moffatt & nichol

Great Falls Region Freight Market Assessment

Prepared for:

Great Falls DEVELOPMENT ALLIANCE

MONTANA ECONOMIC DEVELOPMENT CDFI

July 2024

Executive Summary and Key Takeaways

BNSF runs through Great Falls and is a key partner in the region's development strategy

- BNSF passes through Great Falls, connecting the city to the Pacific Northwest, Canada, the Plains, the Great Lakes, the Midwest and Texas. Successfully incorporating BNSF is an essential component to an effective economic strategy for the region.
- Great Falls does not sit on any intermodal rail networks, including the BNSF intermodal network. The nearest intermodal facilities are in Spokane (BNSF) and the Canadian cities of Regina and Calgary (Canadian Pacific Kansas City, CPKC)
- Great Falls is connected by rail and road (Interstate 15) to Montana's largest border crossing with Canada: Sweetgrass.
- The region's transport-based economic strategy must look comprehensively at the robustness of both its road and rail networks to help identify potential new industries that might benefit from the networks' reach. As investors' needs vary, the strategy must consider all potential cargo configurations and freight movements including rail-direct, truckload, containerized, reefer and multimodal transload. Where the region "sits" on each network should suggest specific opportunity targets.
- Assessing its network location and identification of appropriate sites on which to land new, transportation-dependent prospects is key to a successful economic development strategy. (Phase II of this current analysis will include a review of the latter element.)

East-West flowing bulk commodities that originate in or are destined to Montana tend to use rail or multiple transport modes

- Agriculture is the largest non-energy commodity originating in or destined to Montana using multiple transport modes. Multiple agriculture transload facilities connect Montana's farms to maritime ports near Portland (Vancouver, WA) via BNSF.
- According to Freight Analysis Framework [FAF] and the Montana Department of Transportation 2022 Freight Plan, most Montana agriculture trade with overseas markets moves through ports in Washington.
- Goods transported out of Montana tend to rely more on rail and multiple modes for transport.
- Other non-energy goods transported in and out of Montana on rail or multiple modes include wood products, other foodstuffs (food products, oils, sugars), chemicals, minerals and metals.
- Most goods transported on rail and multiple modes are flowing East-West between Montana and the Great Lakes or PNW regions.

Great Falls connects to the growing Sweetgrass international port of entry on the Canadian border

- Sweetgrass is the largest port of entry on the Montana-Canada border and the state's only international rail crossing. BNSF and CPKC connect at the Sweetgrass port of entry.
- A high share of the goods traded between Canada and states in the Mountain / Upper Southwest region (Wyoming, Colorado, Utah) pass through Montana, reflecting Montana's North-South rail and road connectivity to these regions.
- Montana imports agriculture-related, wood, metal and non-metallic mineral products from Canada through its ports of entry. Montana markets do not account for all the imported freight. Additionally, the state does not generate a significant share of the exports to Canada that pass through Montana ports of entry.
- According to FAF and the Montana Department of Transportation 2022 Freight Plan, Canada is by far Montana's largest export market by value, followed by East Asia, Europe and Mexico. Montana trades with overseas markets via ports in Texas, Washington and New Jersey, reflecting the state's connections to several maritime ports.
- The number of crossings through Montana ports of entry by truck loads (full and empty) and railcars (loaded and empty) has increased at an annual rate of 5.9% since 2015, reflecting more use of the ports of entry.

Executive Summary and Key Takeaways

Great Falls is surrounded by Montana's robust agriculture sector. Notably, Great Falls does not have processed food manufacturing on the scale of neighboring states

- Great Falls is surrounded by Montana's robust crop (wheat, barley, oats, peas, flaxseed) and animal agriculture sectors. These sectors generate considerable inbound and outbound freight including grains, animal feed, fertilizers, pesticides and food products. .
- Outbound cereal grains, fertilizers and other foodstuffs (food products, oils, sugars) use truck, rail and multiple transport modes while other agriculture products, such as animal feed, livestock and meat products, tend to use truck.
- Currently, Montana is predominately engaged at the early stages of the food supply chain. Grain milling, oilseed crush, pasta manufacturing and meat processing occur but processed food product manufacturing that combines these inputs does not happen on the scale of neighboring states such as Idaho or Washington.
- Food product manufacturing may generate freight with a wider variety of transport requirements, including bulk grains, vegetable oil, chemical products and refrigerated containers.

Fabricated metal manufacturers in Great Falls use truck and rail, but some firms do not have direct rail connections

- Great Falls has several fabricated metal manufacturing firms operating on the BNSF rail line.
- Metal products generate inbound and outbound freight using multiple transport modes. ADF International, one of the largest structural metal manufacturers in Great Falls, does not have a direct rail spur at its facility.
- Montana does not produce primary steel or aluminum products. These firms must transport production inputs to Montana.

Other freight-generating industries in Montana include mining and wood products. These industries are not as active in Great Falls

- Montana has non-metallic and metallic mining operations, particularly in western Montana. Output ranges from construction materials such as limestone and gravel to metals such as copper and platinum.
- Outbound construction materials use truck, rail and multiple modes but at short distances.
- Great Falls does not have metal mines generating freight through the area.
- Montana's lumber and wood product industries have been in decline over the last decade. Both industries concentrate in western Montana and are not particularly active in Great Falls.
- Wood products move in and out of Montana using truck, rail and multiple modes, including through Montana's ports of entry.

Rail Connectivity and Multimodal Facilities

Two Class 1 railroads pass through Montana: BNSF and UP. Multimodal facilities on the BNSF line primarily cater to agriculture transloading. Four facilities in Montana provide rail-to-truck transloading for other bulk commodities.

MONTANA CLASS I RAIL NETWORK AND BULK MULTIMODAL FACILITIES

Sources: Montana Department of Transportation

Rail Connectivity and Intermodal Facilities

Great Falls does not sit on BNSF's intermodal rail network.

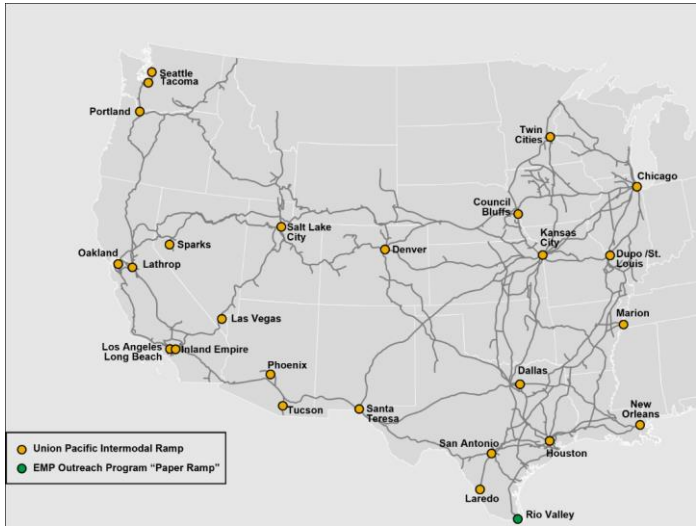
BNSF INTERMODAL RAIL NETWORK

Sources: BNSF

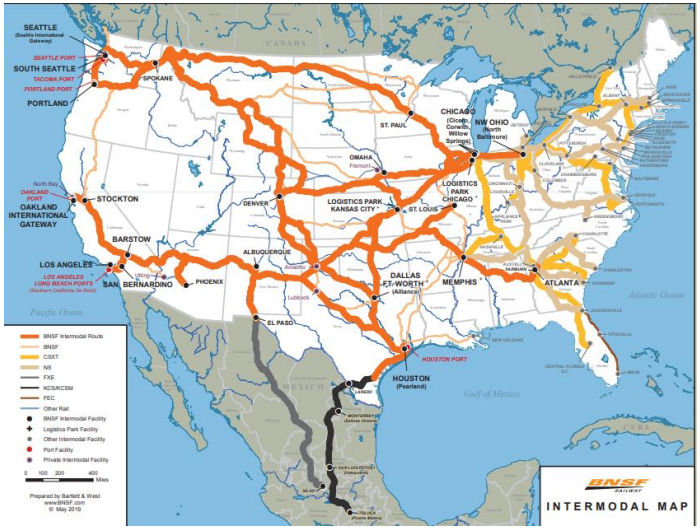
Existing Intermodal Footprint

Montana, North Dakota, South Dakota, Wyoming and Idaho do not have an intermodal facility. These states form an intermodal "desert" with facilities operating in surrounding cities such as Spokane, Calgary, Regina, and Denver.

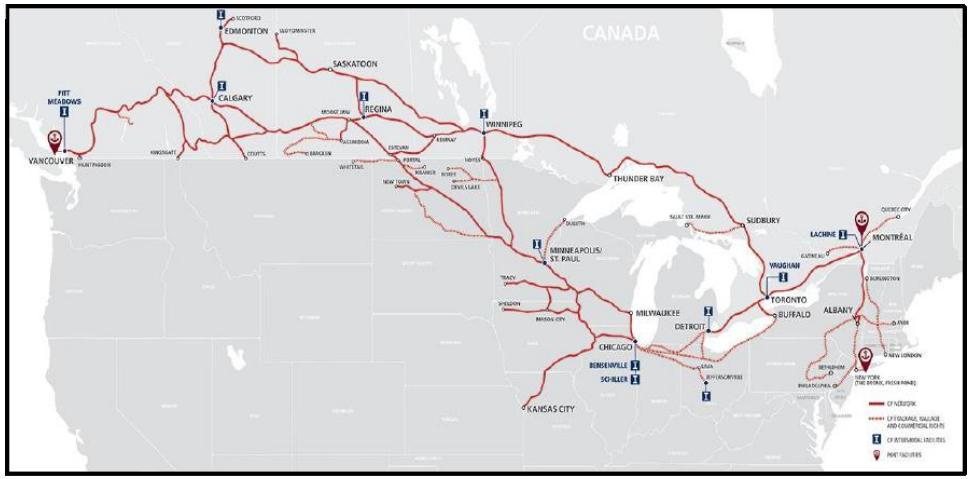
UNION PACIFIC INTERMODAL NETWORK



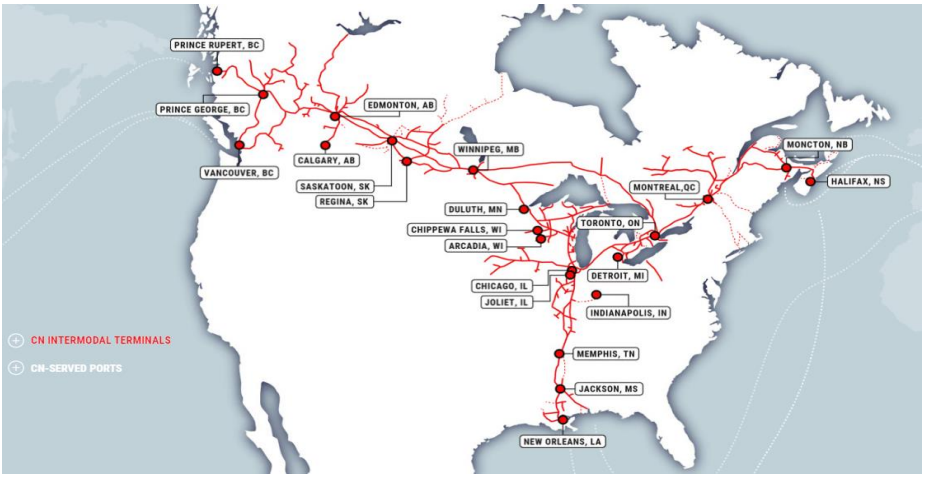
BNSF INTERMODAL NETWORK



CANADIAN PACIFIC WHOLE NETWORK WITH INTERMODAL FACILITIES HIGHLIGHTED



CANADIAN NATIONAL WHOLE NETWORK WITH INTERMODAL FACILITIES HIGHLIGHTED



Sources: Union Pacific, BNSF, CPKC, Canadian National

Rail Connectivity to the US and Canada

The BNSF and Union Pacific connect Montana to the Midwestern and Western US, Canada, and maritime ports in Portland, Vancouver (USA) and Seattle.

BNSF connects Montana to port cities in the Pacific Northwest such as Portland, Seattle and Vancouver (Canada)

Great Falls lies 500 miles from Seattle (straight line).

Portland and Vancouver (Canada) are slightly farther (straight line) but also create opportunities for rail to maritime port shipments.

At this distance, rail is likely competitive against trucking.

BNSF connects to CPKC in Montana

Sweetgrass is a major border crossing and international trade thoroughfare.

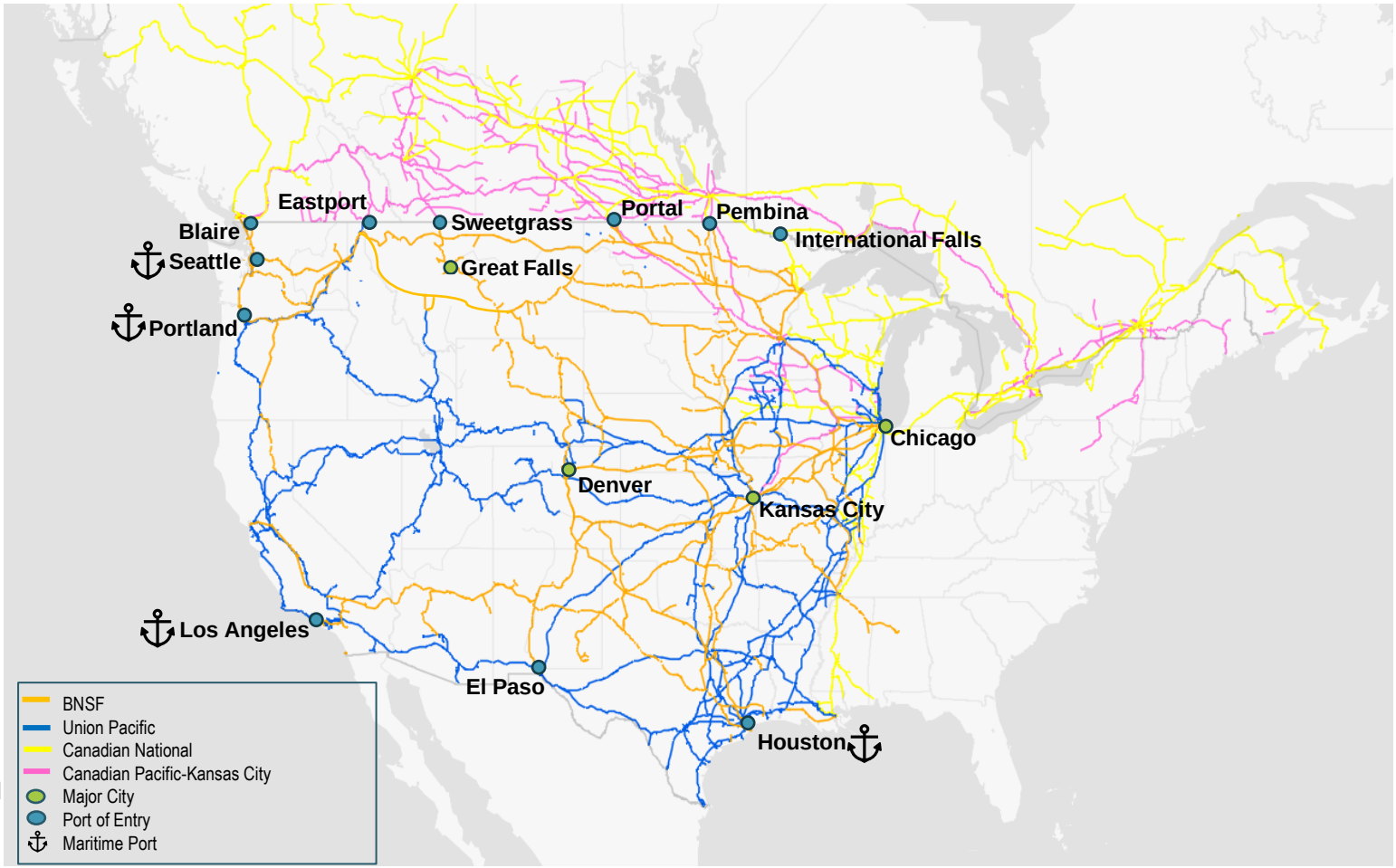
BNSF connects with CPKC, providing access to North American markets for not just Montana, but also other nearby states and Canadian provinces.

BNSF and UP connect to the Mountain, Southwest, Gulf and Midwest regions, including population centers such as Denver, Chicago, Houston and Albuquerque.

Rail connections to the Lower Mountain region and Texas create freight flows to and from Canada through Montana.

Montana connects to population centers such as Denver, Albuquerque, El Paso and Houston via the BNSF.

WESTERN US CLASS I RAIL NETWORK

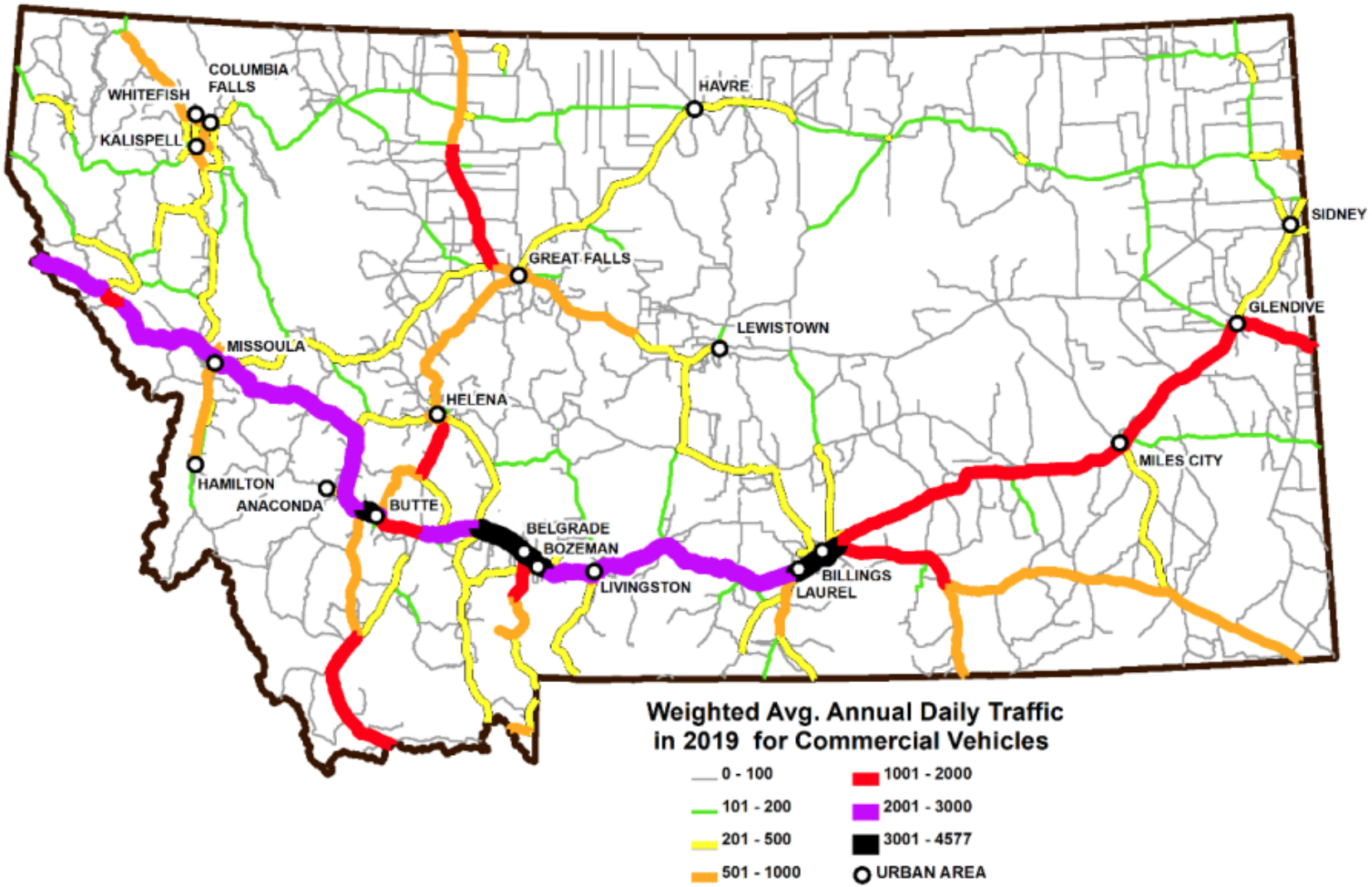


Sources: Arc GIS

Highway System

I-90, the most used interstate for Montana freight, runs East-West through several of the state's population centers and connects to Washington, Wyoming, North Dakota and the Great Plains. I-15 runs North-South through Great Falls and connects to Sweetgrass, the state's primary port of entry on the Canadian border.

MONTANA COMMERCIAL TRUCK TRAFFIC (2019)

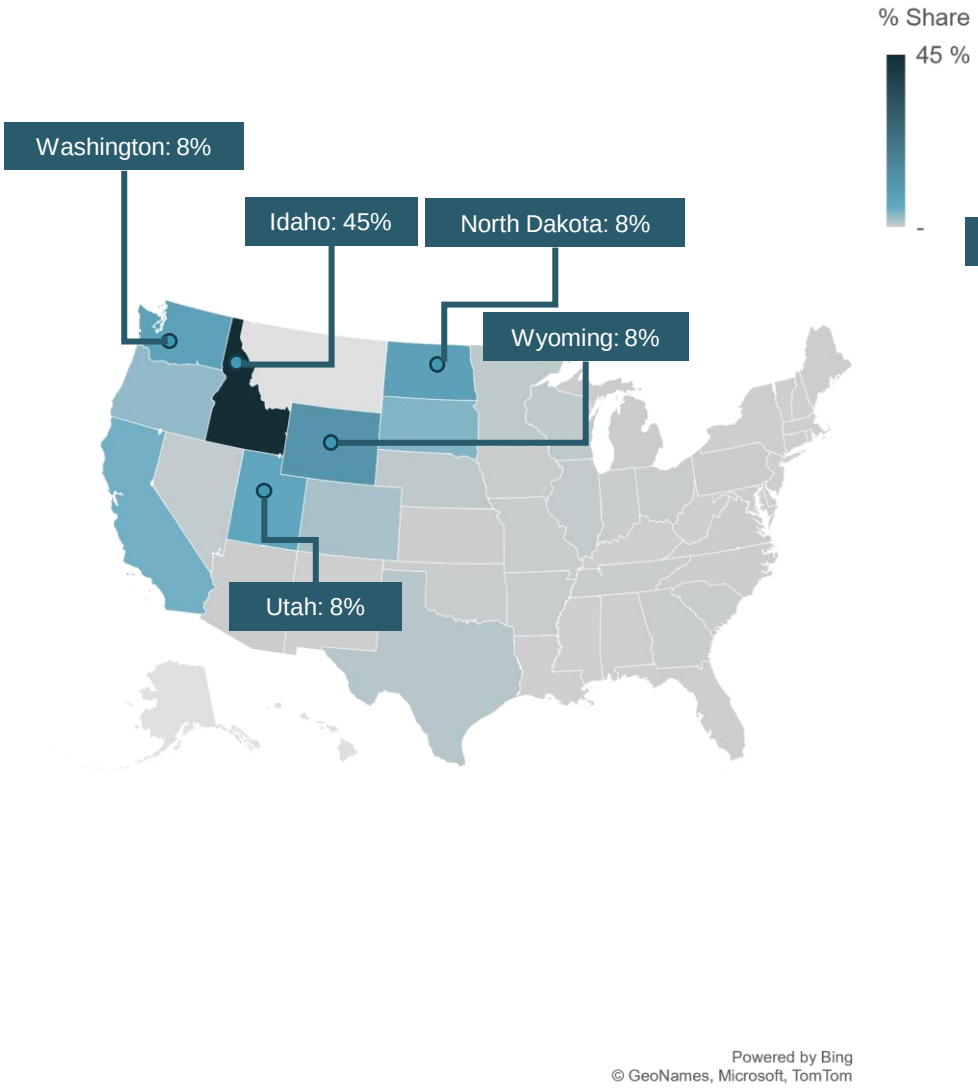


Sources: Montana Department of Transportation

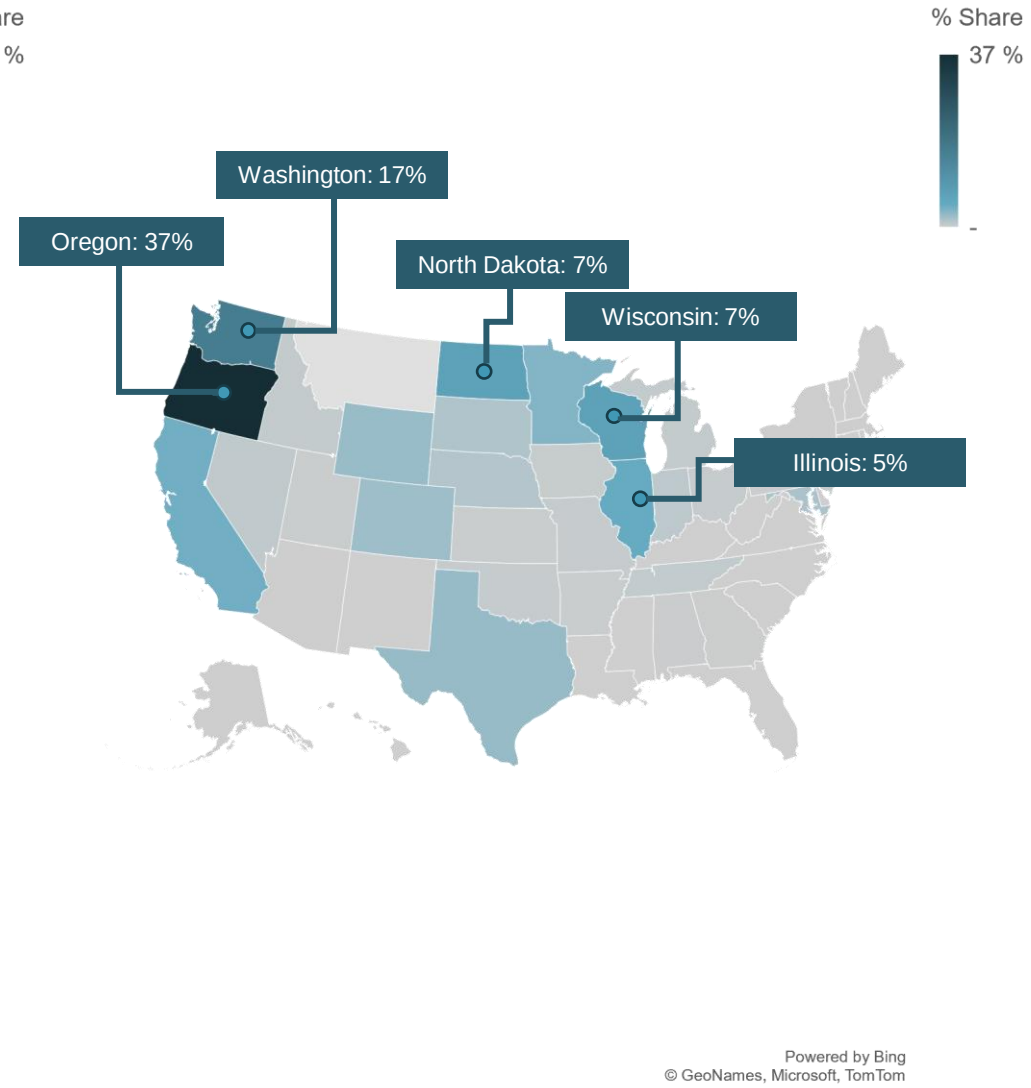
Montana Generated Freight Flows

Tonnage originating from or destined to Montana, excluding energy, tends to move East-West if transported by rail or multiple modes. Tonnage moving only on truck flows East-West and North-South to neighboring states.

MONTANA TRUCK ONLY TONNAGE FLOW SHARE BY STATE



MONTANA RAIL AND MULTIMODAL TONNAGE FLOW SHARE BY STATE

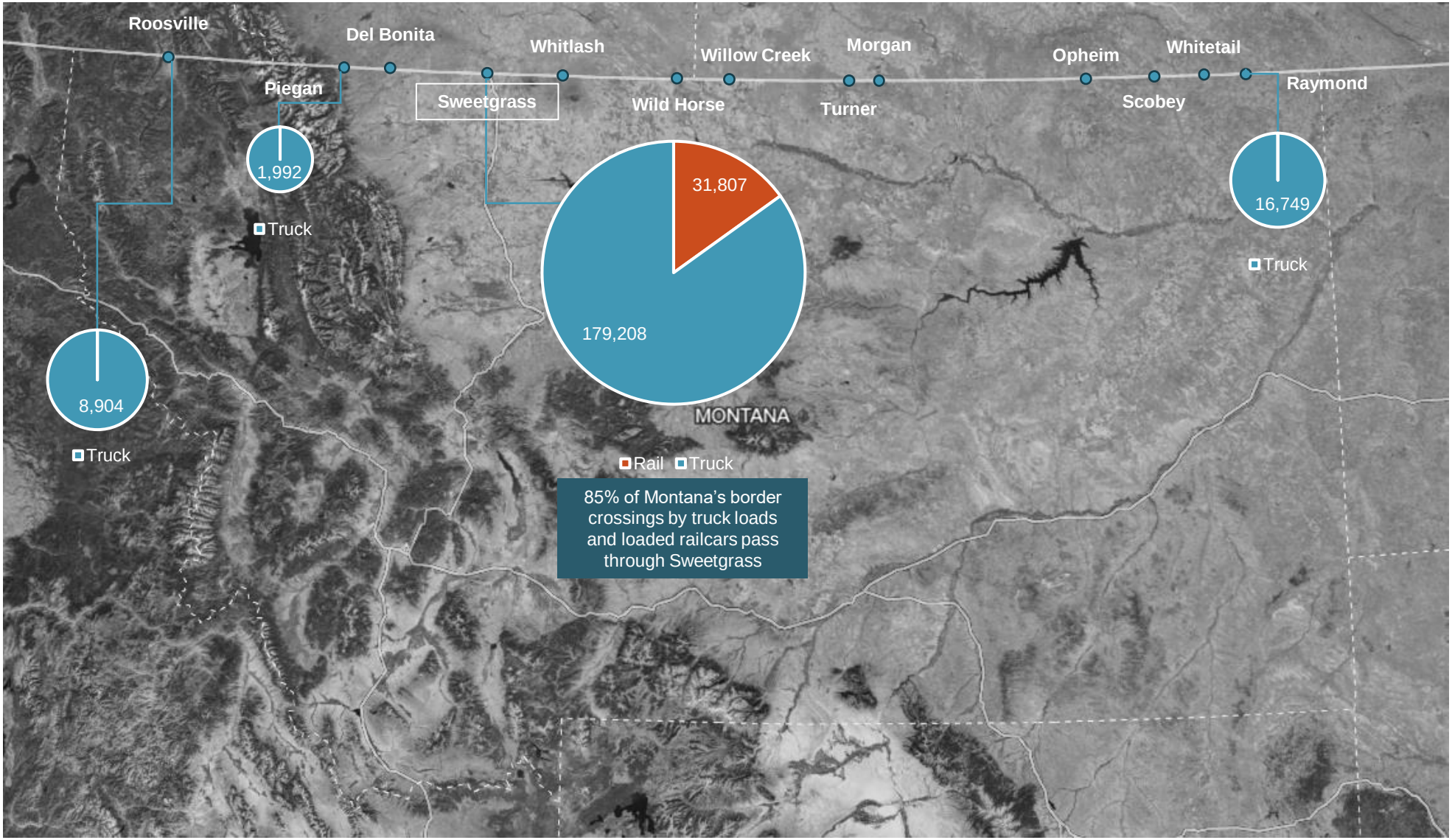


Sources: Freight Analysis Framework

Montana Ports of Entry

There are 13 border crossings between Montana and Canada. Most truck loads and loaded railcars pass to and from Canada via Sweetgrass, Montana by truck.

MONTANA PORTS OF ENTRY AND NUMBER OF CROSSINGS BY MODE: TRUCK LOADS AND LOADED RAILCARS



Sources: Google Earth, Bureau of Transportation Border Crossing Data

Crossings and Trade Value at the Montana / Canada Border

Truck and rail crossing volume has grown with trucks being the main mode of transportation while the value of Montana-Canada non-energy trade has also experienced growth driven by imports, especially in the last 2 years.

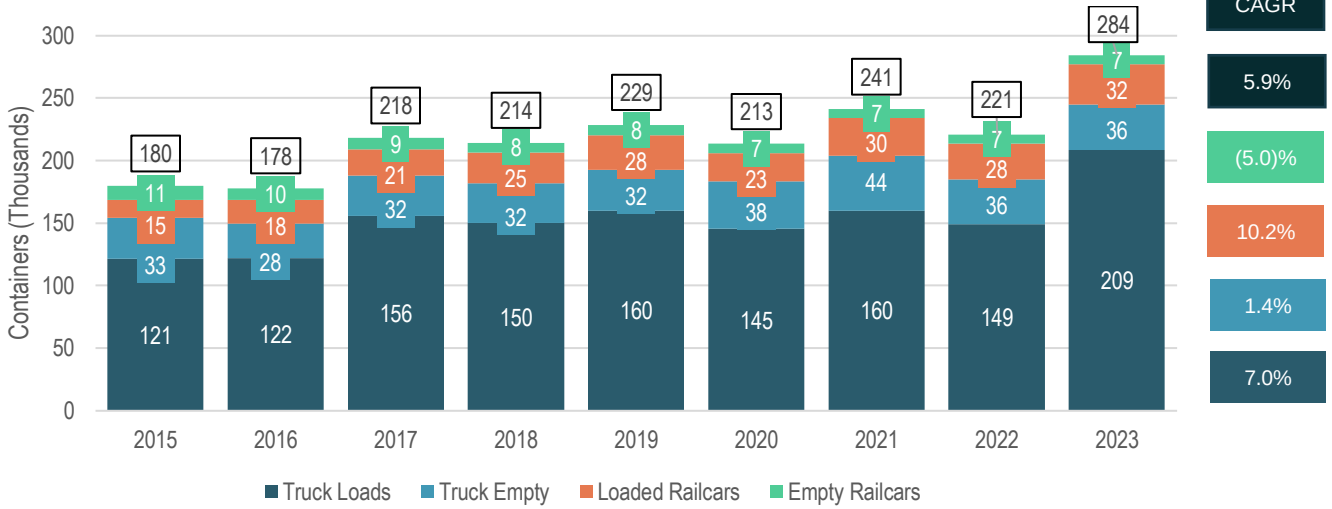
The number of crossings by trucks and railcars has experienced steady growth over the past 8 years with the largest growth spike recently from 2022 – 2023, mostly driven by truck transportation.

Loaded trucks and railcars have grown at an average annual rate of 7.0% and 10.2%, with rail doubling its loaded crossings over the past 8 years.

- Sweetgrass is the only port of entry between Montana and Canada where freight is transported by rail. Sweetgrass also experiences the highest number of crossings among Montana ports of entry.
- All other ports only receive trucks.

Trucks are mainly responsible for transporting cargo into and out of Canada, though rail also plays a key role for bulk goods.

NUMBER OF CROSSINGS THROUGH MONTANA-CANADA BORDER



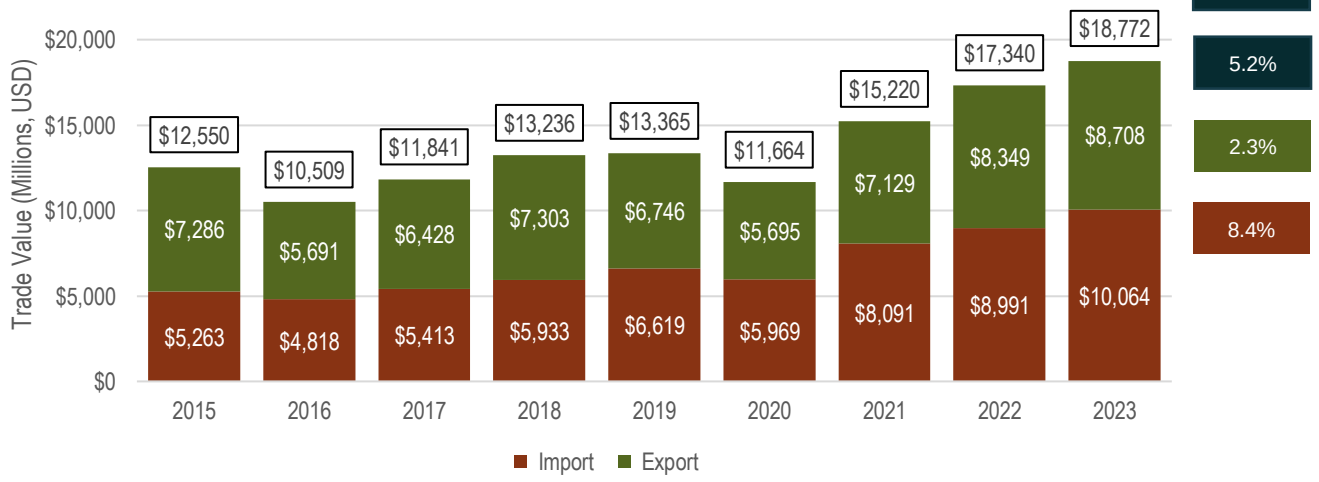
US-Canada non-energy trade through Montana ports of entry has grown to $18.8 billion, well above the 2015-2019 average of $12.3 billion.

Imports have grown at an average annual rate of 8.4% since 2015, above the 2.3% growth in exports.

- Sweetgrass has increased its share of US import value from Canada by 3% since 2015, reaching a 16% share in 2023. In terms of import value, it has moved past International Falls, Minnesota and Portal, North Dakota to become the third largest port of entry between Washington and Minnesota.
- Montana's Sweetgrass has maintained a ~13% share of US export value to Canada through ports between Washington and Minnesota.

Montana ports have maintained well-balanced trade over the last eight years, with import and export growth typically moving in the same direction.

VALUE OF US-CANADA TRADE THROUGH MONTANA PORTS OF ENTRY (EXCL. ENERGY)

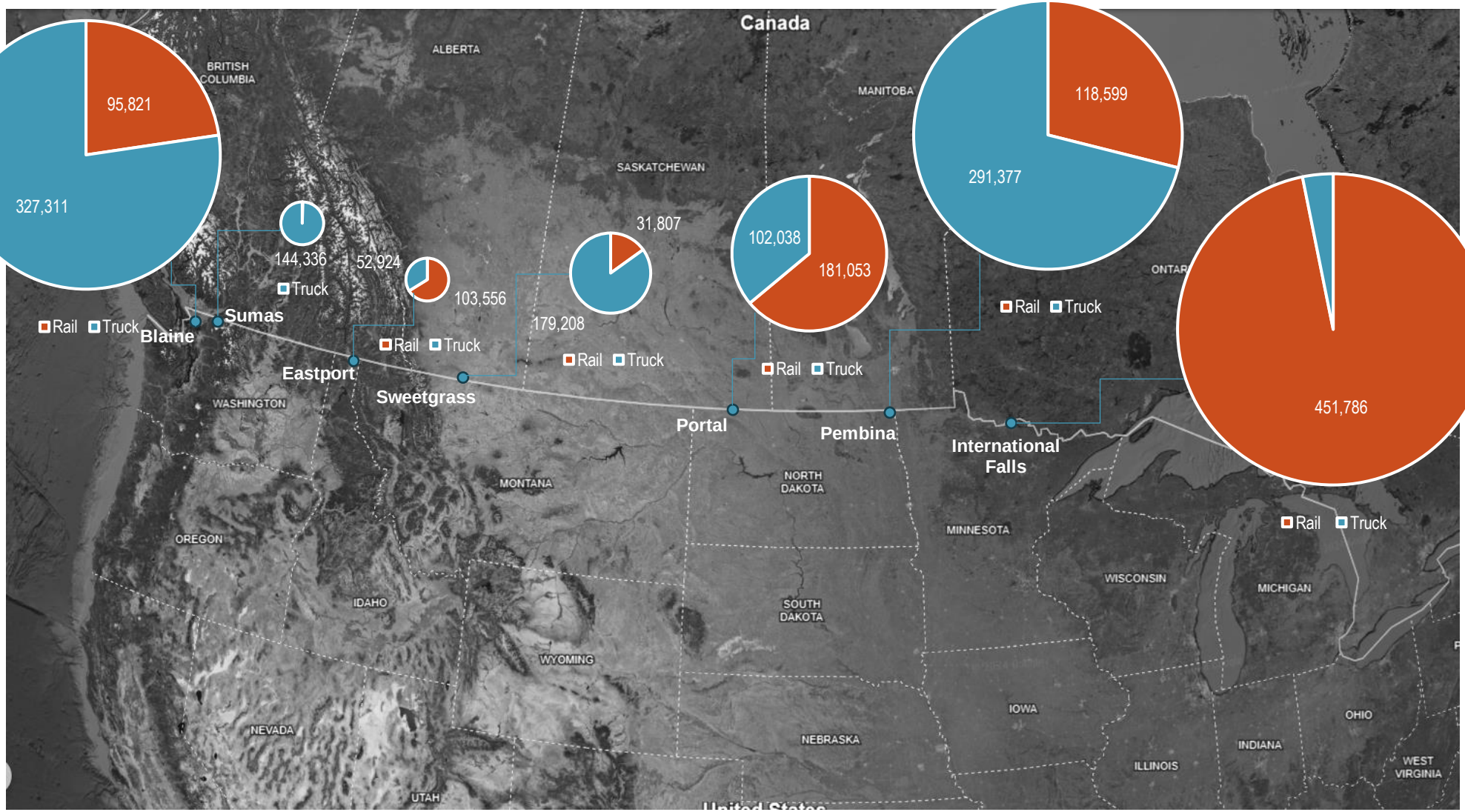


Sources: Bureau of Transportation Border Crossing Data, North American Transborder Freight Data

Major US-Canada Ports of Entry

Sweetgrass, Montana is smaller than other ports of entry which have more direct connections to large markets the in Midwest, Eastern US and California.

MAJOR US-CANADA PORTS OF ENTRY BORDER CROSSINGS BY MODE: TRUCK LOAD AND LOADED RAILCAR



Sources: Bureau of Transportation Border Crossing Data

US-Canada Trade Through Montana Ports of Entry

Freight flowing from Canada to the US through Montana tends to move North-South. A high share of US-Canada freight tonnage for states in the lower Rocky Mountain and upper Southwest regions passes through Montana ports of entry.

Montana has strong market share of freight volume passing from states to its South on the border of the Rocky Mountain and Southwest regions.

A high share of Canada freight volume to and from Utah and Nevada passes through Montana ports of entry. As the BNSF does not connect to Montana's port of entry, these markets are almost entirely served by truck.

The BNSF connects to Colorado, enabling Montana ports of entry to secure 26% of Colorado's freight exchanged with Canada.

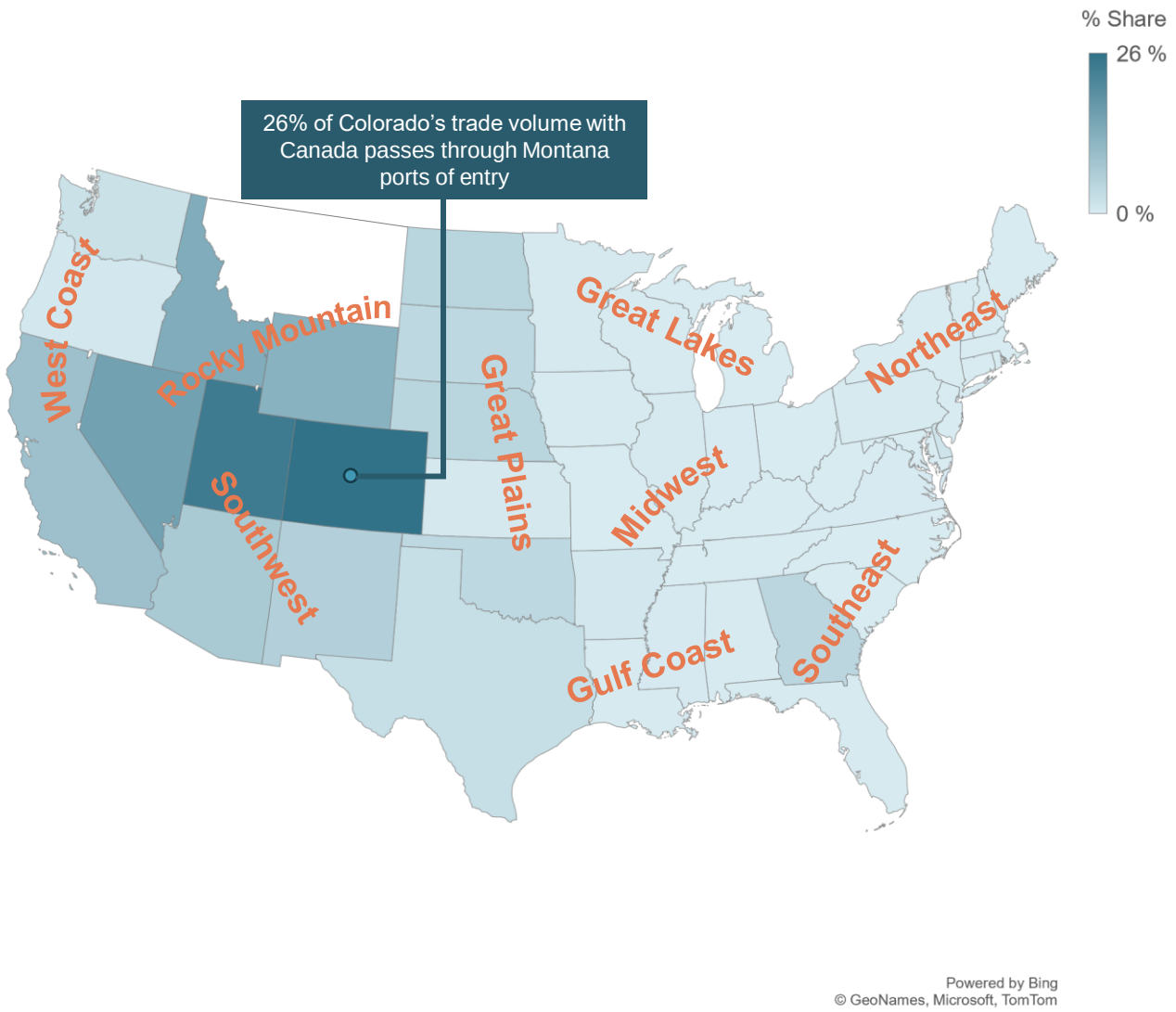
Montana also connects to Colorado's Southern neighbors but handles less of their Canada trade than ports of entry in North Dakota and Michigan.

Montana port of entry volume to New Mexico, Arizona and Texas is limited. The freight that Montana ports of entry see to and from these states primarily moves on truck.

New Mexico and Arizona receive wood products and animal feed from ports of entry in North Dakota and Washington, despite Montana also receiving animal feed and wood product shipments.

Montana also has an elevated share of freight bound for West Coast states but faces competition from Washington and Idaho ports of entry.

MONTANA PORT OF ENTRY SHARE OF US-CANADA FREIGHT TONNAGE FOR EACH STATE



Sources Freight Analysis Framework:

Montana Border Imports From Canada

Montana imports agriculture-related, wood, metal and non-metallic mineral products from Canada through its ports of entry. Other goods tend to flow through Montana to other states.

TOP COMMODITIES IMPORTED FROM CANADA THROUGH MONTANA PORTS OF ENTRY, BY VALUE

Commodity Group	Trade Value (Million $)	Primary Mode	Destination	
			Montana %	Other State %
Meat	2,244.6		0 %	100%
Machinery	1,977.4		10 %	90%
Special Classifications	1,266.6		35 %	65%
Other foodstuffs	775.2		31 %	69%
Live Animals	506.4		2 %	98%
Animal Feed	396.4		3 %	97%
Wood Products	343.5		47 %	53%
Plastics	278.7		8 %	92%
Vehicles	278.5		27 %	73%
Fertilizers	266.6		55 %	45%
Metals	326.1		20 %	80%
Furniture	150.4		26 %	74%
Chemicals	306.5		13 %	87%
Milled Products	97.2		8 %	92%
Cereal Grains	93.9		79 %	21%
Other Ag Products	164.5		39 %	61%
Paper	55.9		6 %	94%
Nonmetallic Mineral Products	38.4		36 %	64%

Sources: Bureau of Transportation Statistics North American Transborder Freight Data, Freight Analysis Framework, USA Trade Online, M&N

Montana Border Exports to Canada

Much of the goods exported to Canada through Montana ports of entry do not originate in Montana. This reflects that firms in other states leverage connectivity through Montana to access Canadian markets.

TOP COMMODITIES EXPORTED TO CANADA THROUGH MONTANA PORTS OF ENTRY, BY VALUE

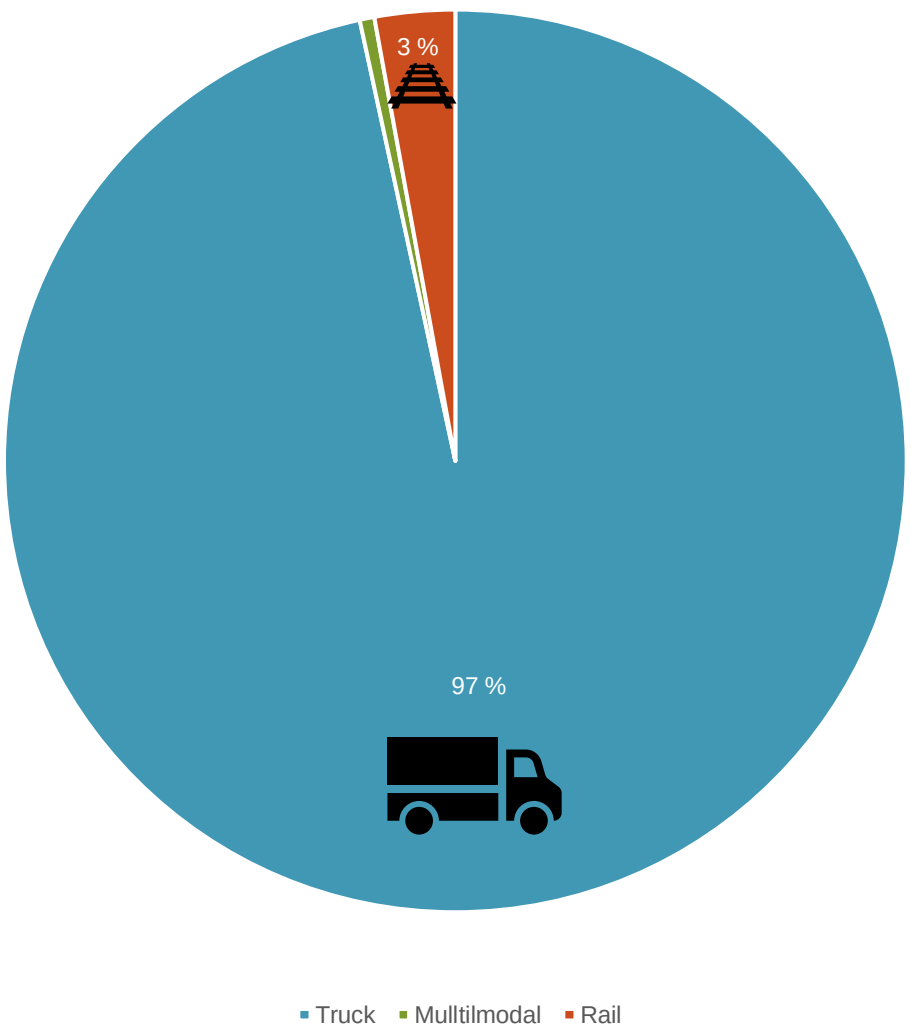
Commodity Group	Trade Value (Million $)	Primary Mode	Origin	
			Montana %	Other State %
Other Chemical Products	169.1		8 %	92%
Live Animals / Fish	115.1		10 %	90%
Other Agricultural Products	107.9		2 %	98%
Machinery	64.6		0 %	100%
Vehicles	51.3		1 %	99%
Animal Feed	29.6		5 %	95%
Basic Chemicals	18.7		4 %	96%
Medical Measuring / Testing Instruments	7.7		0 %	100%
Plastics / Rubber	6.9		0 %	100%
Trasnportation Equipment	3.4		1 %	99%
Other Manufactured Products	2.9		0 %	100%
Milled Grain Products	1.2		0 %	100%
Base Metals	1.1		0 %	100%
Fertilizers	1.0		0 %	100%
Food / Beverage Manufacturing	0.0		0 %	100%

Sources: Bureau of Transportation Statistics North American Transborder Freight Data, Freight Analysis Framework, USA Trade Online, M&N

Montana Within State Freight Modes and Commodities

On a pure tonnage basis (not ton-miles) and excluding energy products, which predominately move by pipeline and truck, freight moving within Montana predominately uses trucks. The largest commodities by freight volume within Montana reflect the state's top industries.

WITHIN STATE TONNAGE BY MODE (2023, EXCL. ENERGY)



TOP 20 WITHIN STATE COMMODITIES BY TONNAGE (EXCL. ENERGY)

Commodity	2023 Tons (1,000s)	5yr CAGR	>10% Mode Share by Commodity		
			Truck	Multimodal	Rail
Gravel	7,834	1%	●		
Logs	4,051	3%	●		
Cereal grains	3,955	-9%	●		
Nonmetal mineral products	3,293	0%	●		
Waste/scrap	2,161	-2%	●		
Animal feed	1,773	2%	●		
Wood products	1,508	2%	●		
Mixed freight	743	1%	●		
Nonmetallic minerals	720	2%	●		
Fertilizers	710	3%	●		●
Natural sands	474	2%	●		
Other agriculture products	340	-2%	●		
Alcoholic beverages	286	1%	●		
Chemical products	254	3%	●		
Other foodstuffs	249	1%	●		
Basic chemicals	232	3%	●		
Live animals/fish	176	2%	●		
Base metals	138	1%	●		
Articles-base metal	129	1%	●		
Milled grain products	128	2%	●		

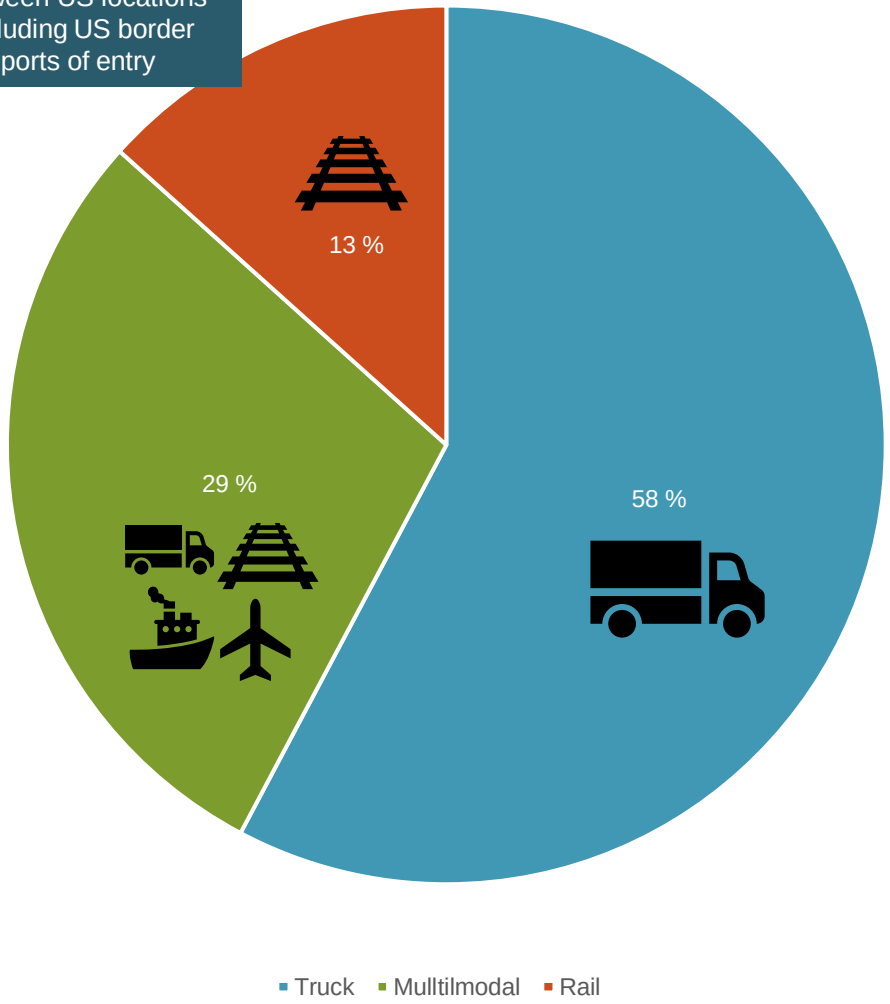
Sources: US Department of Transportation Freight Analysis Framework, Bureau of Labor Statistics

Montana Outbound Freight Modes and Commodities

Cereal grains, the largest non-energy outbound commodity group, uses a variety of transportation modes, contributing to higher shares of multimodal and rail observed for outbound domestic volumes. Excluding cereal grains, outbound freight flows still have more diverse transport mode usage than inbound or within state freight flows.

OUTBOUND DOMESTIC TONNAGE BY MODE (2023, EXCL. ENERGY)

Domestic refers to freight transported between US locations including US border ports of entry



TOP 20 OUTBOUND DOMESTIC COMMODITIES BY TONNAGE (EXCL. ENERGY)

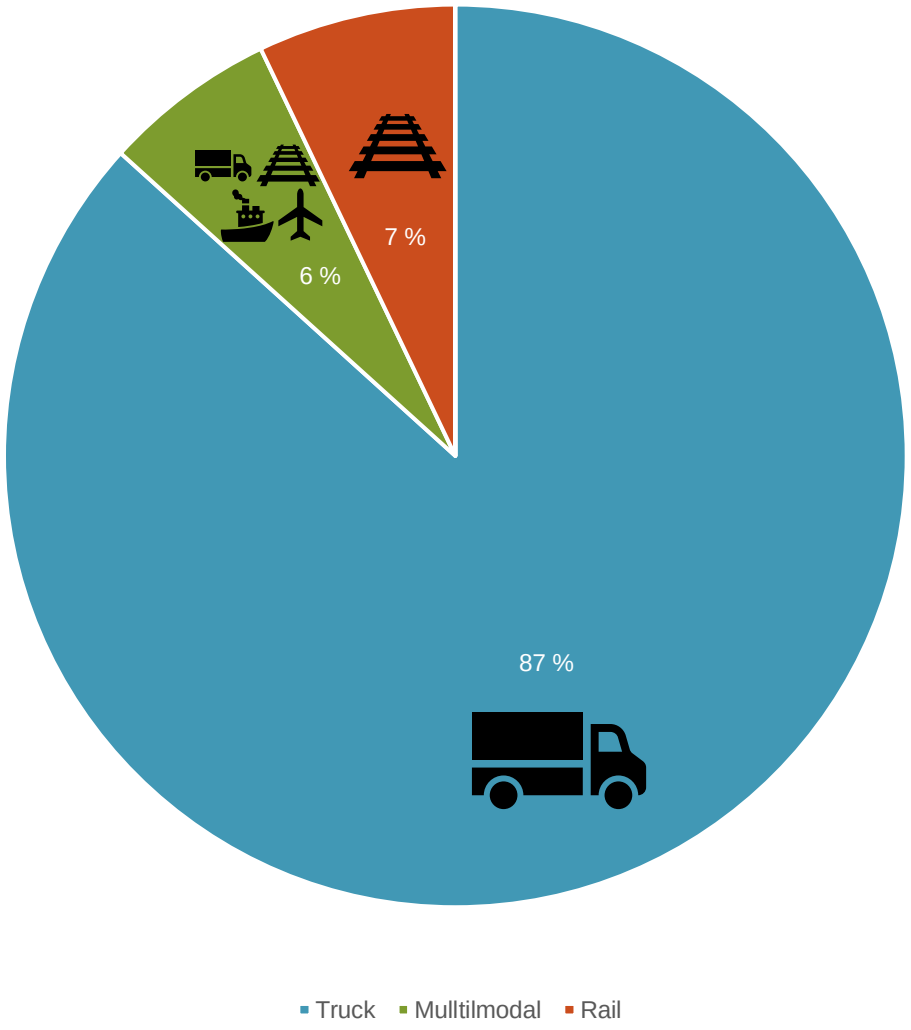
Commodity	2023 Tons (1,000s)	5yr CAGR	>10% Mode Share by Commodity		
			Truck	Multimodal	Rail
Cereal grains	7,508	-11%	●	●	●
Gravel	2,632	2%	●		
Wood products	2,190	2%	●	●	●
Other agriculture products	2,167	-3%	●		
Animal feed	1,515	2%	●		
Other foodstuffs	789	1%	●	●	●
Milled grain products	582	2%	●		
Basic chemicals	529	3%	●	●	●
Nonmetal mineral products	497	-1%	●	●	
Waste/scrap	396	0%	●	●	
Live animals/fish	350	2%	●		
Nonmetallic minerals	219	2%	●	●	
Base metals	199	1%	●	●	
Mixed freight	122	2%	●		
Chemical prods.	100	3%	●		
Building stone	51	4%	●		
Articles-base metal	47	1%	●		
Alcoholic beverages	37	1%	●		
Other manufactured products	34	3%	●	●	
Machinery	32	1%	●		

Sources: Freight Analysis Framework, Bureau of Labor Statistics

Montana Inbound Freight Modes and Commodities

Excluding energy, inbound freight flows from other US states predominately travel by truck. This may stem from the state's proximity to maritime ports and a propensity to trade with neighboring states.

INBOUND DOMESTIC TONNAGE BY MODE (2023, EXCL. ENERGY)



TOP 20 INBOUND DOMESTIC COMMODITIES BY TONNAGE (EXCL. ENERGY)

Commodity	2023 Tons (1,000s)	5yr CAGR	>10% Mode Share by Commodity		
			Truck	Multimodal	Rail
Mixed freight (Consumer Products)	1,660	1%	●		
Other agriculture products	1,524	-2%	●		
Other foodstuffs	1,121	1%	●		
Wood products	1,093	2%	●		
Animal feed	817	1%	●		
Natural sands	691	0%	●		
Cereal grains	658	-3%	●		
Nonmetal mineral products	618	0%	●		
Nonmetallic minerals	383	-1%	●	●	
Other manufactured products	343	3%	●	●	
Basic chemicals	342	3%	●	●	●
Machinery	232	0%	●		
Motorized vehicles	218	2%	●	●	
Chemical products	197	2%	●		●
Articles-base metal	191	-1%	●		
Fertilizers	179	1%	●		
Base metals	177	0%	●	●	
Plastics/rubber	150	2%	●		
Alcoholic beverages	140	1%	●		
Waste/scrap	139	-3%	●		

Sources: Freight Analysis Framework, Bureau of Labor Statistics

Montana Major Industries

Montana has a high concentration of mining, agriculture, energy and forest product industries. These industries drive economic activity and freight transported in and out of Montana.

Montana has a large and diverse mining industry.

Quarries extract stone and lime to produce gravel and non-metallic minerals.

Non-ferrous (copper) and precious metals (palladium, platinum) are also extracted in Montana.

Crop and animal farming play large roles in Montana's economy.

Montana grows cereal grains such as wheat, barley and oats, fostering flour mills and breweries in the state. It also produces other agriculture products such as sugar beets and peas.

Montana has a large cattle and hog farming industry. Animal slaughter and meat processing firms operate in Montana.

Crop and animal agriculture encourage production and trade of animal feed products between Montana and other nearby livestock farming states.

Food manufacturing is not concentrated in Montana but does occur, though on a smaller scale than in nearby states.

Montana has several oil refineries, including the Calumet refinery in Great Falls.

As oil and gas extraction declines in Montana, refineries increasingly rely on pipelined crude oil from Canada and Wyoming.

Logging occurs in the forests of western Montana, giving rise to some wood product manufacturing.

Montana has a high concentration of forestry and wood product manufacturing.

Logs are primarily within Montana for wood product manufacturing. The state brings in some wood products while sending out veneer, plywood and other milled goods.

Construction and fabricated metal manufacturing drive metal shipments in and out of Montana.

Structural base metal manufacturers source steel products from other states to produce beams, frames and other components used in construction and infrastructure projects.

Industries of interest highlighted in green

MONTANA INDUSTRIES BY GDP CONCENTRATION[1]

Industry	Location Quotient	2022 GDP ($ Mil)	5yr CAGR	% of GDP
Mining (excl. oil, gas)	**9.4**	1,247	4%	3%
Farms	**4.1**	1,262	3%	3%
Petroleum / Coal Products Manufacturing	**3.7**	741	-15%	2%
Forestry, Fishing	**3.3**	328	3%	1%
Wood Product Manufacturing	**2.4**	196	-12%	0%
Construction	**1.6**	3,176	3%	7%
Arts, Leisure, Accommodation	**1.5**	3,183	5%	7%
Transportation, Warehousing	**1.4**	2,342	1%	5%
Education, Healthcare	**1.3**	6,013	3%	13%
Retail Trade	**1.3**	3,592	1%	8%
Utilities	**1.2**	944	-3%	2%
Government	**1.2**	7,454	0%	16%
Nonmetallic Mineral Product manufacturing	**1.1**	164	1%	0%
Oil and Gas Extraction	**1.0**	342	-3%	1%
Wholesale Trade	**1.0**	2,740	0%	6%
Finance, Insurance	**1.0**	10,478	3%	23%
Fabricated Metal product manufacturing	**0.6**	182	1%	0%
Information	**0.5**	1,749	9%	4%
Food, beverage manufacturing	**0.4**	291	1%	1%
Chemical manufacturing	**0.2**	202	18%	0%

Sources: Bureau of Economic Analysis; [1]GDP concentration measured with location quotient (Montana Industry Share of Montana GDP / US Industry Share of US GDP): LQ > 1.5 indicates concentration

Montana Major Industries

Construction, fabricated metal manufacturing and beverage manufacturing have expanded considerably over the last two decades. Conversely, oil and gas extraction and wood product manufacturing experienced notable declines.

Colors in graphs reflect industry expansion or contraction over the last two decades.

- Expansion
- Moderate Growth
- Flat
- Declining

Construction has outperformed total employment growth considerably and regained employment lost after the Great Recession in 2008.

Mining and forestry have experienced strong employment growth over the last decade, in line with Montana's total employment growth.

Farms have regained employment lost during the 2000's. Employment is in line with 1998 levels, suggesting neither boom nor bust in the agriculture sector.

Oil and gas extraction has seen employment fall over the last decade as the industry shifted toward crude reserves in North Dakota.

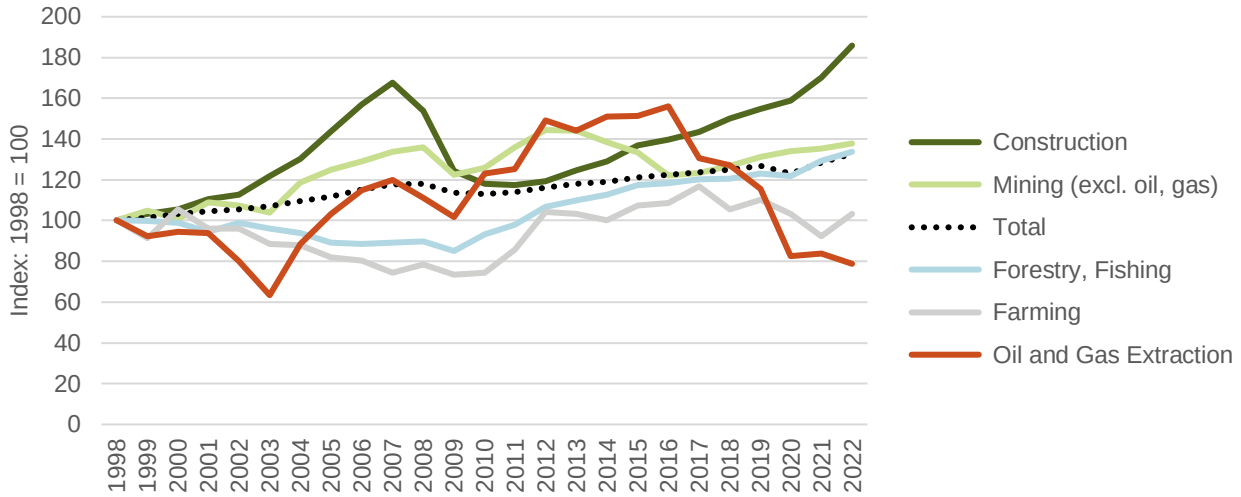
Fabricated metal manufacturing has experienced considerable employment growth over the last two decades. Employment has more than doubled since 1998.

Beverage manufacturing has also doubled from 1998 levels with considerable growth occurring in the last decade. Microbreweries and distilleries have driven this growth. Conversely, food manufacturing grew 20% since 1998 has lagged total employment growth.

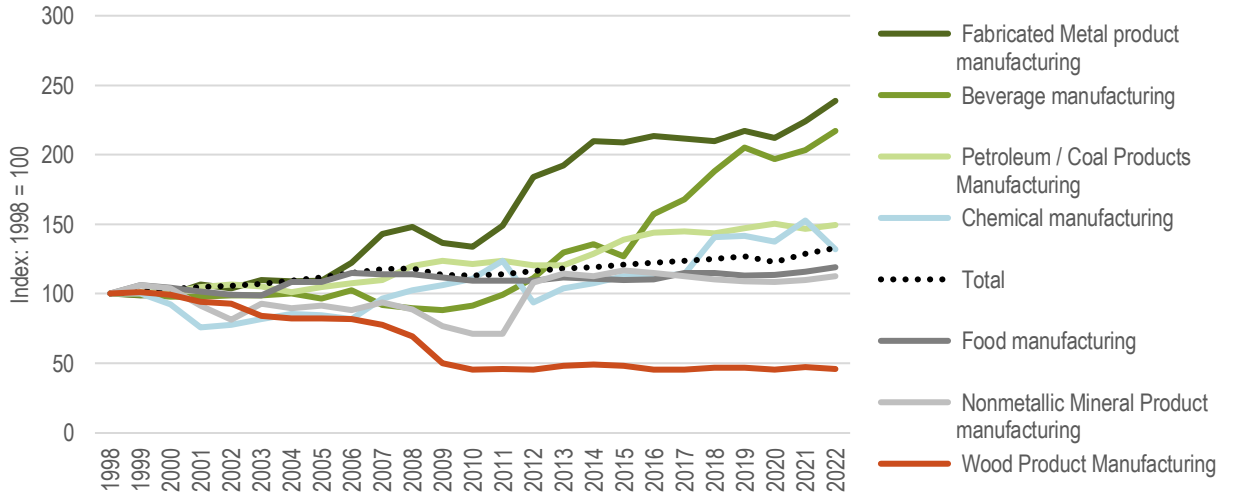
Energy product manufacturing and chemicals have both grown more than 30% since 1998, slightly outpacing total employment growth over the last decade.

Wood product manufacturing, a major employer in Montana, has declined consistently since 1998. Employment has stabilized at 50% of 1998 levels.

MAJOR NON-MANUFACTURING INDUSTRIES: EMPLOYMENT INDEX



MAJOR MANUFACTURING INDUSTRIES: EMPLOYMENT INDEX



Sources: Bureau of Economic Analysis

Petroleum Market Overview

Although less prevalent than before, petroleum refining is still present in Montana with a notable refinery in Great Falls. Petroleum and natural gas move in and out of Montana mainly via pipeline.

Petroleum extracting and refining was a much larger industry in the early 2000s, however, production is still present with four major refineries including one in Great Falls.

The majority of the state's crude oil comes from the Bakken Formation, which lies on the border with North Dakota.

- In 2022, Montana's annual crude oil production was 56,000 barrels per day, down from its peak production in 2006 of 100,000 barrels per day but a first time increase within the past three years.
- However, most of the crude oil used by the refineries in the state comes from Canada and Wyoming.

Montana has a total of four refineries capable of processing 218,000 barrels of crude oil daily. Three of the largest refineries are located near Billings.

In 2023, the smaller refinery, Calumet Montana, in Great Falls completed an expansion project, allowing the refinery to produce sustainable aviation fuel from animal fat and vegetable oil.

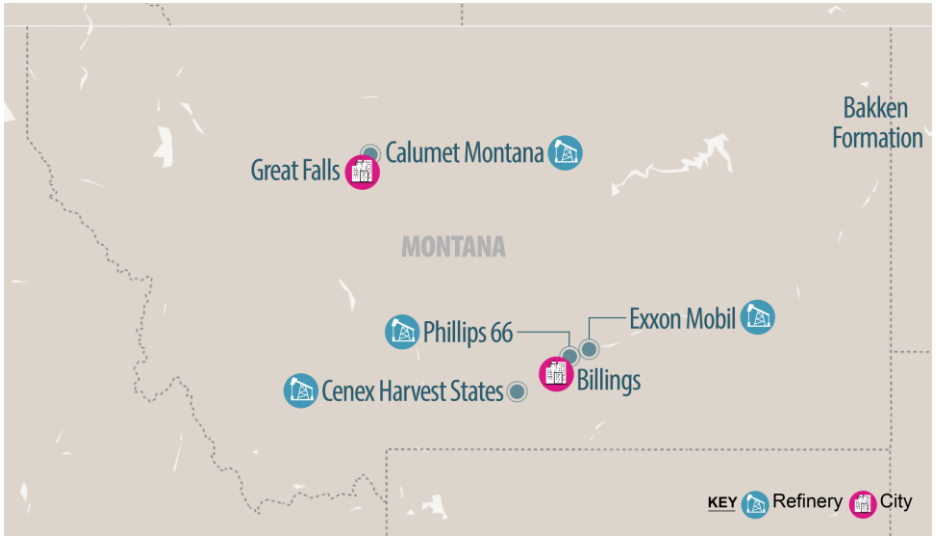
- Great Falls has an airport and an air force base, creating potential demand for jet fuel.

Crude petroleum and natural gas move mainly via pipeline.

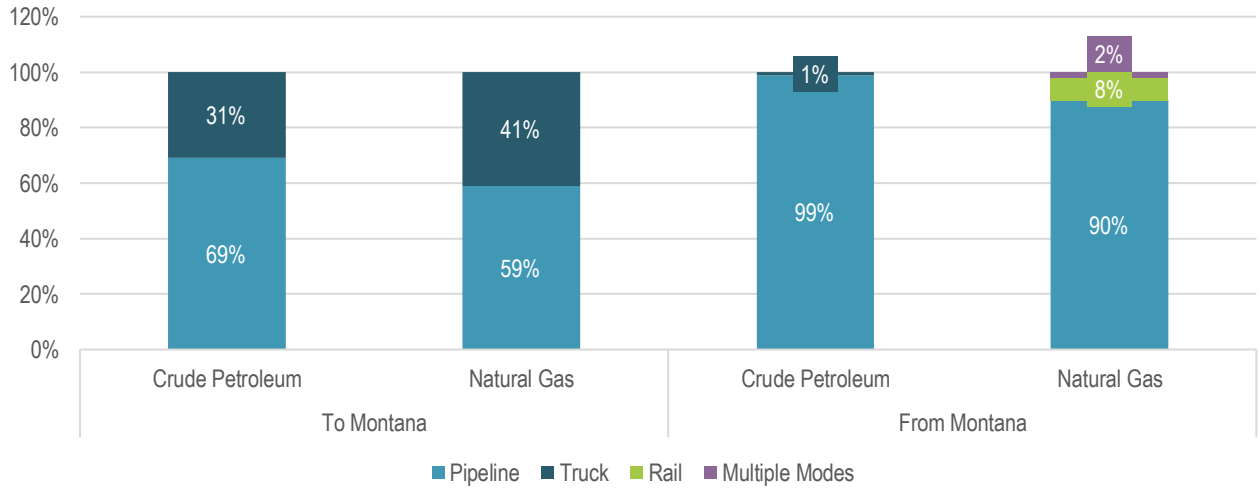
Most of the crude petroleum and natural gas products are transported by pipeline in and out of Montana.

- The second most popular option is transportation by truck, although this option has a smaller share.
- Rail only appears as a transportation option for natural gas and has a small share at 8% of volume.

MONTANA PETROLEUM REFINERIES



2023 DOMESTIC ENERGY PRODUCT FLOWS TO & FROM MONTANA



Sources: Energy Information Agency, Freight Analysis Framework, Google Earth

Agriculture Market Overview

Montana is the third largest wheat producer and second largest barley producer in the country. Wheat and barley production surrounds Cascade County, supporting the county's grain milling industry.

Montana grows wheat, barley and oats primarily in the state's North and Northeast

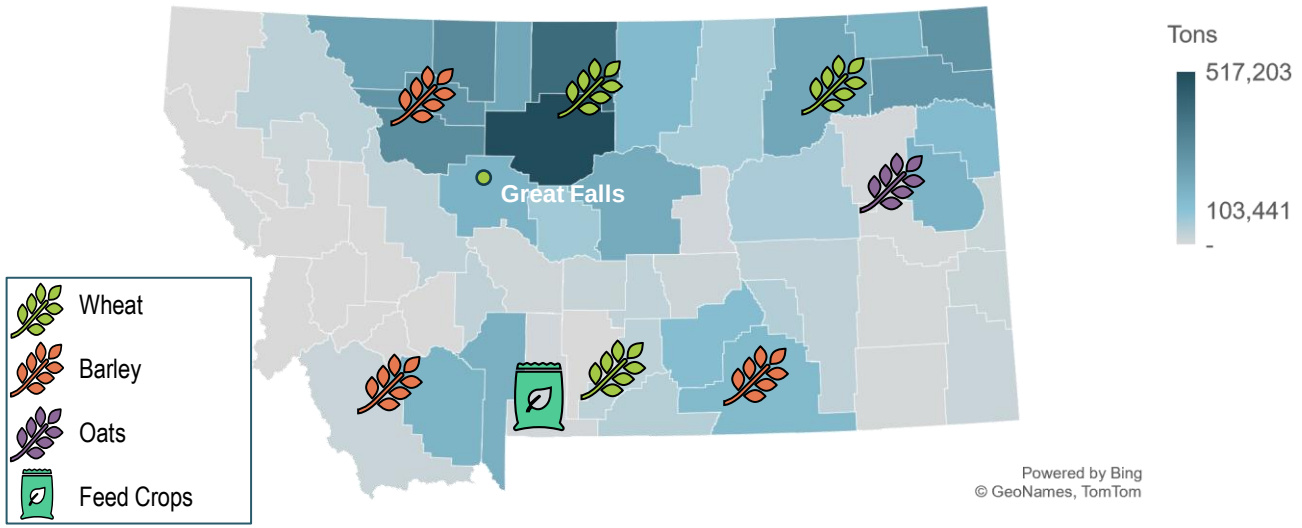
Montana's cereal grain production concentrates in the state's North and South Central regions. The state is the third-largest wheat producer in the country, harvesting 5.0 million tons in 2023.

- The north and central counties surrounding Cascade produce the bulk of Montana's wheat. Chouteau and Hill Counties accounted for 21% of Montana's 2022 wheat production.
  - Wheat is primarily used for baked goods and animal feed.
  - According to the Montana Department of Transportation 2022 Freight Plan, approximately 25% of the state's grain is exported overseas, typically transported from truck to multimodal rail facilities and on to West Coast ports.
- 1.5 million tons of silage corn were produced in 2023. This corn primarily serves as feed for livestock.
- Montana produced 1.1 million tons of barley in 2023, ranking second in the county, behind Idaho. Barley production primarily occurs in counties Northwest of Cascade.
  - Barley can be used in animal feed, beer, bread, soup and other food products.
- McCone, Richland and other Eastern counties contributed to the 12,000 tons of oats produced in 2023. At the national level, Montana's oat industry is less prominent than wheat or barley.
- Montana also produces pulse crops such as chickpeas, peas and other legumes.

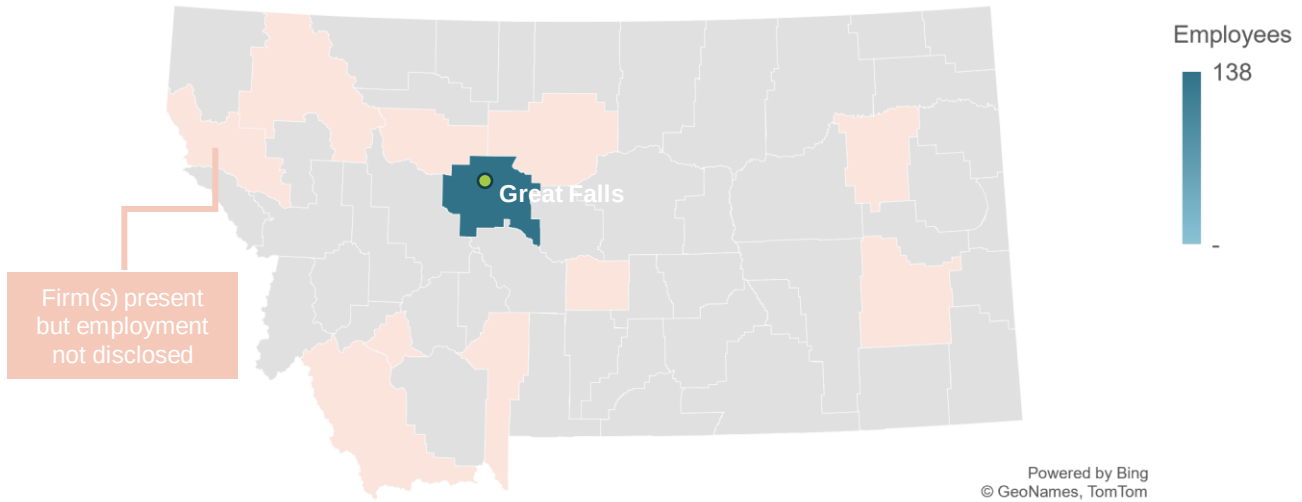
Milling occurs in several parts of the state. Cascade County has three grain milling firms.

Montana's grain mills take advantage of the cereal grain supply. Cascade County, surrounded by wheat and barley fields, has the highest number of grain and oilseed milling firms with three establishments in 2023.

CEREAL GRAIN PRODUCTION BY COUNTY (2022)[1]



GRAIN AND OILSEED MILLING EMPLOYEES BY COUNTY (2023)

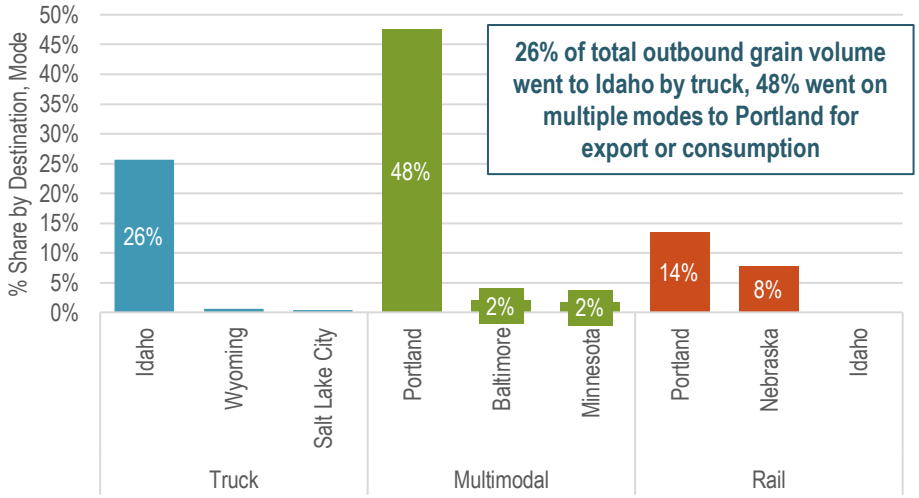


Sources: US Department of Agriculture, Bureau of Labor Statistics; [1]Includes wheat, barley and oats. Silage corn production not available at county level

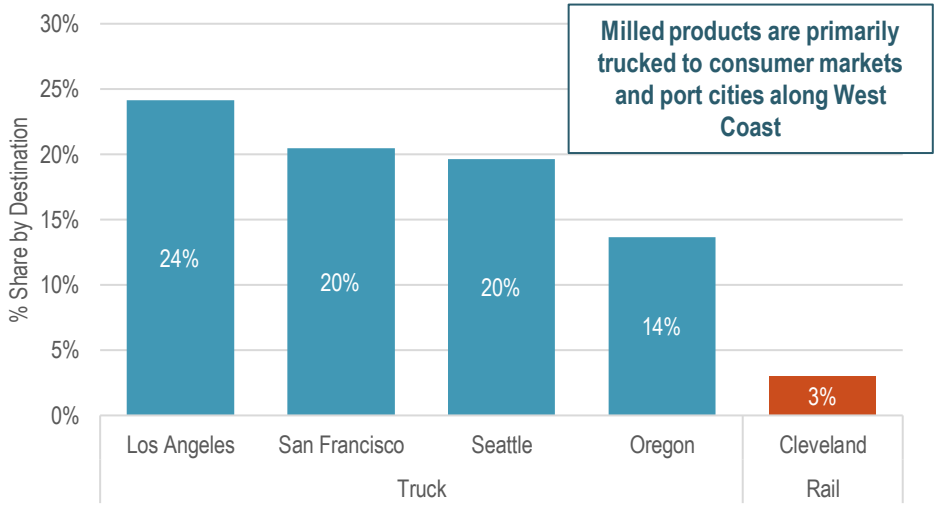
Agriculture Market Overview

Agriculture goods exported internationally, such as cereal grains, use trucks, rail and barge to reach port cities. Agriculture goods sold to nearby end-users in Idaho rely on trucks. Milled products also rely on trucks to reach consumer markets and port cities along the West Coast.

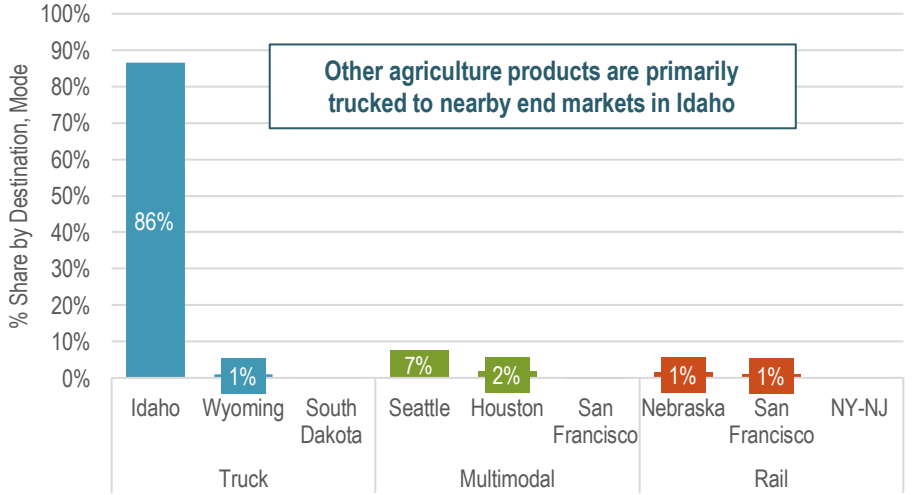
OUTBOUND DOMESTIC CEREAL GRAIN VOLUME: DESTINATION AND MODE SHARE



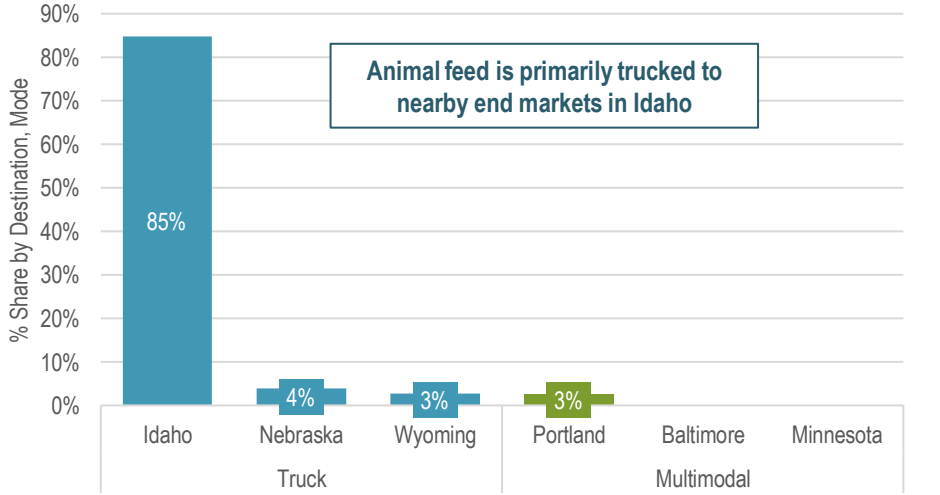
OUTBOUND DOMESTIC MILLED PRODUCT VOLUME: DESTINATION AND MODE SHARE



OUTBOUND DOMESTIC OTHER AGRICULTURE VOLUME: DESTINATION AND MODE SHARE



OUTBOUND DOMESTIC ANIMAL FEED VOLUME: DESTINATION AND MODE SHARE



Sources: Freight Analysis Framework

Fertilizer Market Overview

Great Falls is surrounded by sources of all three key macronutrient fertilizers (nitrogen, phosphorous, potash). Montana imports most of its fertilizer by truck.

Montana imports nitrogen and potash fertilizer from Canada. 82% of fertilizer tonnage arrives by truck over the Montana border.

Montana imports potash from production hubs in Saskatchewan. Notably, fertilizer imports from Canada to other states do not typically pass through Montana. Tonnage instead flows through North Dakota ports of entry with better connections to large markets in the Midwest.

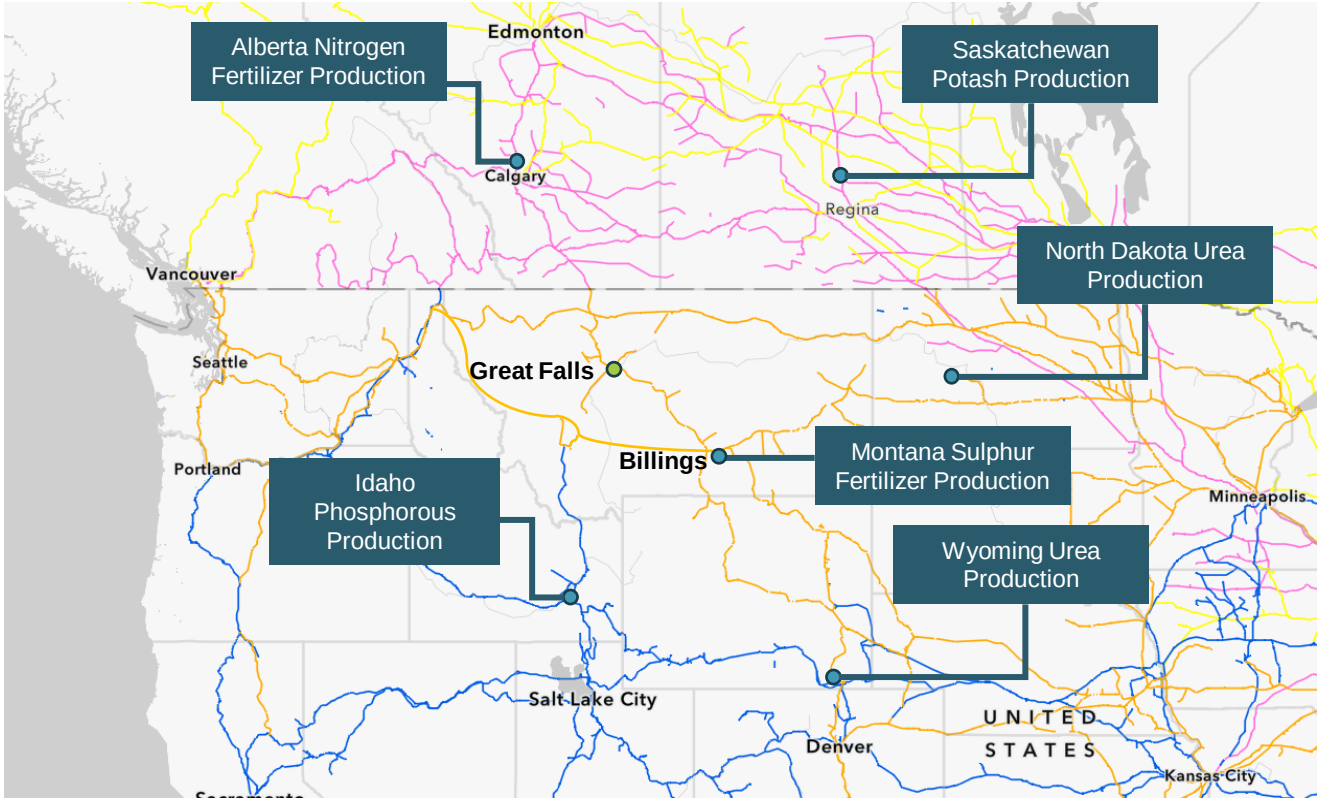
Nitrogen fertilizer is produced in Alberta, Canada. Alberta hubs connect to Montana by rail, allowing more fertilizer to enter Montana from Canada through Sweetgrass by rail.

Montana Sulphur produces Sulphur based fertilizer products near the Billings, Montana oil refineries.

Idaho is a major phosphorous fertilizer producer in the US. Fertilizer products are predominately trucked between the states.

Wyoming and North Dakota have considerable urea fertilizer production capacity due to the prevalence of energy product manufacturing in these states. Montana transports fertilizer from Wyoming by truck.

FERTILIZER PRODUCTION HUBS NEAR MONTANA



Source	Fertilizer	Mode?
Canada (Alberta / Saskatchewan)	Nitrogen, Potash	Rail and Truck
Idaho	Phosphorous	Truck
Wyoming	Nitrogen	Truck
North Dakota	Nitrogen	Likely Truck

Sources: Freight Analysis Framework, Arc GIS, Montana Sulphur

Agriculture Market Overview

Montana has more cattle than residents, reflecting the large size of its cattle ranching industry. Cascade County is surrounded by cattle inventory and has significant hog inventory, giving rise to a relatively high concentration of slaughter and meat processing firms.

Montana had 2.2 million cattle at the start of 2023, nearly double the 1.1 million estimated Montana residents.

The cattle ranching industry stands among the largest in Montana. Counties throughout the state have cattle inventory in the tens of thousands.

- The state's Southwest, Central and Eastern counties have the highest concentrations of cattle inventory.
- Beaverhead County reported 105,000 cattle in inventory at the start of 2023.
- Fergus County had the second-largest inventory at 100,000 cattle. It lies just East of Judith Basin County and Cascade County which had over 100,000 cattle, combined.
- Counties up and down East Montana had most of the state's cattle inventory.

Cascade County has one of the largest hog inventories in Montana.

Cascade County has a high concentration of hog-raising farms, supporting the slaughter and processing industry,

Animal slaughter and processing firms tend to operate near Montana's population centers, including Cascade County.

Most animal slaughter and processing firms operate near Montana's population centers, including Yellowstone County, Gallatin County, Cascade County, Ravalli County and Flathead County.

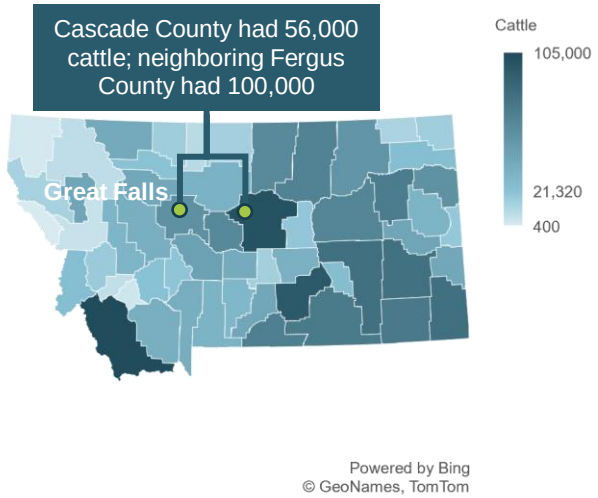
- Cascade County has four animal slaughter and processing firms, benefiting from the large cattle supply in Central and Eastern Montana.

Dairy and milk production is not as widespread as slaughter and meat processing.

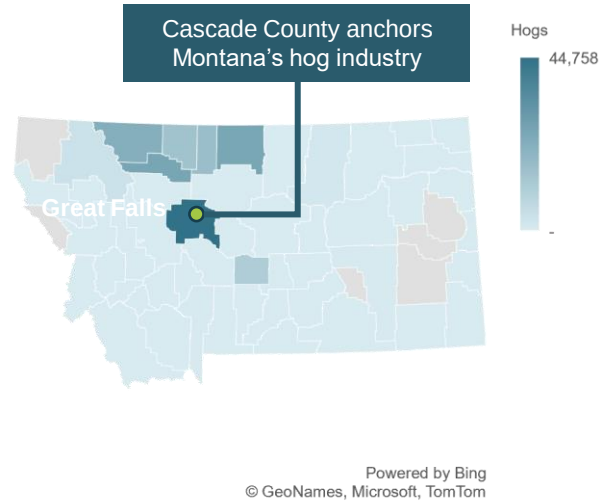
Montana has 10 dairy and milk production firms, half in Gallatin County.

Beef cattle are more prominent in Montana, giving rise to a more robust slaughter and meat processing sector.

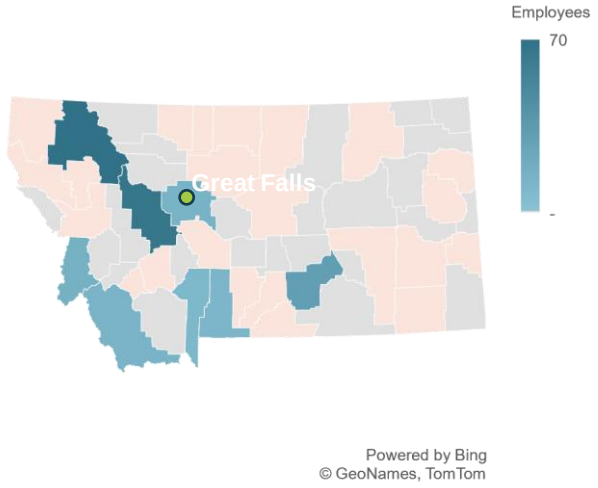
CATTLE INVENTORY BY COUNTY (2023)



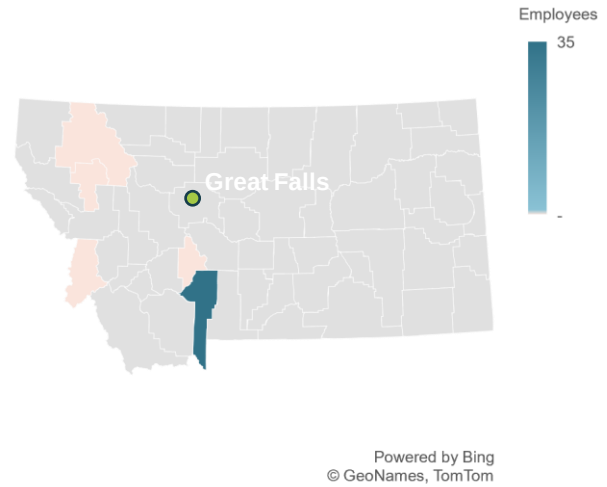
HOGS INVENTORY BY COUNTY (2022)[1]



SLAUGHTER AND PROCESSING EMPLOYEES BY COUNTY (2023)



DAIRY AND MILK PRODUCTION EMPLOYEES BY COUNTY (2023)



Sources: US Department of Agriculture, Bureau of Labor Statistics; [1]County data not disclosed for all counties.

Agriculture Market Overview

Trucks carry Montana's outbound meat volume to nearby markets and ports in the Northwest US.

Processed meat is trucked to a variety of states in the Western US.

Meat shipments travel by truck. Wyoming, Seattle, South Dakota, Minneapolis, North Dakota and San Francisco received the bulk of Montana's meat products.

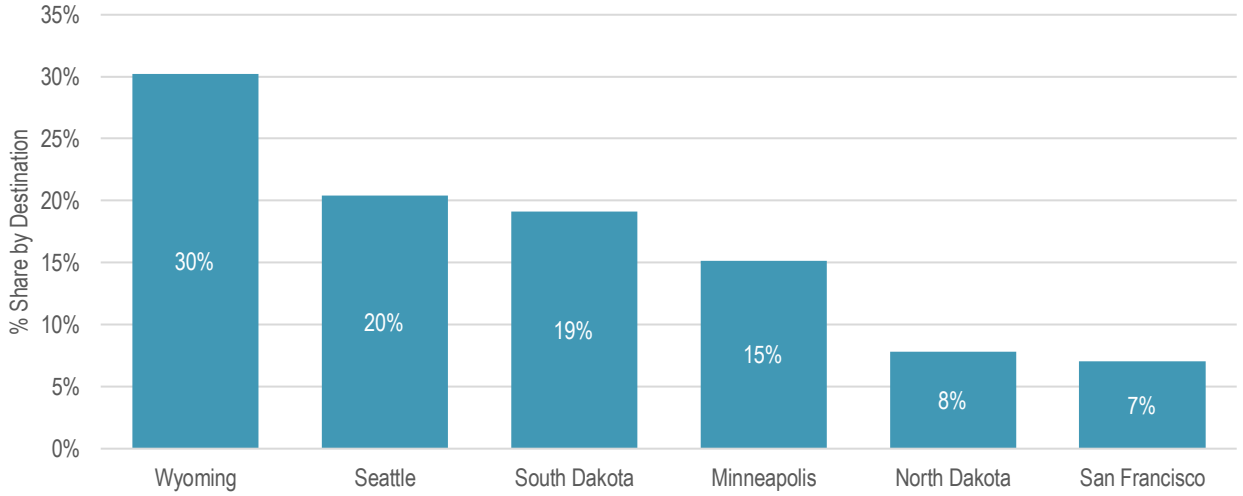
- Wyoming, Seattle, Minneapolis and San Francisco have relatively lower meat supply than Montana, likely contributing to their high share of Montana's outbound meat volume.
- South Dakota and North Dakota, however, have large beef cattle supply but fewer slaughter and production firms than Montana.

Despite meat processing capacity and beef cattle supply, Montana brings in more processed meat volume than it sends out.

Live animals primarily move within Montana or to Idaho by truck.

Nearly all of Montana's outbound live animal volume goes to Idaho by truck.

OUTBOUND DOMESTIC MEAT/SEAFOOD VOLUME: DESTINATION SHARE



Sources: Freight Analysis Framework

Food Manufacturing Overview

Montana's supply of cattle, hogs, meat and grains has fostered a food manufacturing industry, but not on the scale of its neighbors, such as Idaho. Breweries and distilleries are driving growth for Montana's food and beverage manufacturing sector.

Montana's food and beverage manufacturing concentrates around population centers. Beverage manufacturing has been supported by the state's barley supply.

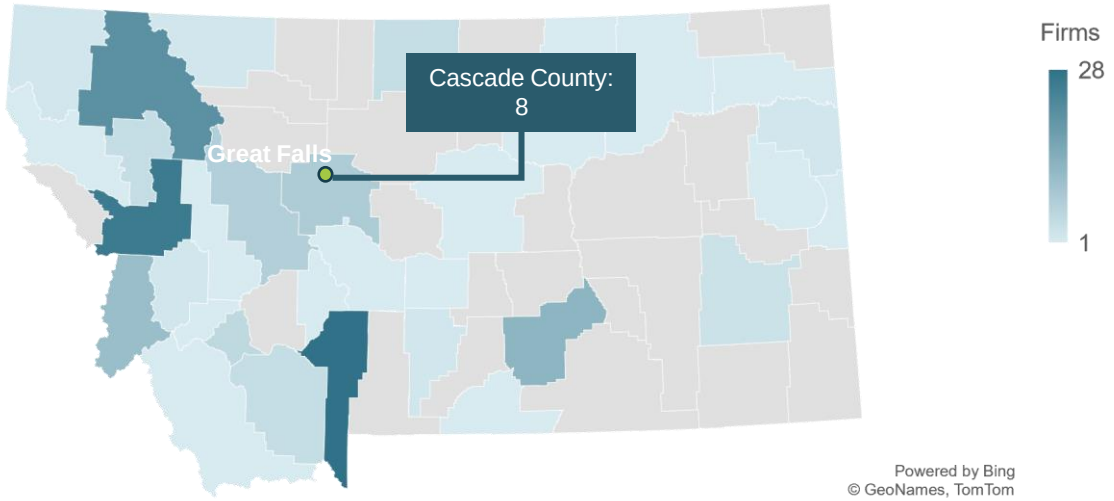
Montana's beverage manufacturing sector predominately consists of breweries and distillers that take advantage of the state's barley supply.

- Breweries and distilleries account for 76% of Montana's beverage manufacturing firms and 59% of beverage manufacturing employment.
- Dairy product manufacturing, including milk, is not heavily concentrated in Montana.

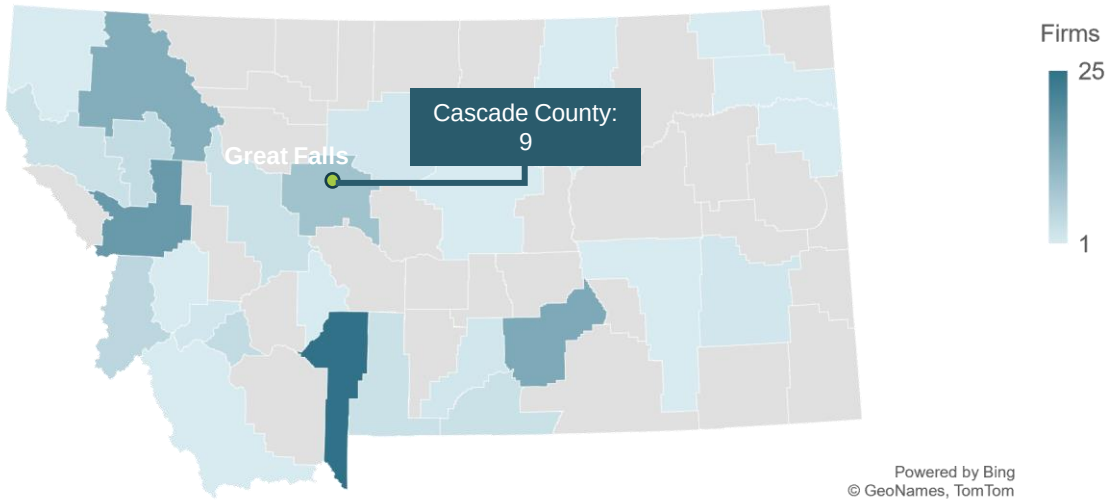
Cascade County has both milling and meat processing operators.

- Montana mills wheat and grains to produce flours, malt and mixes. Commercial bakeries are mostly found in Yellowstone and Missoula counties.
  - Mills account for 8% of Montana's food manufacturing firms.
  - Montana has retail and commercial bakeries, as well as cookie, pasta and dough manufacturers in Gallatin and Cascade.
- Meat processing and egg production support food manufacturing in Montana and nearby states.
  - Animal slaughter and meat processing account for about 34% of the state's food manufacturing firms.

BEVERAGE MANUFACTURING FIRMS BY COUNTY



FOOD MANUFACTURING FIRMS BY COUNTY (EXCL. MEAT AND MILLING)



Sources: Bureau of Labor Statistics

Food Manufacturing Overview

Montana is primarily engaged at the beginning of the food supply chain. Developing a more diverse and robust food manufacturing sector could increase freight flows but may prove difficult due to the attractiveness of manufacturing food in other nearby states.

Montana is primarily engaged at the beginning of the food supply chain.

The state produces grains, flours and meats as well as baked products such as pasta. Food production that involves a wider variety of inputs, such as frozen foods, does not concentrate in Montana. However, neighboring states appear to have more robust food product manufacturing, including Idaho.

- Food products farther down the supply chain often rely on transportation to source inputs and deliver final products.
- This may include railing grains and cooking oils from other US regions, moving refrigerated containers and engaging international markets through maritime ports.
- Despite having equal population size, Idaho is a larger food product manufacturer. This may be due to the state's wider variety of agriculture inputs, including soft and hard wheat and meat and diary products. Additionally, the state is closer to population centers on the West Coast.
    - Food manufacturers in Idaho include Chobani (Yogurt, Dairy), Frulact (Fruit Products), Clifbar (Baked Snacks), AgriBeef (Meat).

Great Falls has received interest from upstream food manufacturers in recent years, with mixed results.

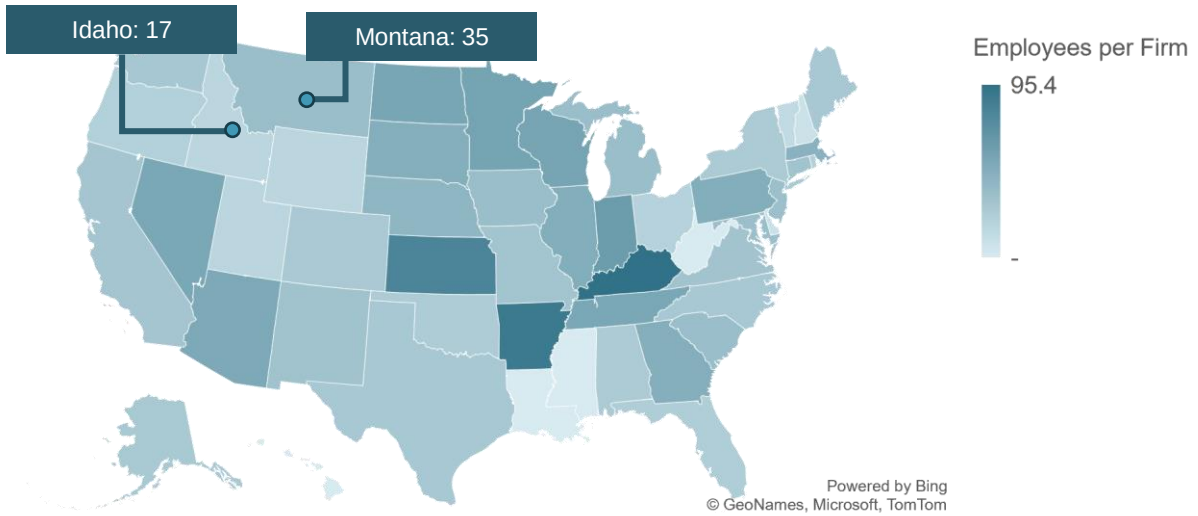
In 2017, Friesen Foods LLC approached Great Falls to build a large food manufacturing park near the city incorporating slaughter, dairy production and distilling. The proposal faced strong public opposition and but ultimately received approval.

- In the last year, a cheese manufacturer and distiller have sought funding to build facilities on the site. Big Sky Cheese has since encountered difficulties servicing its debts, raising questions around the project, which remains in development.

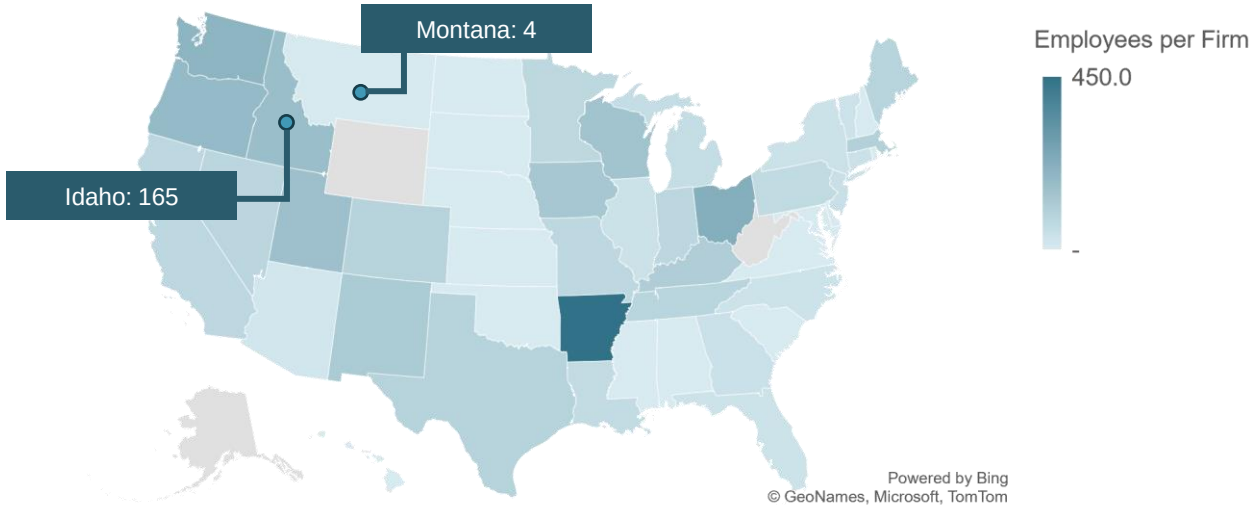
Also in 2017, Montana Eggs began operating a chicken egg sorting facility in Great Falls.

Overall, despite apparent supply of cattle, meat and grains, Montana does not have a particularly robust food manufacturing industry.

COMMERCIAL BAKERIES EMPLOYEES PER FIRM



FROZEN FOOD MANUFACTURING EMPLOYEES PER FIRM



Sources: Bureau of Labor Statistics, Idaho Commerce, Associated Press The Electric, Great Falls Montana Development Authority

Food Manufacturing Overview

Outbound food products rely on trucks and rail to reach more distant markets and rely solely on trucks for transport to nearby Idaho and Wyoming.

Food leaves Montana on truck, multiple modes and rail depending on the distances of destination markets. Inbound volume to Montana almost entirely arrives by truck.

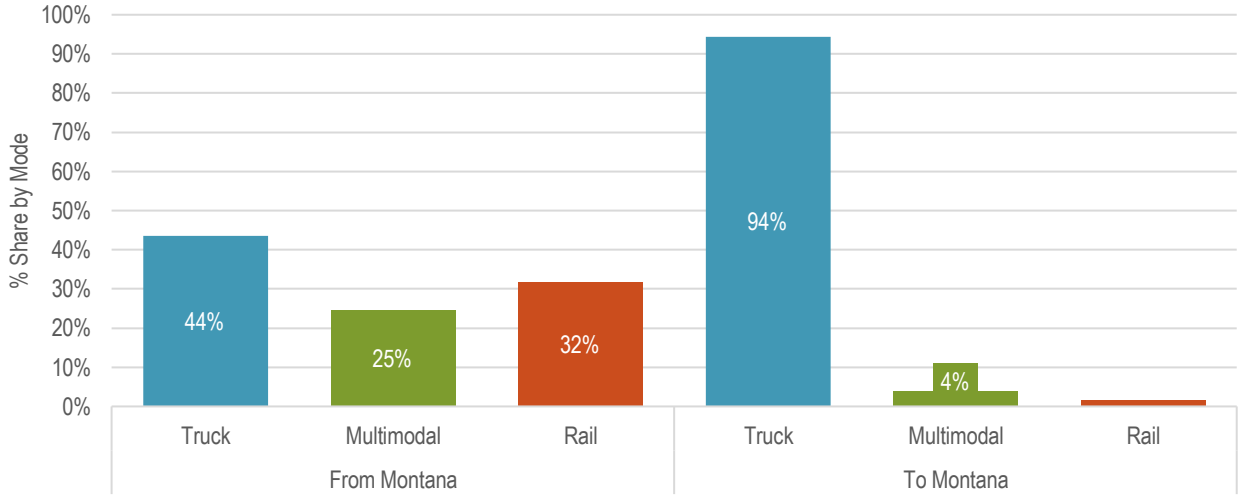
94% of food products entering Montana arrive by truck.

- Food products refer to "other foodstuffs," including milk and dairy products, frozen vegetables and jams, beverages, sugar products, processed sauces and fats and oils.
- 62% of Montana's inbound food products come from Idaho by truck. Other key suppliers include Seattle (possibly imported through the port), South Dakota, Wyoming, other parts of Washington State and Utah.
    - Nearly all of Montana's inbound food product flows come from the Western US as opposed to the Gulf or East Coast.

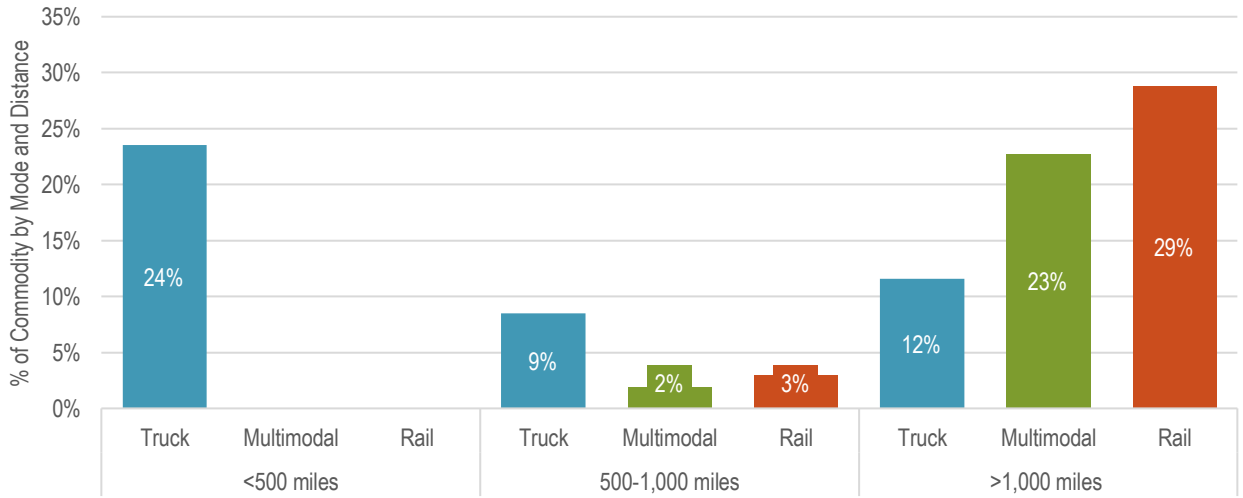
Outbound food products use trucks, multiple modes and rail depending on the distances of destination markets, which range from nearby Idaho to Chicago and Texas.

- To reach destinations within 500 miles, including Idaho, Wyoming and North Dakota, Montana transports food products almost entirely by truck.
    - Short distance trucked volume accounts for a sizeable 25% share of Montana's total outbound food tonnage.
- Conversely, reaching destinations farther than 1,000 miles tends to involve multiple modes and rail as opposed to truck only.
    - Montana's food products are transported by rail and multiple modes to West Coast and Midwest markets such as Chicago and Illinois, Milwaukee, Kansas, Texas, Los Angeles and California.

OUTBOUND VS INBOUND DOMESTIC FOOD PRODUCT VOLUME BY MODE



OUTBOUND DOMESTIC FOOD PRODUCT VOLUME: DISTANCE AND MODE SHARE



Sources: Freight Analysis Framework

Metal Product Manufacturing Overview

Montana's population centers, including Great Falls, bring in steel from other states to manufacture structural metal products and precision parts.

Metal and steel fabrication firms operate near Montana's population centers.

The largest metal fabricating industries include structural steel, producing steel beams and other metal shapes used in construction projects, and machine shops engaged in precision parts and welding often to support machinery manufacturing.

- Yellowstone (Billings), Gallatin (Helena and Butte) and Flathead counties have prominent fabricated metal manufacturing industries.
- Though not as large as other counties, Cascade County has a sizeable structural base metal manufacturing industry.

Importantly, Montana does not produce primary steel products and must bring in steel from other US states.

Great Falls has steel distributors, fabricators and precision parts manufacturers.

Pacific Steel distributes steel throughout the Western US. It has seven steel distributing locations throughout Montana, including one in Great Falls.

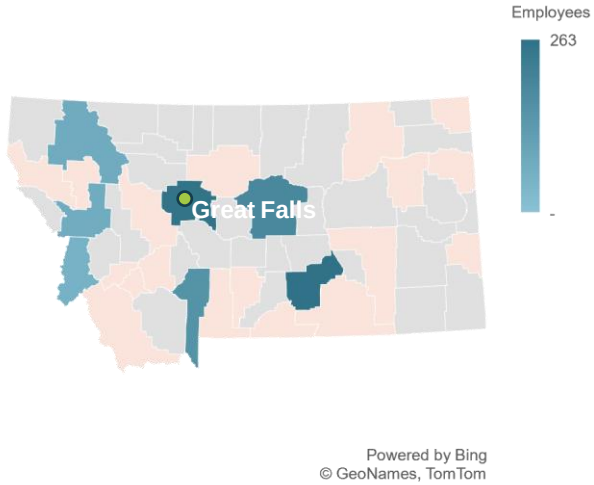
ADF International is a Canadian architectural steelmaker operating in Great Falls. The company provides complex metal frames and heavy steel used in construction and infrastructure projects.

- ADF International does not have direct rail connectivity.

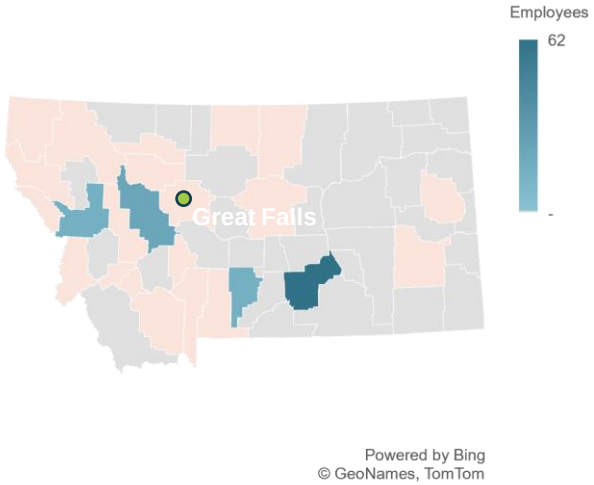
Anderson Steel is a metal fabrication firm producing a variety of goods from steel rebar to ornamental steel products such as stair railings.

Wardjet Cutting Technologies operates near the Great Falls rail yard. This machine shop produces complex parts using proprietary cutting and welding systems. Clients include aerospace/defense and industrial companies.

ARCHITECTURAL, STRUCTURAL BASE METAL MANUFACTURING EMPLOYEES BY COUNTY (2023)



MACHINE SHOP EMPLOYEES BY COUNTY (2023)



GREAT FALLS STEEL AND METAL FIRMS

Sources: Bureau of Labor Statistics, Google Maps, Pacific Steel and Recycling, ADF International, Anderson Steel, Wardjet Technologies

Metal Product Manufacturing Overview

Great Falls metal fabrication firms appear to rely on truck and rail. The large ADF International site is a notable exception (highway connection only).

WARDJET CUTTING TECHNOLOGIES: GREAT FALLS SITE

ADF INTERNATIONAL: GREAT FALLS SITE

PACIFIC STEEL: GREAT FALLS SITE

ANDERSON STEEL: GREAT FALLS SITE

Sources: Nearmap

Metal Product Manufacturing Overview

Base metals arrive to Montana from the West and Midwest by truck. Multiple modes are used to source metal from the East and Gulf Coasts. Outbound volume is trucked to nearby end users and also transported to Seattle and Alaska by rail and vessel, respectively.

Inbound base metal, used by construction firms and metal product manufacturers, arrive by truck or multiple modes depending on distance of origin.

Most inbound base metal products entered Montana on trucks. East and Gulf Coast points of origin used multiple modes of transportation.

- Montana sourced 23% of inbound base metal from Salt Lake City, Utah. This may coincide with Pacific Steel also distributing steel in Salt Lake City.
- Other base metal products arrive on trucks from the Pacific Northwest, possibly originating from the Port of Seattle, and steel producing states in the Midwest, such as Indiana (Fort Wayne) and Ohio (Cleveland).
- 13% of Montana's inbound base metal volume arrive from Philadelphia using multiple modes. Similarly, 6% of volume from distant Mobile, Alabama arrived on multiple modes

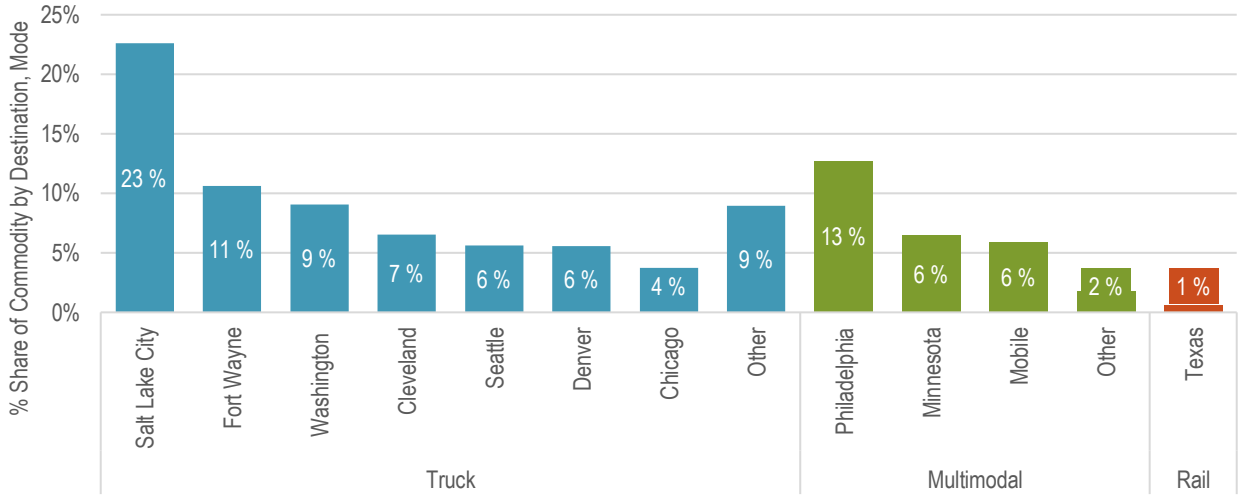
Outbound base metal shipments, including structural products made in Montana, primarily leave the state on multiple modes to Seattle and by truck to Portland.

Volume to Portland and Seattle, two major construction markets and port cities, accounted for 82% of outbound base metal volume.

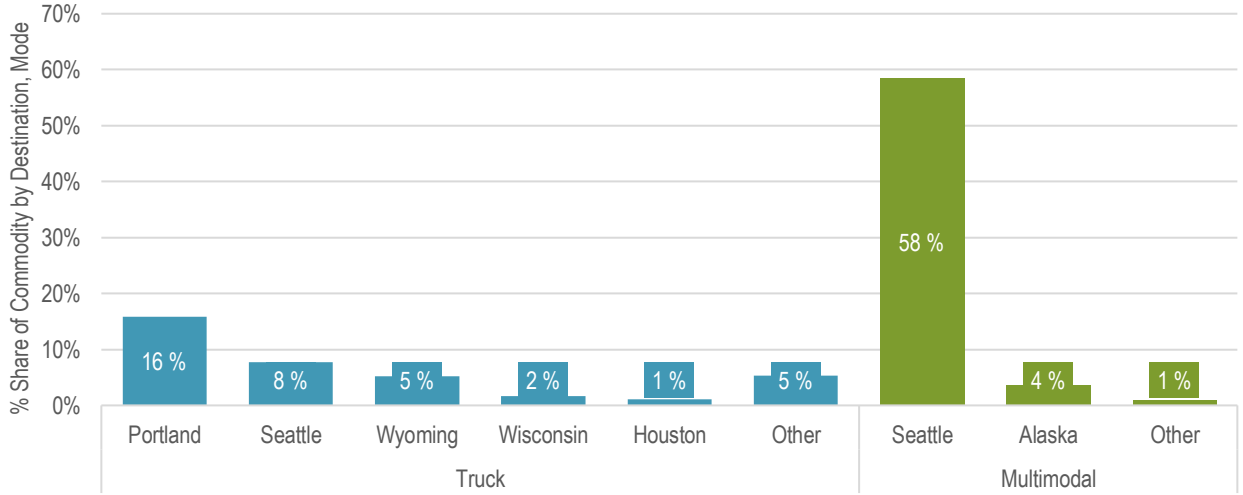
- Manufacturers likely use rail and truck to reach Seattle and Portland.

Montana also transports base metal products to Alaska, likely via a maritime port in the Pacific Northwest. Anderson Steel's website specifically mentions steel shipments to markets in Alaska and Hawaii.

INBOUND BASE METAL VOLUME: ORIGIN AND MODE SHARE



OUTBOUND BASE METAL VOLUME: DESTINATION AND MODE SHARE



Sources: Freight Analysis Framework

Mining Market Overview

Montana has a rich metallic mining history that is still present and processed within the state. However, the state currently produces a greater share of nonmetallic outbound freight, most notably gravel.

NONMETALLIC AND METALLIC MINING OVERVIEW

Montana has an active metallic mining scene in which they are major producers of palladium, platinum, copper / molybdenum, garnets, gold, and silver. Additionally, the state also produces construction sand and gravel, stone, limestone, talc, clay, and gemstones.

Montana's concentration of stone, gravel, sand, and other non-metallic quarries lie on the western border of the state. Counties with the highest number of mining firms include Flathead, Sanders, Gallatin, and Cascade.

Montana sends a significant portion of its gravel production to Wyoming and North Dakota which is predominantly transported by truck.

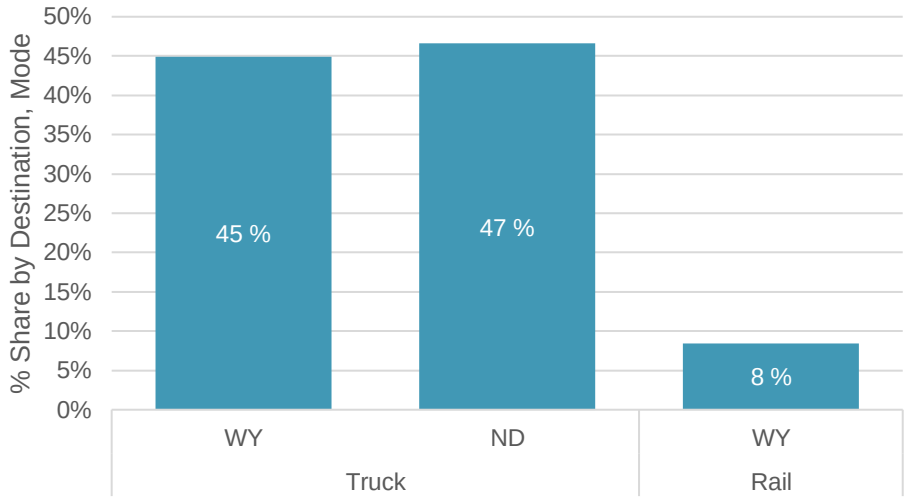
There are two large platinum and palladium mines, Stillwater and East Boulder. These mines are the largest known source of platinum and palladium in the U.S. and have the highest-grade of deposits in the world. The mines total output is comprised of 78% palladium and 22% platinum with production around 500 thousand ounces annually. Platinum is popularly used in jewelry while palladium is used in automobile catalytic converters to help control emissions.

Golden Sunlight mine, one of the largest gold mines in Montana, was recently repurposed in 2022 to transition to mining sulfur in Jefferson county.

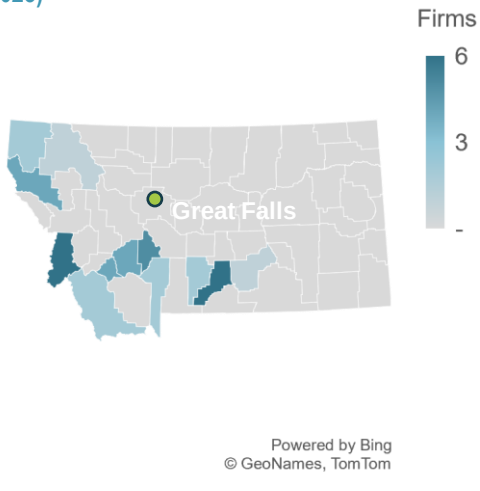
Montana Resources operates Continental mine, the largest copper / molybdenum mine in Butte. The mining operation also consists of crushers and a concentrator facility where the raw ore is processed before shipping out to international markets.

LARGEST QUARRIES & MINES

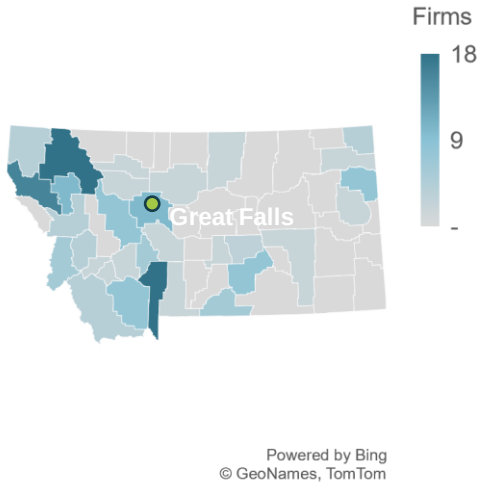
OUTBOUND GRAVEL VOLUME: DESTINATION AND MODE SHARE



COPPER, PLATINUM, PALLADIUM, GOLD, SILVER, AND OTHER METAL MINING FIRMS (2023)



GRAVEL, STONE, AND NONMETALLIC MINERAL MINING FIRMS (2023)



Sources: Montana Resources, Freight Analysis Framework, Sibanye Stillwater, BLS, Google Earth, USGS, Montana Bureau of Mines and Geology

Forestry, Logging and Wood Products Overview

While still present, but to a lesser degree compared to the mid-1900s, logging and wood manufacturing are most prolific on Montana's western border.

Logging and wood product manufacturers overlap in many of the same counties and used to have a much greater industry presence.

Historically, wood products was Montana's largest manufacturing industry, however, the industry has slipped to 4th place in 2022 behind the fabricated metals and food industries due to environmental protection laws.

- Timber harvests have dramatically reduced from around peaks of vigorous harvesting at 1,300 million board feet (MMBF) from the 1960s – 1980s to holding steady under 400 MMBF from 2008 to most recent data in 2018.
- Montana currently has almost 20 million acres of productive, non-reserved timberlands.

Montana has an extensive amount of logging mills most significantly located in the Northwest corner of the state and most concentrated in the Flathead, Lincoln, and Missoula counties.

- Since timber production is a fraction of what it was at its peak, many of the logging plants do not operate near capacity.

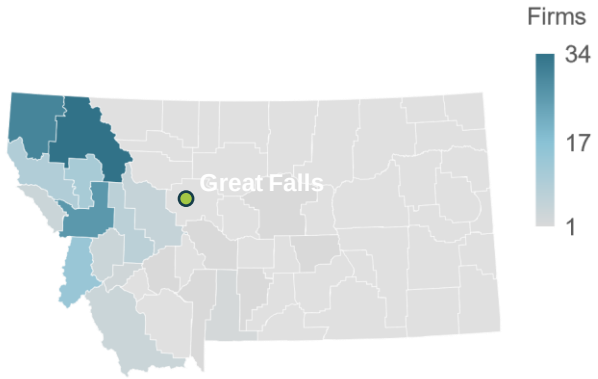
Wood products are a key outbound commodity for Montana and the manufacturing firms are predominantly located in counties on the western border of the state.

- These firms produce a variety of products including lumber, plywood, particleboard, firewood.

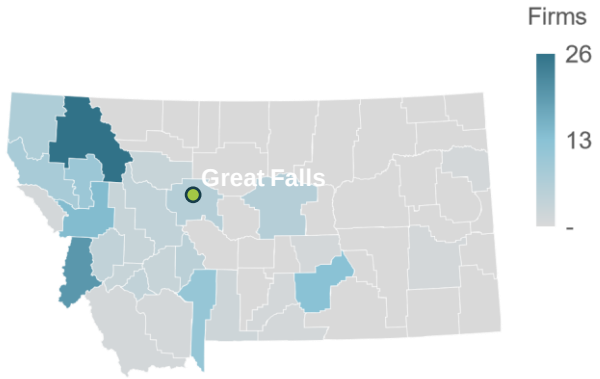
Great Falls has several furniture manufacturers.

Furniture manufacturing firms reside in many of the same counties as wood product manufacturers, for example, Flathead, Gallatin, and Cascade.

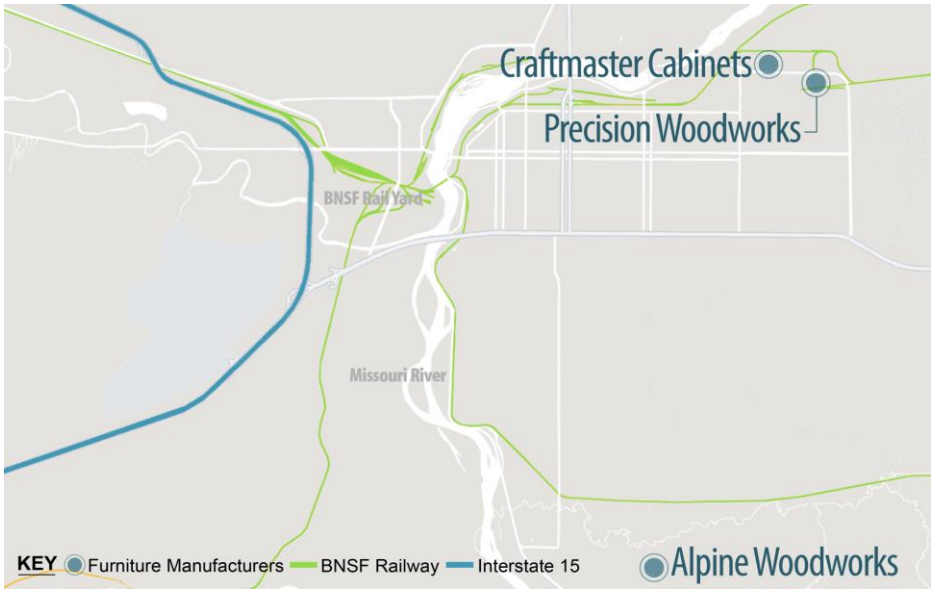
LOGGING FIRMS (2023)



WOOD PRODUCTS MANUFACTURING FIRMS (2023)



FURNITURE MANUFACTURERS IN GREAT FALLS



Sources: The Montana Department of Natural Resources & Conservation, 2022 Montana Manufacturing Report, Bureau of Business and Economic Research

Disclaimer

Moffatt & Nichol devoted effort consistent with (i) the level of diligence ordinarily exercised by competent professionals practicing in the area under the same or similar circumstances, and (ii) the time and budget available for its work, to ensure that the data contained in this report is accurate as of the date of its preparation. This study is based on estimates, assumptions and other information developed by Moffatt & Nichol from its independent research effort, general knowledge of the industry, and information provided by and consultations with the Client and the Client's representatives. No responsibility is assumed for inaccuracies in reporting by the Client, the Client's agents and representatives, or any third-party data source used in preparing or presenting this study. Moffatt & Nichol assumes no duty to update the information contained herein unless it is separately retained to do so pursuant to a written agreement signed by Moffatt & Nichol and the Client.

Moffatt & Nichol's findings represent its professional judgment. Neither Moffatt & Nichol nor its respective affiliates, makes any warranty, expressed or implied, with respect to any information or methods disclosed in this document. Any recipient of this document other than the Client, by their acceptance or use of this document, releases Moffatt & Nichol and its affiliates from any liability for direct, indirect, consequential or special loss or damage whether arising in contract, warranty (express or implied), tort or otherwise, and irrespective of fault, negligence and strict liability.

This report may not to be used in conjunction with any public or private offering of securities, debt, equity, or other similar purpose where it may be relied upon to any degree by any person other than the Client. This study may not be used for purposes other than those for which it was prepared or for which prior written consent has been obtained from Moffatt & Nichol.

Possession of this study does not carry with it the right of publication or the right to use the name of "Moffatt & Nichol" in any manner without the prior written consent of Moffatt & Nichol. No party may abstract, excerpt or summarize this report without the prior written consent of Moffatt & Nichol. Moffatt & Nichol has served solely in the capacity of consultant and has not rendered any expert opinions in connection with the subject matter hereof. Any changes made to the study, or any use of the study not specifically identified in the agreement between the Client and Moffatt & Nichol or otherwise expressly approved in writing by Moffatt & Nichol, shall be at the sole risk of the party making such changes or adopting such use.

This document was prepared solely for the use by the Client. No party may rely on this report except the Client or a party so authorized by Moffatt & Nichol in writing (including, without limitation, in the form of a reliance letter). Any party who is entitled to rely on this document may do so only on the document in its entirety and not on any excerpt or summary. Entitlement to rely upon this document is conditioned upon the entitled party accepting full responsibility and not holding Moffatt & Nichol liable in any way for any impacts on the forecasts or the earnings from the Project resulting from changes in "external" factors such as changes in government policy, in the pricing of commodities and materials, price levels generally, competitive alternatives to the project, the behavior of consumers or competitors and changes in the owners' policies affecting the operation of their projects.

This document may include "forward-looking statements". These statements relate to Moffatt & Nichol's expectations, beliefs, intentions or strategies regarding the future. These statements may be identified by the use of words like "anticipate," "believe," "estimate," "expect," "intend," "may," "plan," "project," "will," "should," "seek," and similar expressions. The forward-looking statements reflect Moffatt & Nichol's views and assumptions with respect to future events as of the date of this study and are subject to future economic conditions, and other risks and uncertainties. Actual and future results and trends could differ materially from those set forth in such statements due to various factors, including, without limitation, those discussed in this study. These factors are beyond Moffatt & Nichol's ability to control or predict. Accordingly, Moffatt & Nichol makes no warranty or representation that any of the projected values or results contained in this study will actually be achieved.

This study is qualified in its entirety by, and should be considered in light of, these limitations, conditions and considerations.

moffatt & nichol

Moffatt & Nichol, New York
529 5th Avenue, New York, NY 10017
T +1 (212) 768-7454
mncommercialgroup@moffattnichol.com
moffattnichol.com