the largest obstacles to economic diversity in the state is the lack of available and sustainable air service.

-Pete Illoway

Opportunities

Tourism

Art

New Potential Hunting Markets: Wolves and Grizzly Bears (Grizzly in appeals process)

Take advantage of what we already have. Lots of animals, open spaces, quality outfitting industry. We need stable licensing.

-Wyoming Outfitters & Guides Association

Other Services (81)

How does Wyoming compare?

Percentage Other Services Contributes to Total GDP (2016)		
Real GDP (millions of chained 2009 dollars)		
	Other Services GDP	**% of Total GDP**
Wyoming	$507	1.5%
Alaska	$766	1.6%
Colorado	$6,313	2.2%
Idaho	$1,168	2.0%
Montana	$883	2.2%
New Mexico	$1,717	2.0%
North Dakota	$823	1.7%
South Dakota	$868	2.1%
Utah	$3,614	2.7%
United States	$345,541	2.1%

Source: Bureau of Economic Analysis

Percentage Other Services Contributes to Total Employment		
2016		
	Other Services Employment	**% of Total Employment**
Wyoming	7,288	2.7%
Alaska	9,917	3.0%
Colorado	79,034	3.1%
Idaho	17,325	2.5%
Montana	17,516	3.9%
New Mexico	20,449	2.5%
North Dakota	12,078	2.9%
South Dakota	10,919	2.6%
Utah	34,405	2.5%
United States	4,385,876	3.1%

Source: Bureau of Labor Statistics

Workforce

Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	1,587	9,316	$28,331
Colorado	2005	12,396	65,118	$28,758
Idaho	2005	3,174	14,889	$21,444
Montana	2005	3,295	15,700	$21,182
New Mexico	2005	3,981	21,362	$23,343
North Dakota	2005	1,911	11,233	$19,441
South Dakota	2005	2,079	10,238	$20,866
Utah	2005	5,946	28,305	$23,130
Wyoming	2005	1,644	7,565	$23,379
US	2005	1,102,054	4,324,015	$25,883

State	Year	Firms	Employees	Annual Wage
Alaska	2010	1,658	10,106	$33,768
Colorado	2010	12,539	65,277	$33,219
Idaho	2010	3,409	15,303	$24,190
Montana	2010	3,370	15,843	$23,824
New Mexico	2010	4,010	20,918	$27,556
North Dakota	2010	1,863	11,351	$24,005
South Dakota	2010	2,101	10,284	$25,186
Utah	2010	6,596	31,060	$25,777
Wyoming	2010	1,724	7,926	$34,217
US	2010	1,256,344	4,349,563	$29,369

State	Year	Firms	Employees	Annual Wage
Alaska	2016	1,727	9,917	$38,632
Colorado	2016	15,155	78,034	$38,203
Idaho	2016	3,725	17,325	$28,551
Montana	2016	3,787	17,516	$28,232
New Mexico	2016	4,027	20,449	$30,881
North Dakota	2016	2,061	12,078	$32,871
South Dakota	2016	2,166	10,919	$30,249
Utah	2016	5,985	34,405	$33,511
Wyoming	2016	1,681	7,288	$34,505
US	2016	833,053	4,385,876	$35,922

Public Administration (91)

How does Wyoming compare?

Percentage Public Administration Contributes to Total GDP (2016)

Real GDP (millions of chained 2009 dollars)

	Public Administration GDP	% of Total GDP
Wyoming	$5,378	15.6%
Alaska	$9,206	19.4%
Colorado	$34,450	11.8%
Idaho	$7,669	12.8%
Montana	$6,000	14.6%
New Mexico	$19,372	22.5%
North Dakota	$5,077	10.7%
South Dakota	$4,798	11.5%
Utah	$17,294	12.7%
United States	$1,961,369	12.0%

Source: Bureau of Economic Analysis

Percentage Public Administration Contributes to Total Employment

2016

	Public Administration Employment	% of Total Employment
Wyoming	23,667	8.7%
Alaska	41,023	12.6%
Colorado	146,382	5.7%
Idaho	43,678	6.3%
Montana	37,647	8.3%
New Mexico	61,689	7.6%
North Dakota	22,679	5.4%
South Dakota	26,879	6.4%
Utah	76,835	5.5%
United States	7,307,643	5.2%

Source: Bureau of Labor Statistics

Workforce

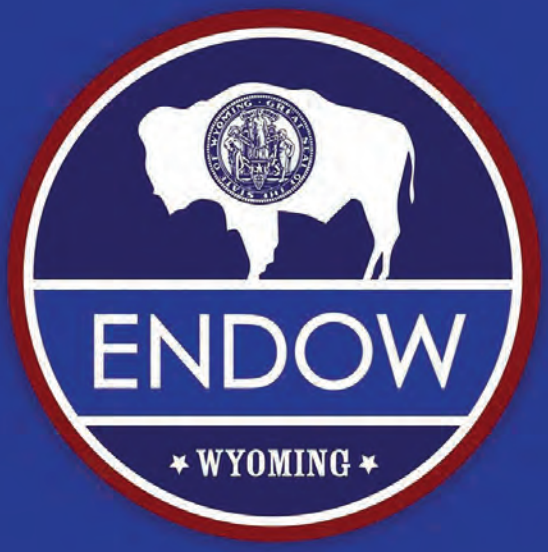
Source: Bureau of Labor Statistics, U.S. Department of Labor

Wyoming and Comparator States

State	Year	Firms	Employees	Annual Wage
Alaska	2005	1,587	49,084	$47,099
Colorado	2005	2,661	199,712	$46,604
Idaho	2005	2,062	70,618	$35,209
Montana	2005	1,871	53,002	$36,931
New Mexico	2005	2,886	122,331	$39,642
North Dakota	2005	1,642	34,043	$34,134
South Dakota	2005	1,972	43,818	$33,732
Utah	2005	2,439	128,646	$39,716
Wyoming	2005	1,288	34,288	$37,814
US	2005	217,087	13,336,919	$44,805

State	Year	Firms	Employees	Annual Wage
Alaska	2010	1,855	56,750	$54,416
Colorado	2010	3,141	213,028	$53,610
Idaho	2010	2,083	71,311	$40,484
Montana	2010	1,769	55,699	$43,079
New Mexico	2010	3,269	130,221	$47,010
North Dakota	2010	2,021	40,606	$39,746
South Dakota	2010	2,241	46,292	$39,367
Utah	2010	2,567	131,875	$47,242
Wyoming	2010	1,401	38,648	$46,059
US	2010	234,774	13,823,892	$52,096

State	Year	Firms	Employees	Annual Wage
Alaska	2016	1,925	53,892	$61,598
Colorado	2016	3,068	265,781	$61,147
Idaho	2016	1,962	72,482	$45,942
Montana	2016	1,707	58,187	$49,168
New Mexico	2016	3,640	129,389	$51,954
North Dakota	2016	1,866	42,117	$51,914
South Dakota	2016	2,211	46,463	$45,112
Utah	2016	2,514	144,120	$51,969
Wyoming	2016	1,370	37,615	$52,396
US	2016	232,989	13,648,917	$59,195



Appendix 2:
Wyoming County Profiles, 2016

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