Assessments of the Value the Region Is Receiving from Current Exchanges

Analysis of the S&P Global Transearch Data for Freight Flow Contribution

Description of the Transearch Data

UNLV's Center for Business and Economic Research (CBER) analyzed freight data from S&P Global's Transearch database in order to get a comprehensive understanding and forecast of freight flows through, to, from, and within Clark County, NV on an annual basis. The database presents information on the origins and destinations of these flows, categorized by the Standard Transportation Commodity Code (STCC), across seven different modes of transportation. Note that STCCs can be depicted at 2-digit, 3-digit, 4-digit, or 5-digit levels.

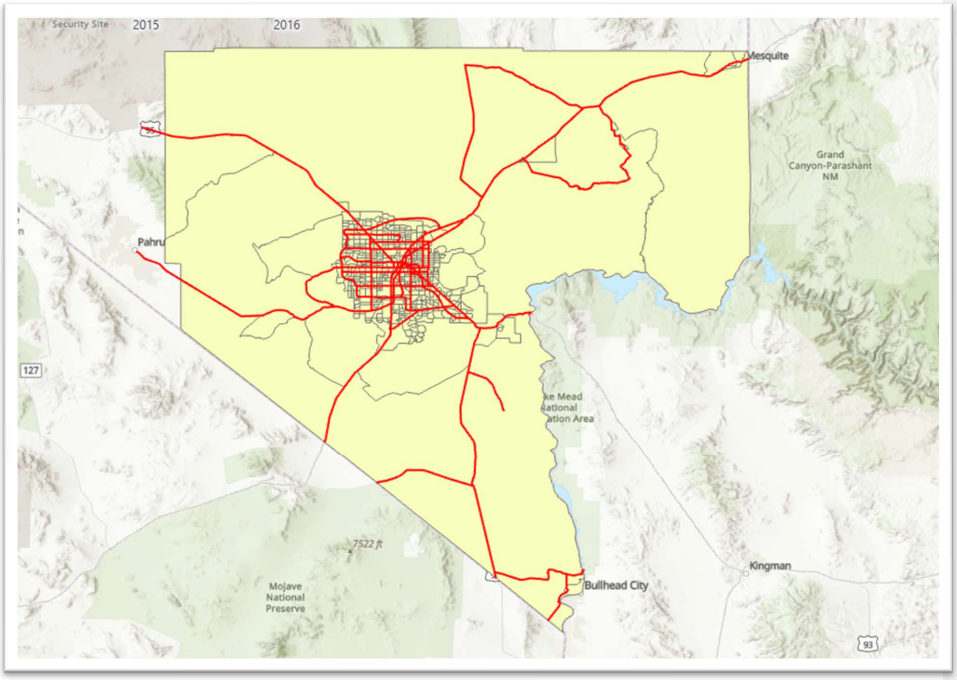
Table 1: 2-digit Standard Transportation Commodity Codes: The highest aggregate of commodity codes

STCC	DESCRIPTION	STCC	DESCRIPTION
01	Aericultural Production & Livestock	32	Clav. Concrete. Glass or Stone
08	Primary Forest Products	33	Primary Metal Products
09	Fresh Fish or Marine Products	34	Fabricated Metal Products
10	Metallic Ores	35	Machinery
11	Coal	36	Electrical Equipment
13	Crude Petroleum or Natural Gas	37	Transportation Equipment
14	Nonmetallic Minerals	38	Instruments, Photo Equip, Optical Eq
19	Ordnance or Accessories	39	Miscellaneous Manufacturing Products
20	Food or Kindred Products	40	Waste or Scrap Materials
21	Tobacco Products	41	Miscellaneous Freight Shipments
22	Textile Mill Products	42	Shipping Trailers/Containers
23	Apparel or Related Products	43	Mail or Contract Traffic
24	Lumber or Wood Products	44	Freight Forwarder Traffic
25	Furniture or Fixtures	45	Shipper Association Traffic
26	Pulp, Paper or Allied Products	46	Miscellaneous Mixed Shipments
27	Printed Matter	47	Small Packaged Freight Shipments
28	Chemicals or Allied Products	48	Waste Hazardous Materials
29	Petroleum or Coal Products	49	Hazardous Materials or Substances
30	Rubber or Miscellaneous Plastics	50	Secondary Traffic[1]
31	Leather or Leather Products		

The Transearch database mainly focuses on the data from Clark County, NV (Federal Information Processing Standards (FIPS) code 32003) for the years 2015, 2019, 2021, and the projected data for 2050.

The data consists of freight flows aggregated to the 1995 Business economic areas (BEAs), allowing summarization of the data for flows that originate or are destined for the reference area. Additionally, filtering out the referenced site as the origin and destination provides for analysis of the commodities and flows that travel through Clark County, NV.

Figure 1: Collection Area Clark County, NV



Note: Red lines identifies the routes used to collect the data for commodities traveling to, from, and through Clark County. The beige area underneath the red streets is Clark County, NV, with all 535 Clark County, NV census tract areas outlined in black.

Brief description of the data used, primarily values and tons.

The database includes a series of 'field' names. The 'tons' field primarily quantifies freight flows. Specifically, these flows are measured in 'short tons,' a unit of weight equivalent to 2000 pounds (approximately 907.19 kilograms). Furthermore, these are net tons, referring to the actual cargo's weight, excluding the transport vehicle's weight. For example, if a truck that weighs 3 tons is carrying 5 tons of cargo, the net tons of the commodity flow would be 5 tons. When a truck is empty, no cargo weight exists to report, so the 'tons' field is marked as zero.

The 'value' field in the Transearch database provides a monetary evaluation of the transported commodities. This field includes the total monetary value of the transported goods, measured at their point of origin for domestic and export flows or at their point of entry. The valuation is performed using an estimation methodology that considers the commodity type (as determined by the STCC) and the state from which the commodity originates.

The amounts in the 'Value' field are denoted in U.S. dollars, and these dollar amounts are indexed to match the corresponding year of the freight flow data. This alignment with the economic conditions of the year in question is crucial for maintaining the accuracy of the data across different years, as it accounts for inflation and other economic factors that can affect the value of goods over time. For example, if a load of a particular commodity was transported from Nevada in 2015, the 'Value' field would represent the total estimated value of that commodity, given its type and origin, in 2015 U.S. Dollars. The significance of this indexing lies in aligning the monetary assessment with the specific economic conditions of that year, thus reflecting the actual value of the goods, considering inflation or other economic factors for that particular year. By doing so, it contributes to a consistent understanding of the value across different time periods.

Statewide Freight Commodity Flows

Aggregation of Transearch data generates the freight activity moving to, from, and through Clark County, NV. The total commodity flows value for the years 2015, 2019, 2021, and 2050, respectively, came out to $164.3 billion, $157.9 billion, $159.6 billion, and $275.3 billion, and the total tonnage for the year equaled, 90.6 million tons, 89.5 million tons, 89.2 million tons, and 127.9 million tons. The data show that the pandemic did play a role in freight movement through Clark County, NV. As of 2021, the value of flows was 2.85 percent below pre-pandemic levels, and total tonnage was down 1.59 percent. From 2015 to 2019, the total average miles for the years, however, did increase from 446.5 thousand miles to 447.1 thousand miles, while total units fell from 5.92 million to 5.86 million, indicating goods traveled further, possibly due to businesses finding alternative suppliers extending beyond existing transportation routes, requiring commodities to travel from further locations. Additionally, the supply shortages may have caused the transportation of more partially filled cargo/freight loads.

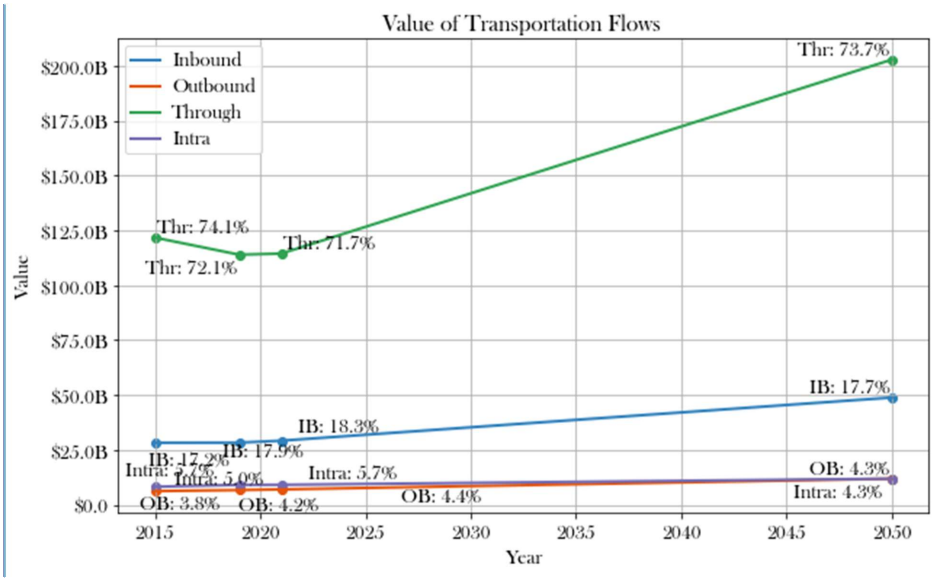
Four primary filters were applied to analyze the directional flows of freight and are given the following nomenclature for this study: outbound, inbound, through, and intra.

Description of the main directional flow categories:

1. **Outbound**: This filter selects the data where the origin is Clark County, NV, and the destination is not Clark County, NV. It represents the transportation flows leaving Clark County.

2. **Inbound**: This filter selects the data where the destination is Clark County, NV, and the origin is not Clark County, NV. It represents the transportation flows coming into Clark County.
3. **Through**: This filter selects the data where neither the origin nor the destination is Clark County, NV. It represents the transportation flows passing through but not originating or terminating in Clark County.
4. **Intra**: This filter selects the data where both the origin and destination are in Clark County, NV. It represents transportation flows within Clark County.

Figure 2: Total Value (Y-axis) for the year range (X-axis), proportion of freight flow by direction shown in percentages.



Note: legend and corresponding colors for Inbound (IB), Outbound (OB), Through (Thr), and Intra.

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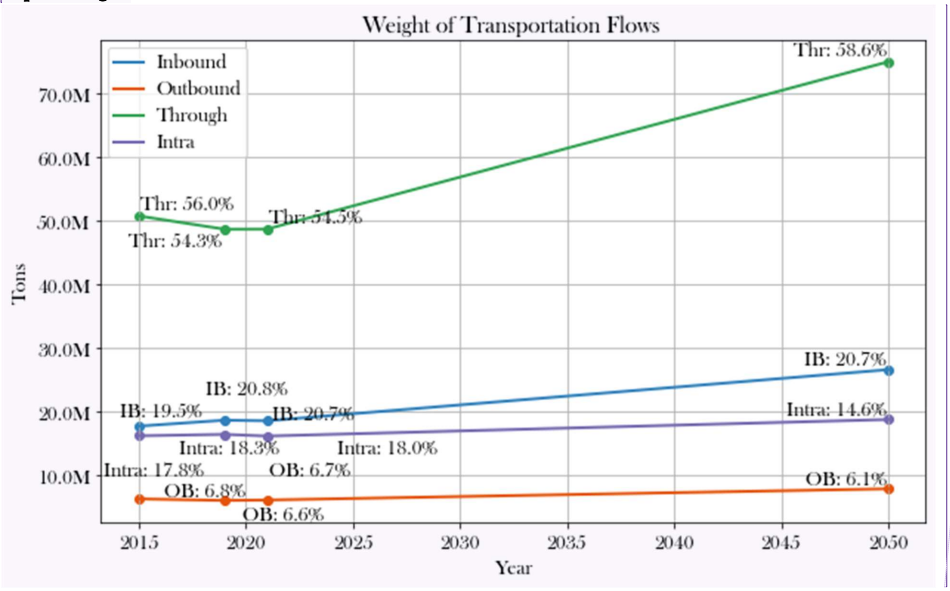
Figure 3: Total Tonnage (Y-axis) for the year range (X-axis), proportion of freight flow by direction shown in percentages.



Note: legend and corresponding colors for Inbound (IB), Outbound (OB), Through (Thr), and Intra

In terms of freight traffic, the Clark County area has experienced a diverse trend across various categories - Inbound (IB), Outbound (OB), Through (Thr), and Intra - over the years from 2015 to 2050, based on the data on tons and value.

The analysis of freight traffic value showed a consistent increase across all categories through 2050. Notably, Inbound traffic's value is projected to grow by around 73 percent, from roughly $28.22 billion in 2015 to $48.83 billion in 2050. The proportion of Inbound value, however, will experience a minor increase from 17.18 percent to 17.73 percent during the same period.

On the other hand, Outbound traffic is expected to nearly double, increasing by 91 percent to reach $11.85 billion in 2050. Its share also exhibited a slight increase from 3.78 percent to 4.30 percent.

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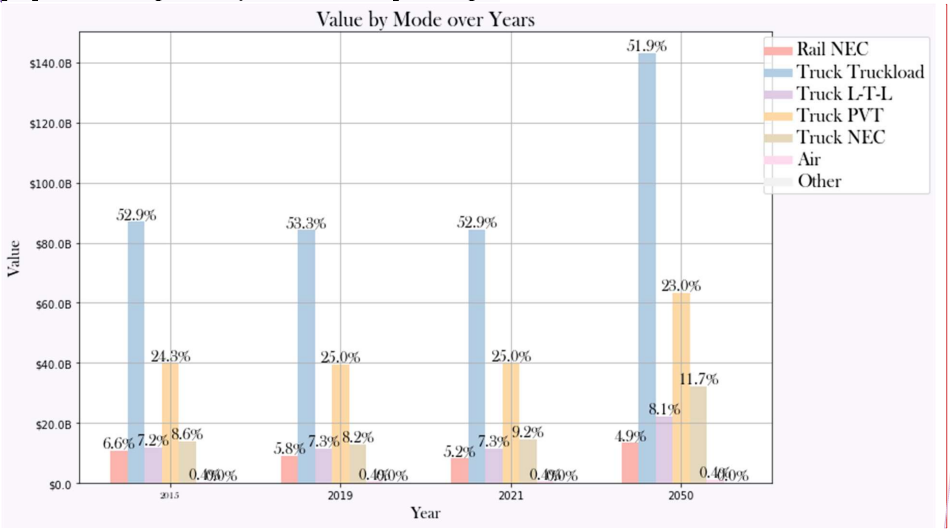
Through traffic, despite showing a significant increase in total value - about 67 percent, from $121.71 billion in 2015 to $202.80 billion in 2050, saw its proportion slightly fall from 74.08 percent to 73.66 percent. Lastly, Intra traffic, while increasing its total value by approximately 45 percent, experienced a drop in its proportion of total traffic from 4.97 percent in 2015 to 4.30 percent in 2050.

Regarding freight tonnage, Through traffic is expected to maintain its dominance in tonnage over the years. Total tonnage is projected to increase by approximately 48 percent, from 50.70 million tons in 2015 to 74.97 million tons in 2050, and slightly expand its share from 55.95 percent to 58.60 percent. Intra traffic is expected to increase by around 16 percent, with a proportion in the total tonnage expected to decrease from 17.77 percent in 2015 to 14.60 percent in 2050. Inbound traffic is projected to grow by approximately 50 percent from about 17.63 million tons in 2015 to 26.52 million tons in 2050. Despite the volume increase, the proportion of Inbound tons is expected to remain relatively steady, slightly increasing from 19.45 percent to 20.73 percent of overall trade. The Outbound traffic showed a contrasting trend. Despite its total tonnage rising by around 26 percent over the period, its share of the total tons saw a dip from 6.82 percent in 2015 to 6.07 percent in 2050. This suggests a relative decrease in Outbound tons compared to Inbound.

While all directional categories observed an increase in both tons and value of freight traffic, the proportion of freight flows that each category type contributed to the total varied over the years. These shifts in proportions could affect strategic planning and investment decisions related to the area's freight transportation infrastructure; as the proportional changes may seem small, they're, in fact, quite significant. For example, Clark County, NV Outbound tonnage decline of 6.82 percent in 2015 to 6.07 percent in 2050. indicates Clark County, NV is forecasted to ship 12.36 percent less than it currently does, revealing a significant shift in local manufacturing/output.

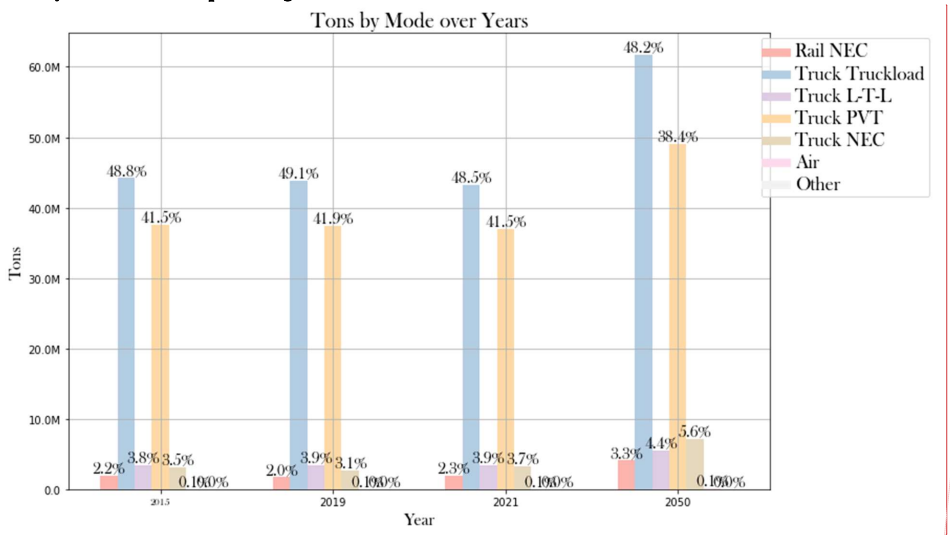
Freight Flows by Mode

Figure 4: Time-Series Bar Chart: Total Value in current dollars (Y-axis) for the year range (X-axis), proportion of freight flow by mode shown in percentages.



Note: percentages may not always add up to 100 percent due to rounding.

Figure 5: Time-Series Bar Chart: Total Tonnage (Y-axis) for the year range (X-axis), proportion of freight flow by mode shown in percentages.



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Note: percentages may not always add up to 100 percent due to rounding.

The Modes depicted and summarized below are for all directions of travel and are unique categories of transportation used to help describe the movement of goods. Each represents a specific type of transport with unique characteristics.

Rail traffic: In 2015, the Rail NEC mode accounted for 2,026,542.37 tons, amounting to about $10.85 billion. This volume increased by 2021, reaching approximately 2 million tons, valued at roughly $8.25 billion. In 2050, the tonnage transported by rail is projected to increase significantly to about 4.2 million tons, amounting to around $13.40 billion. Rail NEC refers to NAFTA (North American Free Trade Agreement) activity moving between the U.S. and Canada or Mexico.

Truck traffic: Truck Truckload in 2015 accounted for the most traffic at 44.2 million tons, valued at approximately $86.93 billion. It slightly decreased by 2021 to 43.2 million tons and a somewhat lower value of $84.50 billion. By 2050, it is projected to increase to 61.7 million tons, amounting to around $142.97 billion. Other truck modes, including Truck L-T-L, Truck PVT, and Truck NEC, also transported significant volumes, with increases expected by 2050. Truck NEC refers to NAFTA traffic only. Truck L-T-L refers to shipments that are smaller than what would otherwise be classified under Truck Truckload, Truck L-T-L can also be seen as a share of freight movement handled by local parcel service carriers like FedEx Ground, UPS, or other mail services.

Air traffic: In 2015, Air traffic accounted for a much lower tonnage of 105.5 thousand tons, valued at approximately $625 million. The volume slightly increased by 2021, reaching about 107.8 thousand tons valued at roughly $648 million. In 2050, the tonnage transported by air is projected to increase to approximately 167.7 thousand tons, amounting to about 1.15 billion dollars.

Other modes: Other transport modes accounted for the smallest share in all years, with tons and value both under 1 million. A small increase, however, is expected by 2050. "Other modes" refers to a miscellaneous category that encompasses various methods of transportation not classified under the main categories of truck, rail, water, air, and pipeline.

Truck Truckload accounts for the highest tonnage and value across all years. The total freight traffic is expected to increase in all modes by 2050. Fluctuations in the data from 2019 to 2021 are due to supply chain issues and shortages onset by the COVID-19 pandemic.

Using the circular bar charts below to visualize the data by mode and its direction gives way to further analysis of trends and projections. The charts represent the transportation statistics for Clark County, NV, across different years and modes of transportation. The modes include Air, Other, Rail NEC, Truck L-T-L,

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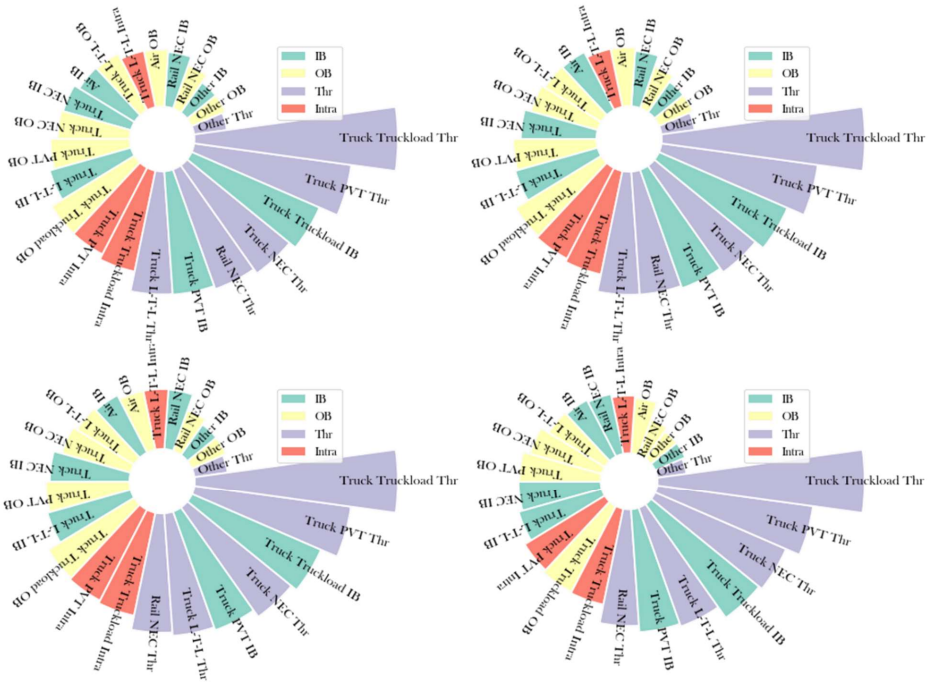
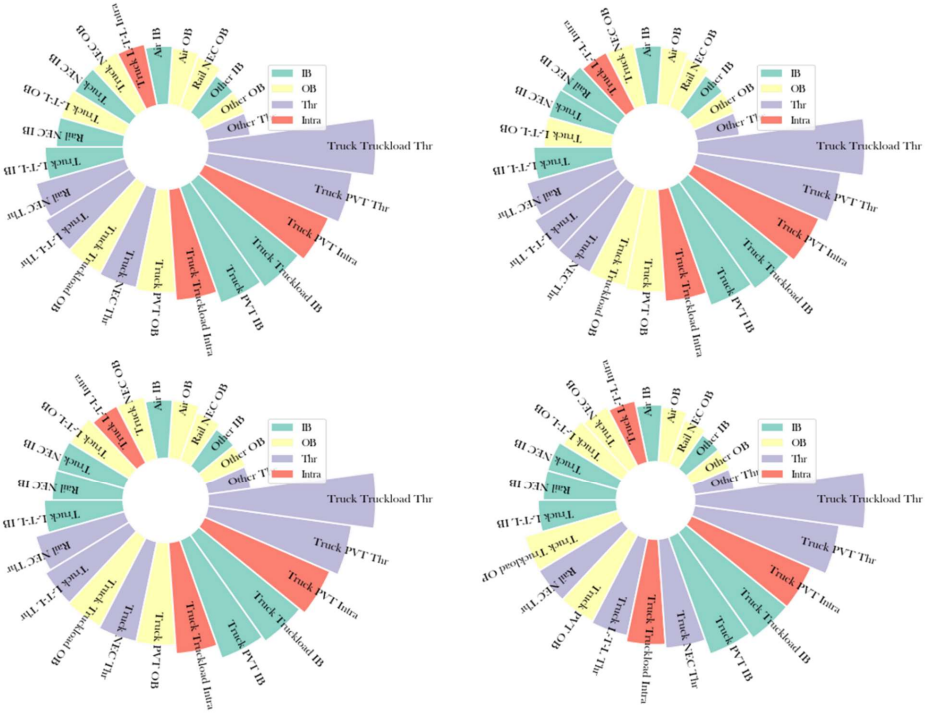
Truck NEC, Truck PVT, and Truck Truckload. The data are broken down into Inbound (IB), Outbound (OB), Through (Thr), and Intra by value (Dollars) and weight (tons).

Figure 6: Circular Bar Chart: Values by mode (labeled), inbound, outbound, through and intra (color coordinated.



Legend from the top left: Top row: 2015 and 2019; Bottom row: 2021 and 2050. *Values were cube rooted to normalize the distribution for visualization. For example, a value of 1,000,000 has a cube root of $\sqrt[3]{1{,}000{,}000} = 100$; The cube root transformation can make the visual representation more intuitive and less sensitive to extreme values.

Figure 7: Circular Bar Chart: Tons by mode (labeled), Inbound, Outbound, Thr and Intra (color coordinated)



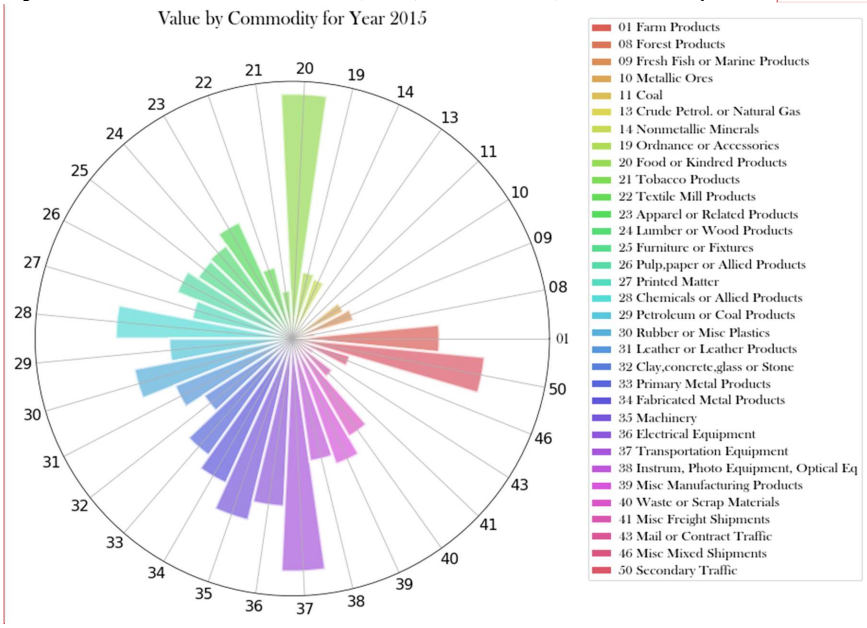
Top row: 2015 and 2019; Bottom row: 2021 and 2050. *Again values were cubed to normalize distribution for visualization.

Based on the circular bar chart values summary, the data suggests a shift in transportation modes in Clark County, NV, over the years. While private trucking (Truck PVT) is becoming more popular for Inbound transportation, the reliance on Rail NEC is declining. Furthermore, less-than-truckload shipping (Truck L-T-L) is increasingly used to transport valuable goods. Truck Truckload consistently had the highest values and tons for Inbound, Outbound, Intra, and Thr categories across all the years.

Commodity Flows

Circular Commodity Charts

Figure 8: Circular Bar Chart Series: 2015, 2019, 2021 and 2050, Commodities by Value.



Note: ("non-standard codes specific to Transearch and pertaining to truck movements: 50 10 for secondary traffic (distribution centers or warehouses to consuming points like retail stores), 50 21 and 50 22 for rail intermodal dray, and 50 31 and 50 32 for air freight dray."[1])

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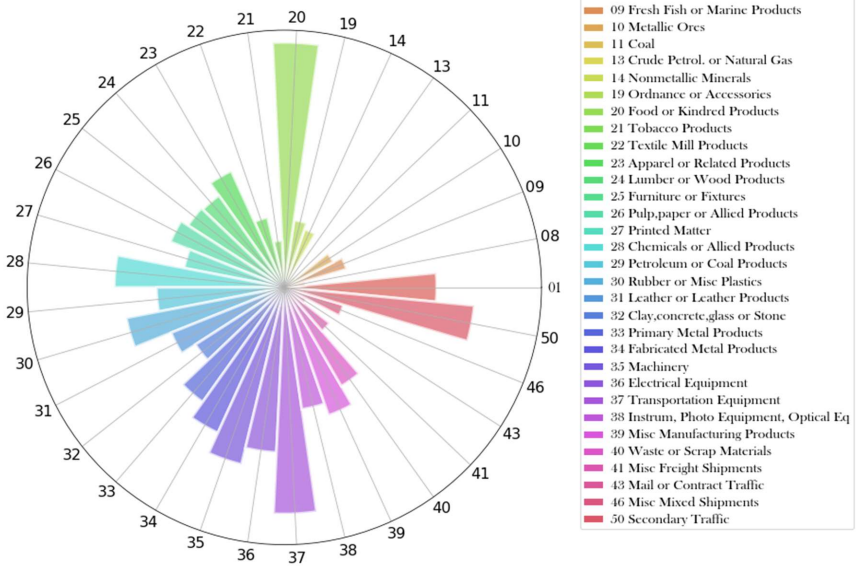
[1] Transearch 2020 Tutorial.pdf

Value by Commodity for Year 2019



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- 08 Forest Products
- 09 Fresh Fish or Marine Products
- 10 Metallic Ores
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- 14 Nonmetallic Minerals
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- 22 Textile Mill Products
- 23 Apparel or Related Products
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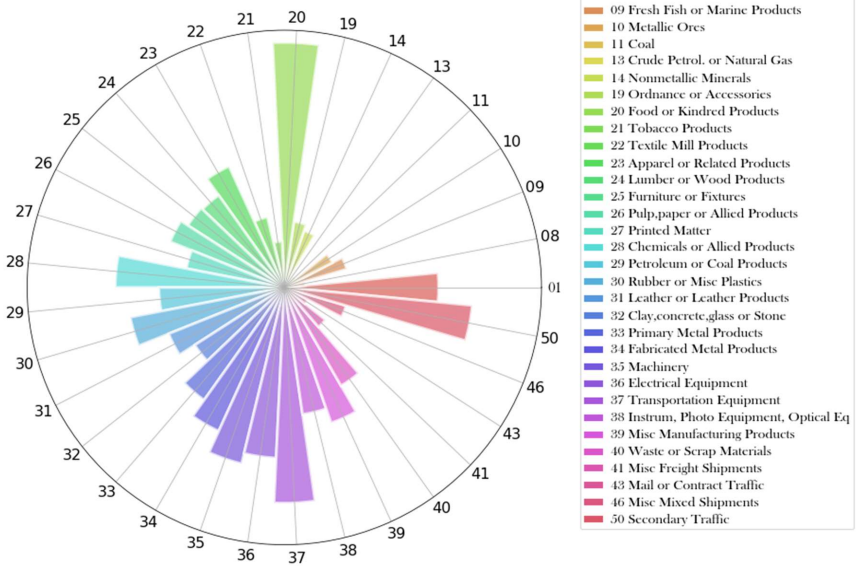
- 46 Misc Mixed Shipments
- 50 Secondary Traffic

Value by Commodity for Year 2021



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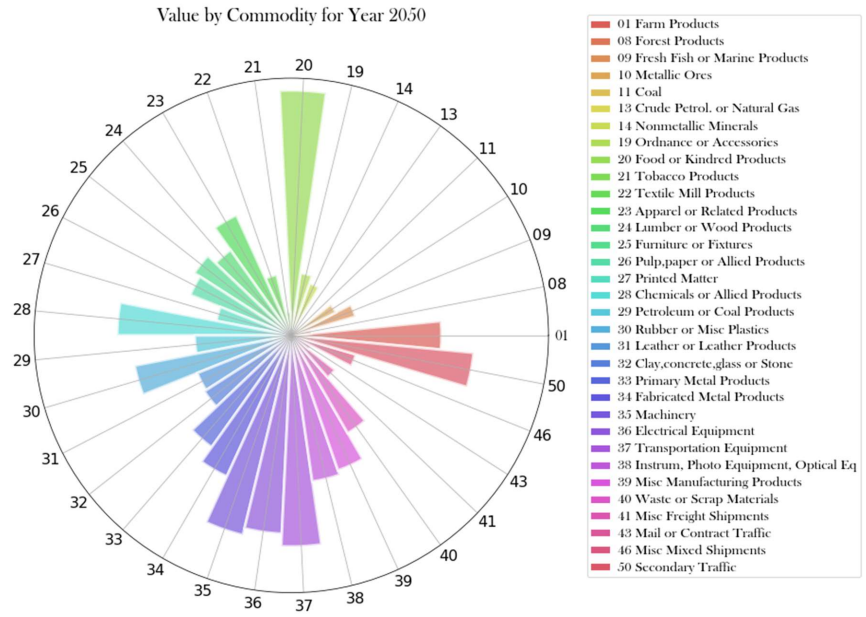
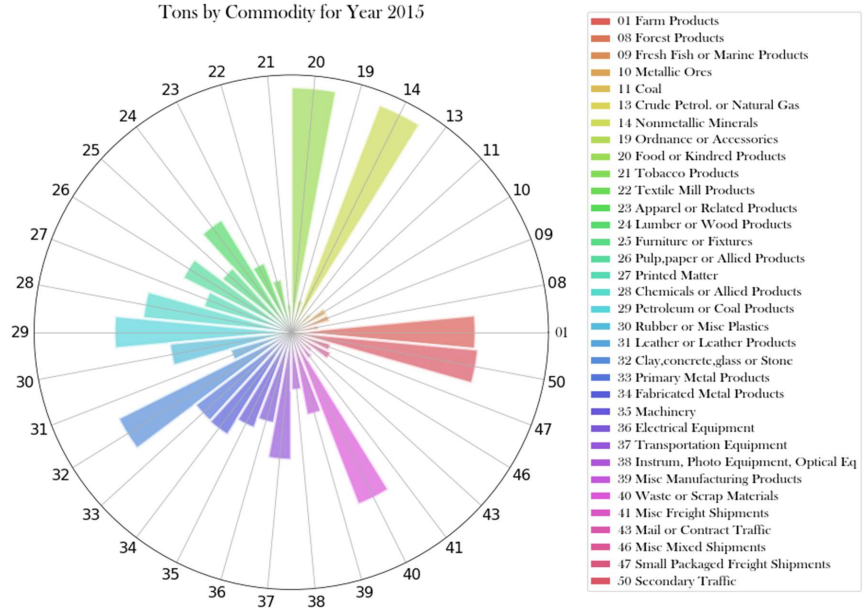
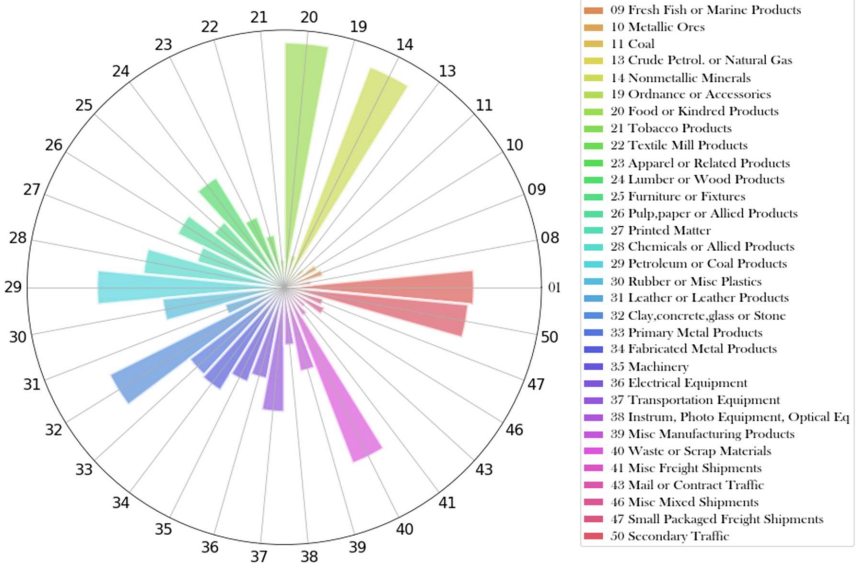


Figure 9: Circular Bar Chart Series: 2015, 2019, 2021 and 2050 Commodities by Tons.



Tons by Commodity for Year 2019



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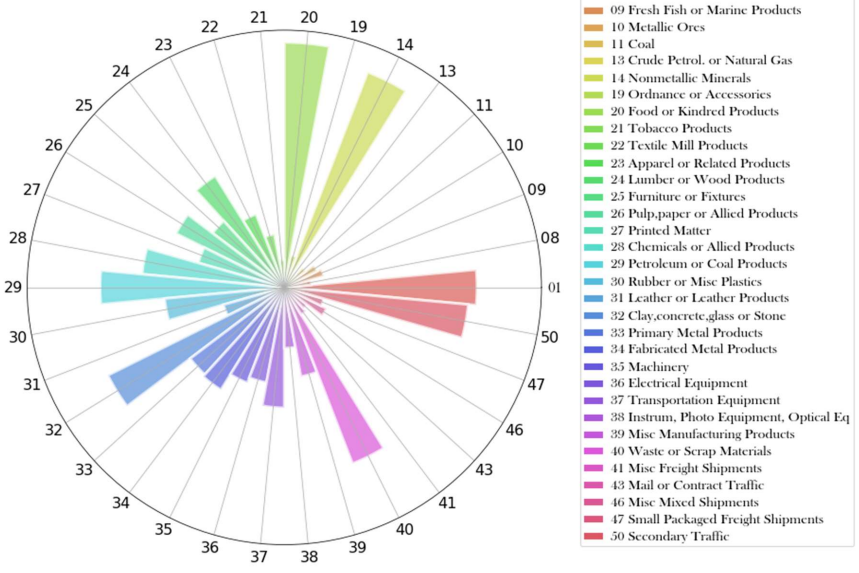
Tons by Commodity for Year 2021



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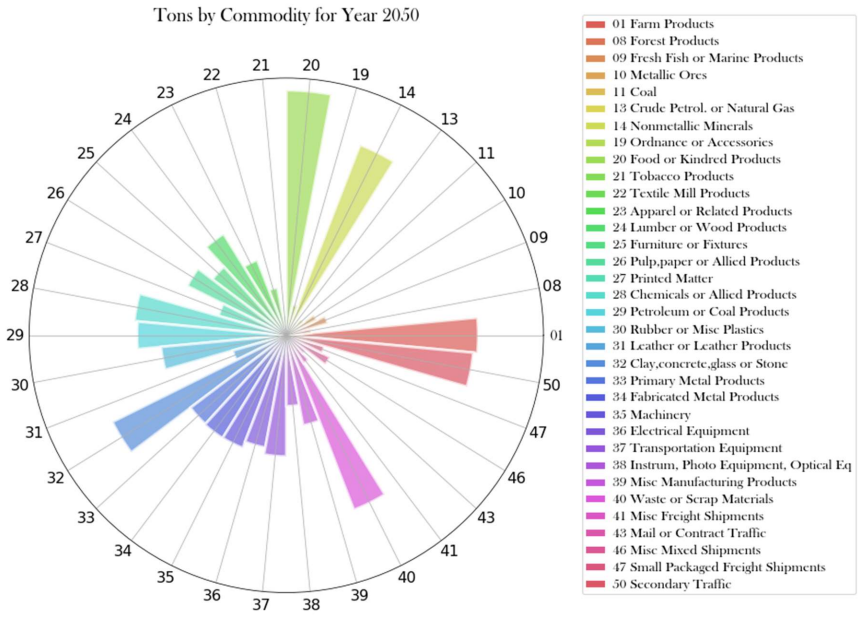


Table 2. 2015 Clark County, NV Freight Flows by Commodity

Table 2 reports the total value and total tons of each commodity for each direction of travel (Outbound, Inbound, Through, Intra), and the corresponding percentages represent the proportion of that specific commodity's contribution to the total freight activity in that direction.

For example, Farm Products represent **0.12 percent** of all 'Outbound freight activity', meaning that the total value of Farm Products contributes to **0.12 percent** of the total value of all commodities that are moving in the Outbound direction. Thus, the sum of values for a percentage column will equal 100 percent of trade for that direction.

Commodity	Total Value	%OB	%IB	%Thr	%Intr	Total Tons	%OB	%IB	%Thr	%Intr
01 Farm Products	$6,074,661,848.00	**0.12**	4.11	4.03	0.01	7,059,514.31	0.55	5.98	11.77	0.01
08 Forest Products	$19,720,442.27	0	0.02	0.01	0	8,334.10	0	0.02	0.01	0
09 Fresh Fish or Marine Products	$487,677,531.40	0	0.71	0.24	0	39,289.20	0	0.08	0.05	0
10 Metallic Ores	$358,215,062.70	0.13	0.24	0.23	0	38,733.72	0.01	0.03	0.06	0

11 Coal	$4,290,320.91	0	0	0	0	5,650.54	0	0	0.01	0
13 Crude Petrol. or Natural Gas	$121,408.69	0	0	0	0	321.29	0	0	0	0
14 Nonmetallic Minerals	$476,274,764.40	0.5	0.22	0.26	0.8	16,969,000.31	34.12	17.73	10.24	40.62
19 Ordnance or Accessories	$569,584,441.70	0.09	0.22	0.41	0.09	17,968.06	0	0.01	0.03	0
20 Food or Kindred Products	$28,068,551,251.00	7.52	14.83	18.88	5.41	17,180,525.82	6.63	14.22	27.36	2.44
21 Tobacco Products	$203,010,143.70	0.07	0.67	0.01	0.02	8,468.01	0.01	0.04	0	0
22 Textile Mill Products	$740,461,064.30	0.64	0.95	0.34	0.24	117,164.08	0.1	0.29	0.11	0.02
23 Apparel or Related Products	$3,964,810,743.00	0.71	2.1	2.7	0.45	364,558.84	0.11	0.36	0.57	0.04
24 Lumber or Wood Products	$2,820,628,335.00	0.56	2.17	1.77	0.28	2,460,020.17	0.3	3.06	3.73	0.05
25 Furniture or Fixtures	$2,699,257,803.00	1.45	1.73	1.7	0.63	625,061.68	0.17	0.62	0.98	0.06
26 Pulp,paper or Allied Products	$3,623,994,647.00	2.07	2.27	2.3	0.65	1,844,716.81	0.92	1.85	2.84	0.14
27 Printed Matter	$2,016,876,025.00	1.43	0.98	1.32	0.61	725,927.63	0.51	0.52	1.15	0.11
28 Chemicals or Allied Products	$10,504,776,799.00	6.08	8.57	6.14	2.95	3,583,884.69	2.5	4.03	5.16	0.64
29 Petroleum or Coal Products	$3,534,891,670.00	5.79	0.6	0.44	30.34	6,200,166.00	8.21	4.63	3.45	19.42
30 Rubber or Misc Plastics	$7,936,072,423.00	9.44	4.71	4.78	2.45	1,892,219.58	2.37	1.81	2.72	0.29
31 Leather or Leather Products	$3,825,904,700.00	0	1.5	2.8	0	208,887.82	0	0.12	0.37	0
32 Clay,concrete,glass or Stone	$2,202,484,100.00	2.4	1.22	1.02	5.67	8,187,315.89	8.69	7.45	5.4	22.35
33 Primary Metal Products	$5,637,132,707.00	2.67	1.98	4.02	0.19	1,805,378.55	0.6	1.07	3.11	0.03
34 Fabricated Metal Products	$7,670,455,170.00	1.68	4.7	5.07	0.84	1,835,282.17	0.4	1.86	2.89	0.11
35 Machinery	$12,443,956,218.00	3.39	3.66	9.19	0.16	1,076,858.23	0.31	0.59	1.88	0.02
36 Electrical Equipment	$9,031,625,917.00	5.94	5.17	5.9	0.31	763,126.74	0.73	0.7	1.17	0.01
37 Transportation Equipment	$24,145,570,534.00	1.35	8.72	17.49	3.81	2,180,835.67	0.11	1.47	3.72	0.18
38 Instrum, Photo Equipment, Optical Eq	$3,586,976,988.00	1.65	2.47	2.28	0.13	150,360.68	0.05	0.17	0.23	0
39 Misc Manufacturing Products	$4,455,002,453.00	12.18	2.39	2.12	5.48	558,259.91	1.71	0.45	0.58	0.47
40 Waste or Scrap Materials	$2,743,385,778.00	7.09	1.2	1.22	5.82	7,121,455.25	24.01	6.67	5.54	10.26
41 Misc Freight Shipments	$246,781,705.40	0.02	0.01	0.2	0	14,324.29	0	0	0.03	0
42 Shipping Containers	$0.00	0	0	0	0	-	0	0	0	0
43 Mail or Contract Traffic	$24,585,651.96	0.1	0.06	0	0	7,150.49	0.03	0.03	0	0
46 Misc Mixed Shipments	$407,993,885.30	0.15	0.27	0.26	0	59,060.84	0.02	0.07	0.09	0
47 Small Packaged Freight Shipments	$0.00	0	0	0	0	44,010.84	0.33	0.13	0	0
50 Secondary Traffic	$13,776,817,423.00	24.78	21.54	2.87	32.66	7,463,501.14	6.51	23.92	4.75	2.72

Table 3 reports the total value and total tons of each commodity for each direction of travel (Outbound, Inbound, Through, Intra), and the corresponding percentages represent the proportion of that specific commodity's contribution to the total freight activity in that direction.

Table 3. 2019 Clark County, NV Freight Flows by Commodity

Commodity	Total Value	%OB	%IB	%Thr	%Intr	Total Tons	%OB	%IB	%Thr	%Intr
01 Farm Products	$6,651,545,771.00	0.11	4.22	4.78	0.01	7,647,703.20	0.48	5.86	13.43	0.01
08 Forest Products	$15,491,725.25	0	0.03	0.01	0	7,372.75	0	0.02	0.01	0
09 Fresh Fish or Marine Products	$500,646,894.30	0	0.67	0.27	0	39,699.23	0	0.07	0.06	0
10 Metallic Ores	$307,002,202.20	0.14	0.24	0.2	0	28,769.02	0.01	0.03	0.05	0
11 Coal	$3,655,209.62	0	0	0	0	5,112.48	0	0	0.01	0
13 Crude Petrol. or Natural Gas	$138,686.94	0	0	0	0	486.5	0	0	0	0
14 Nonmetallic Minerals	$432,696,850.70	0.38	0.23	0.25	0.67	15,275,740.32	22.27	19.13	8.96	37.01
19 Ordnance or Accessories	$577,348,769.40	0.08	0.23	0.44	0.08	17,977.41	0	0.01	0.03	0
20 Food or Kindred Products	$27,758,392,529.00	7.62	14.84	19.83	5.08	16,964,334.85	7.39	13.47	28.05	2.37
21 Tobacco Products	$186,999,059.10	0.1	0.61	0	0.02	7,968.50	0.01	0.04	0	0
22 Textile Mill Products	$689,913,994.90	0.63	0.92	0.32	0.23	112,735.93	0.11	0.28	0.11	0.02
23 Apparel or Related Products	$3,911,941,578.00	0.57	1.8	2.93	0.34	379,455.97	0.1	0.33	0.63	0.03
24 Lumber or Wood Products	$2,676,181,958.00	0.75	2.29	1.71	0.34	2,247,918.13	0.49	3.14	3.34	0.08
25 Furniture or Fixtures	$2,803,610,246.00	2.01	1.86	1.82	0.74	655,264.30	0.27	0.68	1.03	0.07
26 Pulp,paper or Allied Products	$3,449,780,398.00	2.36	2.58	2.19	0.8	1,742,680.66	1.13	2.05	2.6	0.18
27 Printed Matter	$1,975,174,646.00	1.4	0.93	1.38	0.57	708,836.75	0.55	0.46	1.18	0.11
28 Chemicals or Allied Products	$9,241,239,723.00	5.02	8.62	5.47	2.62	3,020,408.34	1.52	3.72	4.48	0.39
29 Petroleum or Coal Products	$3,907,353,365.00	6.73	1.09	0.4	29.74	7,353,042.72	10.77	8.64	3.42	21.11
30 Rubber or Misc Plastics	$7,832,135,467.00	9.93	4.76	4.91	2.54	1,884,229.89	2.82	1.74	2.75	0.34
31 Leather or Leather Products	$3,386,933,261.00	0	1.49	2.6	0	190,595.72	0	0.12	0.35	0
32 Clay,concrete,glass or Stone	$2,199,373,537.00	2.9	1.16	1.06	5.15	8,384,671.21	11.45	6.37	6.16	21.6
33 Primary Metal Products	$5,227,921,619.00	2.41	1.98	3.94	0.17	1,713,647.75	0.62	1.1	3.02	0.03
34 Fabricated Metal Products	$7,666,755,290.00	2.41	4.85	5.29	1.17	1,833,922.63	0.68	1.84	2.93	0.18
35 Machinery	$11,352,699,635.00	3.27	4.6	8.62	0.2	1,024,856.76	0.35	0.69	1.8	0.02
36 Electrical Equipment	$8,464,601,065.00	2.94	5.13	5.96	0.36	763,534.71	0.35	0.82	1.21	0.02
37 Transportation Equipment	$21,916,816,135.00	2.35	8.55	16.53	5.62	1,993,883.54	0.21	1.37	3.45	0.29
38 Instrum, Photo Equipment, Optical Eq	$3,484,069,194.00	1.82	2.48	2.32	0.17	150,521.46	0.07	0.17	0.24	0
39 Misc Manufacturing Products	$4,641,588,991.00	11.41	2.59	2.39	4.67	579,674.83	1.77	0.45	0.65	0.44
40 Waste or Scrap Materials	$2,762,222,820.00	7.07	1.2	1.24	5.97	7,552,150.99	27.29	6.35	5.92	11.49
41 Misc Freight Shipments	$350,283,535.10	0.02	0.01	0.3	0	20,302.32	0	0	0.04	0
42 Shipping Containers	$0.00	0	0	0	0	-	0	0	0	0
43 Mail or Contract Traffic	$25,846,302.88	0.12	0.06	0	0	7,517.13	0.04	0.03	0	0
46 Misc Mixed Shipments	$430,106,410.60	0.13	0.21	0.32	0	61,362.75	0.02	0.05	0.1	0

47 Small Packaged Freight Shipments	$0.00	0	0	0	0	41,374.96	0.32	0.12	0	0
50 Secondary Traffic	$13,078,230,510.00	25.31	19.76	2.49	32.76	7,037,886.55	8.91	20.85	4.01	4.2

Table 4 reports the total value and total tons of each commodity for each direction of travel (Outbound, Inbound, Through, Intra), and the corresponding percentages represent the proportion of that specific commodity's contribution to the total freight activity in that direction.

Table 4. 2021 Clark County, NV Freight Flows by Commodity

Commodity	Total Value	%OB	%IB	%Thr	%Intr	Total Tons	%OB	%IB	%Thr	%Intr
01 Farm Products	$7,061,976,202.00	0.13	4.27	5.08	0.01	8,070,614.40	0.58	6.11	14.2	0.01
08 Forest Products	$15,531,554.10	0	0.02	0.01	0	7,513.35	0	0.02	0.01	0
09 Fresh Fish or Marine Products	$518,790,115.40	0	0.66	0.28	0	42,310.03	0	0.07	0.06	0
10 Metallic Ores	$295,639,036.50	0.13	0.21	0.2	0	27,440.20	0.01	0.03	0.04	0
11 Coal	$4,705,019.65	0	0	0	0	6,971.82	0	0	0.01	0
13 Crude Petrol. or Natural Gas	$106,998.88	0	0	0	0	418.32	0	0	0	0
14 Nonmetallic Minerals	$410,735,705.90	0.35	0.21	0.23	0.64	14,210,603.94	21.92	17.51	8.04	35.8
19 Ordnance or Accessories	$555,698,334.30	0.09	0.23	0.41	0.1	17,273.04	0	0.01	0.03	0
20 Food or Kindred Products	$28,423,943,295.00	7.87	14.61	20.22	5.32	17,100,814.62	7.89	13.66	28.17	2.49
21 Tobacco Products	$183,131,490.80	0.1	0.58	0	0.02	7,864.80	0.01	0.04	0	0
22 Textile Mill Products	$718,955,685.50	0.61	0.93	0.34	0.23	118,816.79	0.11	0.29	0.11	0.02
23 Apparel or Related Products	$4,526,156,491.00	0.49	2.19	3.34	0.3	435,323.82	0.08	0.4	0.73	0.03
24 Lumber or Wood Products	$2,772,615,164.00	0.8	2.4	1.73	0.37	2,367,995.45	0.55	3.48	3.45	0.09
25 Furniture or Fixtures	$2,890,815,717.00	2.25	1.95	1.83	0.77	687,558.47	0.31	0.79	1.05	0.08
26 Pulp,paper or Allied Products	$3,557,658,401.00	2.6	2.61	2.22	0.88	1,818,328.22	1.3	2.18	2.68	0.2
27 Printed Matter	$1,892,841,091.00	1.36	0.87	1.3	0.57	674,027.89	0.55	0.45	1.11	0.12
28 Chemicals or Allied Products	$9,303,500,061.00	4.62	8.59	5.46	2.54	3,112,374.65	1.31	4.08	4.58	0.34
29 Petroleum or Coal Products	$3,775,725,297.00	6.36	1.01	0.38	28.73	6,992,412.14	9.99	8.31	3.18	20.61
30 Rubber or Misc Plastics	$7,426,125,917.00	9.65	4.46	4.56	2.56	1,782,911.48	2.82	1.68	2.56	0.35
31 Leather or Leather Products	$3,695,893,013.00	0	1.55	2.83	0	206,287.32	0	0.13	0.37	0
32 Clay,concrete,glass or Stone	$2,301,948,354.00	3.14	1.17	1.1	5.36	8,655,717.14	12.77	6.27	6.34	22.69
33 Primary Metal Products	$5,074,863,497.00	2.83	2.01	3.74	0.16	1,676,964.65	0.62	1.17	2.92	0.03
34 Fabricated Metal Products	$7,571,635,907.00	2.66	4.93	5.1	1.29	1,795,602.81	0.78	1.9	2.81	0.2
35 Machinery	$11,479,203,086.00	3.46	4.84	8.57	0.22	1,052,766.48	0.38	0.76	1.82	0.02
36 Electrical Equipment	$9,577,330,444.00	3.31	5.97	6.61	0.46	874,913.85	0.41	1.04	1.34	0.03

37 Transportation Equipment	$19,362,910,504.00	2.2	7.84	14.34	5.68	1,791,620.67	0.22	1.32	3.06	0.3
38 Instrum, Photo Equipment, Optical Eq	$4,033,849,016.00	1.99	2.7	2.7	0.18	177,903.88	0.08	0.19	0.28	0
39 Misc Manufacturing Products	$5,646,966,141.00	11.97	2.71	3.08	5.48	705,649.16	1.91	0.49	0.85	0.53
40 Waste or Scrap Materials	$2,788,905,199.00	6.4	1.21	1.27	5.88	7,567,336.29	25.54	6.65	6.06	11.55
41 Misc Freight Shipments	$266,356,064.50	0.02	0.01	0.23	0	15,391.82	0	0	0.03	0
42 Shipping Containers	$0.00	0	0	0	0	-	0	0	0	0
43 Mail or Contract Traffic	$31,646,817.32	0.17	0.07	0	0	9,204.15	0.06	0.03	0	0
46 Misc Mixed Shipments	$501,047,821.20	0.14	0.25	0.37	0	71,575.97	0.02	0.06	0.12	0
47 Small Packaged Freight Shipments	$0.00	0	0	0	0	42,567.43	0.37	0.11	0	0
50 Secondary Traffic	$12,958,717,580.00	24.31	18.95	2.46	32.24	7,055,272.30	9.4	20.75	3.98	4.52

Table 5 reports the total value and total tons of each commodity for each direction of travel (Outbound, Inbound, Through, Intra), and the corresponding percentages represent the proportion of that specific commodity's contribution to the total freight activity in that direction.

Table 5. 2050 Clark County, NV Freight Flows by Commodity

Commodity	Total Value	%OB	%IB	%Thr	%Intr	Total Tons	%OB	%IB	%Thr	%Intr
01 Farm Products	$11,001,037,125.00	0.09	3.67	4.53	0.01	12,356,751.99	0.58	6.06	14.28	0.01
08 Forest Products	$23,584,343.96	0	0.01	0.01	0	9,136.77	0	0.01	0.01	0
09 Fresh Fish or Marine Products	$953,609,462.20	0	0.5	0.35	0	86,473.19	0	0.07	0.09	0
10 Metallic Ores	$400,179,992.70	0.07	0.14	0.16	0	35,590.05	0.01	0.02	0.04	0
11 Coal	$2,485,245.80	0	0	0	0	4,987.02	0	0	0.01	0
13 Crude Petrol. or Natural Gas	$164,699.11	0	0	0	0	643.83	0	0	0	0
14 Nonmetallic Minerals	$538,695,671.60	0.19	0.15	0.19	0.48	15,010,450.18	10.25	14.33	6.3	30.47
19 Ordnance or Accessories	$797,921,459.90	0.08	0.17	0.35	0.07	25,342.60	0	0.01	0.03	0
20 Food or Kindred Products	$47,985,572,193.00	9.35	12.51	19.72	6.49	26,427,903.63	10.34	13.76	28.57	2.98
21 Tobacco Products	$38,584,539.95	0.09	0.05	0	0.02	2,364.76	0.01	0	0	0
22 Textile Mill Products	$775,606,000.00	0.4	0.62	0.2	0.15	131,852.48	0.1	0.23	0.08	0.02
23 Apparel or Related Products	$7,470,829,947.00	0.29	1.91	3.2	0.17	761,970.21	0.06	0.41	0.86	0.02
24 Lumber or Wood Products	$3,709,979,785.00	0.65	1.68	1.37	0.33	2,729,107.70	0.69	2.49	2.66	0.12
25 Furniture or Fixtures	$4,957,228,086.00	3.12	2.42	1.63	0.9	1,205,705.06	0.5	1.19	1.11	0.1
26 Pulp,paper or Allied Products	$4,157,082,321.00	4.15	1.96	1.27	1.15	2,144,505.89	2.74	2.07	1.77	0.3
27 Printed Matter	$1,426,541,178.00	0.48	0.42	0.56	0.22	484,775.01	0.23	0.24	0.53	0.05
28 Chemicals or Allied Products	$17,187,445,787.00	5.35	9.85	5.57	3.84	5,992,161.80	1.63	6.42	5.43	0.48
29 Petroleum or Coal Products	$2,900,863,451.00	3.19	0.63	0.15	16.09	5,597,929.80	6.74	5.56	1.56	13.04

30 Rubber or Misc Plastics	$13,210,950,750.00	18.22	4.65	4.02	5.25	3,244,977.19	7.26	2.08	2.63	0.82
31 Leather or Leather Products	$3,352,976,603.00	0	1.12	1.38	0.01	216,138.54	0	0.12	0.25	0
32 Clay,concrete,glass or Stone	$3,562,241,276.00	2.2	1.28	0.98	5.79	12,847,076.09	11.85	7.09	6.45	27.91
33 Primary Metal Products	$8,378,891,601.00	0.73	1.75	3.66	0.08	2,800,808.05	0.4	1.08	3.31	0.02
34 Fabricated Metal Products	$12,095,782,004.00	2.12	4.35	4.71	1.39	2,860,114.52	0.91	2.05	2.93	0.26
35 Machinery	$28,236,497,152.00	2.9	6.24	12.23	0.39	2,844,231.49	0.46	1.38	3.25	0.03
36 Electrical Equipment	$25,475,088,221.00	10.18	9.26	9.66	1.31	2,376,340.90	1.64	2.11	2.23	0.09
37 Transportation Equipment	$30,663,704,350.00	2.04	7.89	12.73	6.37	2,877,083.33	0.27	1.58	3.16	0.38
38 Instrum, Photo Equipment, Optical Eq	$10,417,484,890.00	1.97	3.98	4.03	0.49	492,095.29	0.1	0.34	0.52	0.01
39 Misc Manufacturing Products	$9,435,338,404.00	4.78	3.92	3.04	6.67	1,160,131.30	0.97	0.8	0.99	0.7
40 Waste or Scrap Materials	$4,639,230,840.00	5.38	0.87	1.37	6.77	11,417,802.41	28.38	5.52	6.61	14.96
41 Misc Freight Shipments	$547,546,431.90	0.04	0.01	0.27	0	30,891.42	0	0	0.04	0
42 Shipping Containers	$0.00	0	0	0	0	-	0	0	0	0
43 Mail or Contract Traffic	$31,011,388.18	0.15	0.03	0	0	9,019.34	0.07	0.01	0	0
46 Misc Mixed Shipments	$976,713,126.80	0.1	0.19	0.43	0	135,628.31	0.02	0.05	0.16	0
47 Small Packaged Freight Shipments	$0.00	0	0	0	0	63,203.96	0.29	0.15	0	0
50 Secondary Traffic	$19,975,046,061.00	21.7	17.77	2.23	35.56	11,543,270.20	13.49	22.73	4.16	7.24

Value related summary

Analyzing the top 5 commodity freight flow series for Clark County, NV, in terms of value for the years 2015, 2019, 2021, and the projected year 2050:

2015 Commodity Freight Flow by Value

The top commodity in terms of value was STCC No. 20 Food or Kindred Products with a total value of $28.07 billion. This commodity accounted for 7.52 percent outbound (OB), 14.83 percent inbound (IB), 18.88 percent through (Thr), and 5.41 percent intra (Intr) flows. Food And Kindred Products encompasses establishments primarily manufacturing or processing foods and beverages for human consumption. [2]

The second largest contributor, STCC No. 37 Transportation Equipment, brought in $24.14 billion with contributions of 1.35 percent OB, 8.72 percent IB, 17.49 percent Thr, and 3.81 percent Intr flows. Transportation equipment pertains to the manufacturing sector focused on creating equipment for

[2] https://www.osha.gov/data/sic-manual/major-group-20#:~:text=This percent20major percent20group percent20includes percent20establishments,feeds percent20for percent20animals percent20and percent20fowls.

transporting passengers and cargo across land, air, and water. This encompasses various products, including motor vehicles, aircraft, ships, boats, guided missiles, space vehicles, and related components. [3]

STCC No. 50 Secondary Traffic – drayage shipments stood at $13.77 billion, dominated by a large Intr flow of 32.66 percent. This is a "Non-standard code specific to Transearch and on truck movements: STCC No. 50 10 for secondary traffic (distribution centers or warehouses to consuming points like retail stores), STCC No. 50 21 and 50 22 for rail intermodal dray, and STCC No. 50 31 and STCC No. 50 32 for air freight dray. [4]" Drayage is a term used in the logistics and freight industry to describe the transport of goods over short distances, particularly within the same metropolitan area. This can be part of the journey between different transportation hubs, such as seaports, rail terminals, distribution centers, warehouses, and retail stores.

Commented [SM12]: Do you need to define dray and drayage?

STCC No. 35 Machinery contributed to $12.44 billion of value, 3.39 percent IB, 3.66 percent OB, 9.19 percent Thr, and almost a negligible amount of 0.16 percent Intra flows. Machinery encompasses establishments involved in manufacturing a broad range of machinery, equipment, and computers essential for various industrial and commercial operations. This category is deeply involved with the production of engines, turbines, farm machinery, construction tools, mining devices, metalworking equipment, computers, and office machinery.[5] Note that the majority was passing through instead of in or out bound.

Lastly, STCC No. 28 Chemicals or Allied Products rounded out the top 5, with a total value of $10.50 billion, with 6.08 percent accounting for IB, 8.57 percent OB, 6.14 percent passing Thr, and 2.95 percent Intr traffic flows. Chemicals And Allied Products represents establishments producing basic chemicals, intermediate products, and finished goods. This diverse category includes everything from foundational chemicals like acids, salts, and organic compounds to specialized products such as pharmaceuticals, cosmetics, soaps, and fertilizers. The reach of this sector is vast, providing essential materials for various industries like paints, explosives, and synthetic fibers.[6] Note that the majority of its value was outbound.

2019 Commodity Freight Flow by Value

The STCC No. 20 Food or Kindred Products again was on top this year with a total value of $27.76 billion, contributing 7.62 percent OB, 14.84 percent IB, 19.83 percent Thr, and 5.08 percent Intr. 37 flows. Transportation Equipment had a value of $21.91 billion, with STCC No. 50 Secondary Traffic at $13.07 billion, showing a significant Intr percentage of 32.76 percent. 35 Machinery and 28 Chemicals or Allied Products made the list again with values of $11.35 billion and $9.24 billion, respectively.

2021 Commodity Freight Flow by Value

[3] https://www.osha.gov/data/sic-manual/major-group-37
[4] Transearch 2020 Tutorial.pdf
[5] https://www.osha.gov/data/sic-manual/major-group-35
[6] https://www.osha.gov/data/sic-manual/major-group-28

The STCC No. 20 Food or Kindred Products led with $28.42 billion, followed by 37 Transportation Equipment with a value of $19.36 billion. STCC No. 50 Secondary Traffic stood at $12.95 billion, having a dominant Intr value of 32.24 percent. STCC No. 35 Machinery with $11.48 billion and STCC No. 36 Electrical Equipment with $9.57 billion completed the top 5 commodities for this year. Electrical Equipment includes establishments in the manufacturing of machinery, apparatus, and supplies used in various stages of electrical energy - from generation to utilization. The products of these establishments range from electricity distribution equipment, electrical devices for industrial and household purposes, lighting, and wiring equipment, to electronic components, radio and television equipment, and communication tools. [7]

2050 Commodity Freight Flow by Value

(Projected): The projections for 2050 suggest a dominant position for STCC No. 20 Food or Kindred Products with a whopping $47.98 billion. STCC No. 37 Transportation Equipment and STCC No. 35 Machinery are projected at $30.66 billion and $28.23 billion, respectively. 36 Electrical Equipment will be at $25.47 billion, while STCC No. 50 Secondary Traffic is expected to surge to $19.97 billion with a very high Intr percentage of 35.56 percent. As a reminder, secondary traffic is a nonstandard code used by Transearch to explain movements offloaded from a train or airplane and then onto a vehicle that will transport the goods to the end destination. This data are broken down into STCC No. STCC 50 21 to the rail yard and STCC No. 50 22 from the rail yard for rail intermodal drayage, STCC No. 50 31 to the airport, and STCC No. 50 32 for air freight drayage.

Tonnage related summary

Analyzing the top 5 commodity freight flow data for Clark County, NV, in terms of tons for the years 2015, 2019, 2021, and the projected year 2050:

2015:

Again, 20 Food or Kindred Products came ahead at 17,180,525.82 tons, split as 6.63 percent OB, 14.22 percent IB, 27.36 percent Thr, and 2.44 percent Intr flows.

14 Nonmetallic Minerals weighed in at 16,969,000.31 tons, apportioned with 34.12 percent OB, 17.73 percent IB, 10.24 percent Thr, and 40.62 percent Intr flows. Nonmetallic Minerals encompass establishments mainly mining, quarrying, developing mines, or exploring nonmetallic minerals, barring

Commented [SM13]: No pun intended?

[7] https://www.osha.gov/data/sic-manual/major-group-36

fuels. This group also comprises specific operations linked to wells and brines and primary preparation plants that engage in activities like crushing, grinding, washing, or concentrating .

32 Clay, concrete, glass, or Stone contributes 8,187,315.89 tons with 8.69 percent OB, 7.45 percent IB, 5.4 percent Thr, and 22.35 percent Intr flows. Clay, concrete, glass, or stone pertains to establishments that produce items from stone, clay, glass, and concrete. They specifically manufacture products such as flat glass, cement, pottery, concrete, gypsum items, cut stone, abrasive, and asbestos products, among others. These products are mainly derived from natural resources like stone, clay, and sand.

50 Secondary Traffic summarized to 7,463,501.14 tons with 6.51 percent OB, 23.92 percent IB, 4.75 percent Thr, and 2.72 percent Intr flows. Finally, 40 Waste or Scrap Materials at 7,121,455.25 tons contributed 24.01 percent OB, 6.67 percent IB, 5.54 percent Thr, and 10.26 percent Intr. flows

2019: First, 20 Food or Kindred Products with 16,964,334.85 tons, demonstrating 7.39 percent OB, 13.47 percent IB, 28.05 percent Thr, and 2.37 percent Intr flows. 14 Nonmetallic Minerals comes second with 15,275,740.32 tons, distributed as 22.27 percent OB, 19.13 percent IB, 8.96 percent Thr, and 37.01 percent Intr flows. The 32 Clay, concrete, glass or Stone holds 8,384,671.21 tons with a spread of 11.45 percent OB, 6.37 percent IB, 6.16 percent Thr, and 21.6 percent Intr flows. 01 Farm Products is at 7,647,703.20 tons with 0.48 percent OB, 5.86 percent IB, 13.43 percent Thr, and 0.01 percent Intr flows. Lastly, 40 Waste or Scrap Materials represent 7,552,150.99 tons, having 27.29 percent OB, 6.35 percent IB, 5.92 percent Thr, and 11.49 percent Intr flows.

2021:

The 20 Food or Kindred Products retains its top spot with 17,100,814.62 tons, showcasing 7.89 percent OB, 13.66 percent IB, 28.17 percent Thr, and 2.49 percent Intr flows. 14 Nonmetallic Minerals sits at 14,210,603.94 tons, distributed with 21.92 percent OB, 17.51 percent IB, 8.04 percent Thr, and 35.8 percent Intr flows. The 32 Clay, concrete, glass, or Stone records 8,655,717.14 tons showing 12.77 percent OB, 6.27 percent IB, 6.34 percent Thr, and 22.69 percent Intr flows. 01 Farm Products brings in 8,070,614.40 tons with 0.58 percent OB, 6.11 percent IB, 14.2 percent Thr, and 0.01 percent Intr flows. Finally, the 40 Waste or Scrap Materials present 7,567,336.29 tons with a display of 25.54 percent OB, 6.65 percent IB, 6.06 percent Thr, and 11.55 percent Intr flows.

2050

(Projected): The top commodity by tons remains 20 Food or Kindred Products, with 26,427,903.63 tons projected for 2050. This commodity is attributed to 10.34 percent OB, 13.76 percent IB, 28.57 percent Thr, and 2.98 percent Intr traffic flows. Following this is the 14 Nonmetallic Minerals, with 15,010,450.18 tons contributing to 10.25 percent OB, 14.33 percent IB, 6.3 percent Thr, and 30.47 percent Intr flows. 32

Clay, concrete, glass, or Stone has 12,847,076.09 tons with 11.85 percent OB, 7.09 percent IB, 6.45 percent Thr, and 27.91 percent Intr flows. 01 Farm Products is projected at 12,356,751.99 tons with 0.58 percent OB, 6.06 percent IB, 14.28 percent Thr, and 0.01 percent Intr flows. Finally, 50 Secondary Traffic has 11,543,270.20 tons having 13.49 percent OB, 22.73 percent IB, 4.16 percent Thr, and 7.24 percent Intr flows.

Figure 10: Time-Series Line Chart: Top 10 commodities each year by STCC 4 digit by value for 2015, 2019, 2021, and the projected year 2050. The percentages labeled are the proportion of the total value the commodity was responsible for in freight movements by all modes of travel that year. (*12 commodities graphed, due to slight variation of trade across years)

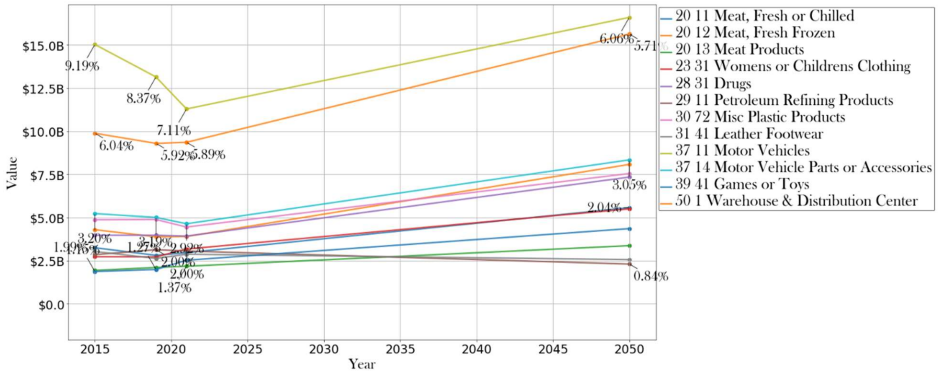


Table 5: Top 10 4-digit STCC Commodities proportion of total value by year.

Commodity	Year			
	2015	2019	2021	2050
20 11 Meat, Fresh or Chilled	1.99	1.79	1.87	2.04
20 12 Meat, Fresh Frozen	2.63	2.47	2.46	2.95
20 13 Meat Products	1.19	1.34	1.37	1.23
23 31 Womens or Childrens Clothing	1.67	1.73	2.00	2.01
28 31 Drugs	2.43	2.53	2.47	2.68
29 11 Petroleum Refining Products	1.74	2.00	1.93	0.84
30 72 Misc Plastic Products	2.98	3.11	2.80	2.76
31 41 Leather Footwear	1.86	1.68	1.81	0.94
37 11 Motor Vehicles	9.19	8.37	7.11	6.06
37 14 Motor Vehicle Parts or Accessories	3.20	3.19	2.92	3.05
39 41 Games or Toys	1.15	1.27	1.59	1.59
50 1 Warehouse & Distribution Center	6.04	5.92	5.89	5.71

* Proportion of total values are shown in percentages

In summary, for the years 2015, 2019 and 2021, the top 10 commodities remained unchanged by value. The projected year 2050 showed variation with the addition of '20 13 Meat Products' and '39 41 Games or Toys'. As of 2021, Meat Products surpass both '29 11 Petroleum Refining Products' and '31 41 Leather Footwear', by total value. However, by percentage of trade, '20 13 Meat Products' is expected to decline from 1.37 percent as of 2021 to 1.23 percent by 2050. STCC '39 41 Games or Toys' is equivalent to NAICS code 339932, Game, Toy, and Children's Vehicle Manufacturing: This U.S. industry focuses on the manufacturing of games, toys, and children's vehicles, except for bicycles and metal tricycles. Representative products under NAICS 339932 are children's automobiles, rubber balls, electronic toys and games, kites, toy rifles, children's scooters, and adult games like chess and checkers and craft hobby kits.

Figure 11: Time Series Line Chart: Top 10 commodities by STCC 4 digit filtered by Tons for 2015, 2019, 2021 and the projected year 2050. The percentages labeled are the proportion of total tons the commodity was responsible for in freight movements by all modes of travel that year. (*12 commodities graphed, due to slight variation of trade across years)

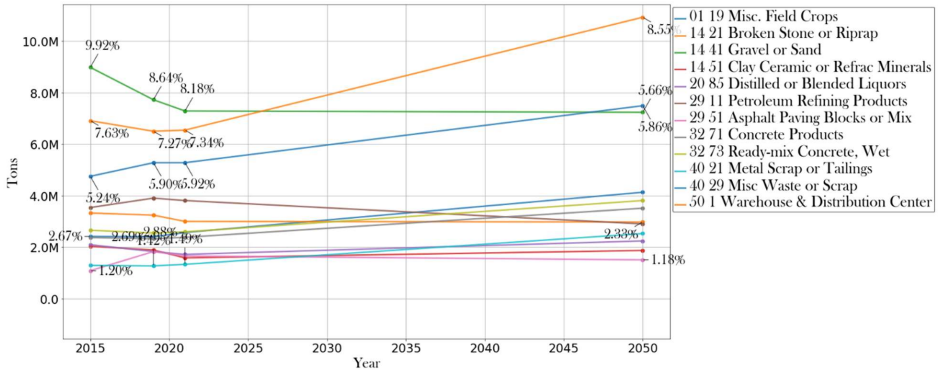


Table 6: Top 10 4-digit STCC Commodities proportion of total tons by year.

Commodity	Year			
	2015	2019	2021	2050
01 19 Misc. Field Crops	2.67	2.69	2.88	3.23
14 21 Broken Stone or Riprap	3.67	3.63	3.36	2.33
14 41 Gravel or Sand	9.92	8.64	8.18	5.66
14 51 Clay Ceramic or Refrac Minerals	2.24	2.11	1.78	1.46
20 85 Distilled or Blended Liquors	2.31	2.04	1.93	1.75
29 11 Petroleum Refining Products	3.90	4.37	4.27	2.27
29 51 Asphalt Paving Blocks or Mix	1.20	2.04	1.86	1.18
32 71 Concrete Products	2.62	2.60	2.67	2.75
32 73 Ready-mix Concrete, Wet	2.93	2.85	2.91	2.98
40 21 Metal Scrap or Tailings	1.42	1.42	1.49	1.98
40 29 Misc Waste or Scrap	5.24	5.90	5.92	5.86
50 1 Warehouse & Distribution Center	7.63	7.27	7.34	8.55

*Proportion of total tons are shown in percentages

Commodities varied more by tons than values based on top 10 by year. The top 3 remain relatively the same, except for the projected year 2050, where '40 29 Misc Waste or Scrap' is projected to overtake '14 41 Gravel or Sand', which is expected to decline from 8.17 percent in 2021 to 5.66 percent of total tonnage of freight moved in 2050. Additionally, '50 1 Warehouse & Distribution Center' is expected to surpass all commodities by tons and proportion of freight moved that year by weight at 8.55 percent, up from 7.34 percent in 2021. That is, staging and storing of commodities may become more important in the future, as suppliers maximize efficiency of shipping and moving materials to destined locations.

Top Trade Partner Flows

ArcGIS WebApp of the Aggregated Transearch IHS Data State and Province Level US, MX, CA

Map Link: https://arcg.is/0LemK1

The interactive map accessible via the link provided serves as a visual representation of the Transearch freight flow data for Clark County, NV. The map contains several layers, each providing a different

perspective of the freight flow data collected in 2015, 2019, and 2021. It's recommended to select only one of these years using the time slider to avoid overlapping data.

Below are the key layers available on the map and how to interpret them:

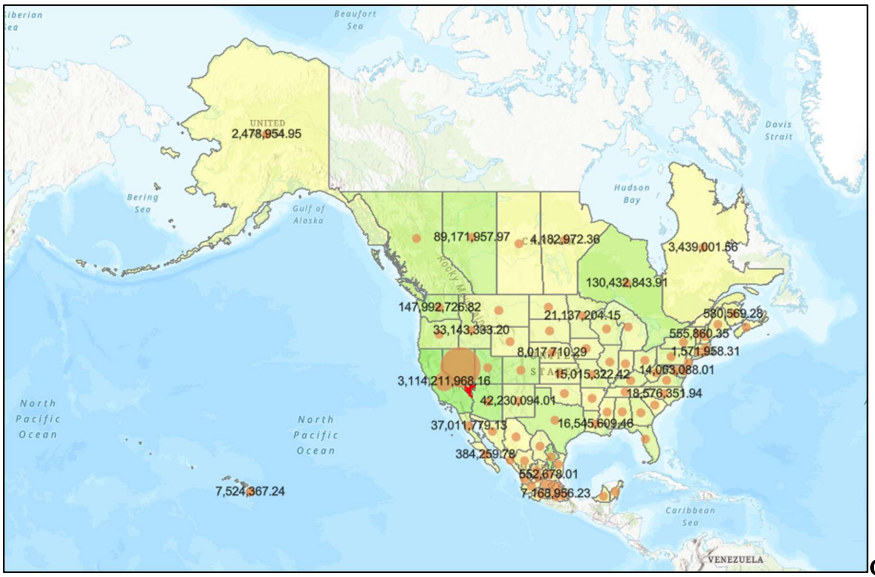
Route Collection Area Clark County, NV Routes: This layer delineates the geographic scope within which the data was collected. It sets the spatial context for understanding freight flows. (See Figure 1.)

Clark County, NV: This layer presents the polygon shape of Clark County, NV, providing a clear visual of the area of interest. (See Figure 1.)

The following summary layers provide aggregated freight flow data. These are color-coded, with a gradient from **green** (high values or tons) to **yellow** (low values or tons). Each layer provides a summary of all transportation modes and commodities, giving an overall picture of freight flow values. Please note that the legends are not included in the time-series view, but the color gradient and proportional circle symbols can help identify areas of interest.

Clark County, NV Origin Summary: This layer illustrates the destinations of all commodities originating from Clark County, NV. For example, in 2015, commodities worth $3,114,211,968.16 were shipped from Clark County, NV to California. The value referenced to the state will be the total that came from Clark County, NV for that year, and will change with the time slider. In attempts to give more context to the maps, proportion of trade circles and color gradients are based on total values and tons.

Figure ##: Example of ArcGIS data for Clark County, NV Origin Summary with year slider adjusted for 2015 data.



Clark County, NV Destination Summary: This layer shows the origin states of all trade flowing into Clark County, NV. For instance, California sent commodities worth approximately $10 billion to Clark County, NV in 2015.

Destination Nevada Excluded and Total Destination Summary: These layers show the destinations of all commodities passing through the Route Collection Area Clark County, NV Routes. The only difference between these two layers is that the Destination Nevada Excluded layer does not include Nevada as a destination.

Origin Nevada Excluded: This layer depicts the origin states of all commodities passing through the Route Collection Area, excluding Nevada as a destination. This can help visualize the value of commodities leaving or passing through Nevada without ending up in Nevada.

Origin Total Summary: This layer shows the total values for the state origins for all commodities and all destinations. This can be used in conjunction with other layers to deduce specific trends or patterns.

By leveraging these layers effectively, users can dissect complex freight flow dynamics and gain valuable insights into how commodities move across different states as well as cross border activity.