TRANSPORTATION, DISTRIBUTION, AND LOGISTICS CLUSTER



Department of Economic & Community Development Center for Economic Research in Tennessee (CERT)

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Introduction

Transportation, distribution, and logistics is one of Tennessee's largest traded clusters. Tennessee's employment concentration in this cluster ranks first among all U.S. states.¹ Employing 218,839 workers at 13,397 establishments across the state, logistics companies provide services that ensure efficiency and reliability across the entire supply chain. Tennessee is home to the headquarters of FedEx, a global leader in courier and express delivery services. Tennessee has strong employment and major establishments in freight trucking and other transportation industries as well. Proximity to major ports, including the Port of Memphis, makes Tennessee an advantageous place to base a logistics operation. This cluster also includes wholesalers of durable and nondurable goods, trade agents and brokers, electronic markets, warehousing and storage, and other support services, like packing and crating.

The 63 industries in this cluster have experienced surging demand in recent years, primarily due to the growth of e-commerce. Tennessee's employment in this cluster increased by 18,250 jobs since 2013 (a 9% increase). Continued economic recovery and increased manufacturing output in the U.S. will create new revenue opportunities for Tennessee companies. Success of this cluster is closely linked to growth of other clusters, such as business services. Process, physical distribution, and logistics consulting services, one of Tennessee's strongest business services industries, grew significantly since 2013. Employment increased from 1,826 jobs to 7,504 today (a 311% increase).



In 2017, Tennessee companies in this cluster earned a total of \$16.6 billion. The bulk of these earnings came from wholesale trade, which also contributed the largest share to overall cluster employment. Tennessee also has substantial employment in transportation and warehousing, particularly truck transportation. Tennessee ranks third in the nation for trucking employment.² For specialized freight trucking, Tennessee's employment is higher than every state besides Texas.

NAICS	Description	2018 Employment	2017 Business Locations	2017 Industry Earnings		
Wholes	Wholesale Trade					
423	Merchant Wholesalers, Durable Goods	39,906	3,887	\$3,558,747,655		
424	Merchant Wholesalers, Nondurable Goods	28,488	2,019	\$2,428,158,150		
425	Wholesale Electronic Markets and Agents and Brokers	16,406	4,501	\$1,875,140,007		
Retail T	Retail Trade					
454	Nonstore Retailers	7,262	470	\$436,163,302		

¹ Industry and occupational data were obtained from Economic Modeling Specialists (2018.3 datarun).

² Institute for Strategy and Competitiveness, Harvard Business School. *Tennessee: Transportation and Logistics*. http://clustermapping.us/region-cluster/transportation and logistics/state/tennessee/subclusters

Transportation, Distribution, and Logistics Cluster

NAICS	Description	2018 Employment	2017 Business Locations	2017 Industry Earnings
Transp	ortation and Warehousing			
484	Truck Transportation	38,977	1,413	\$2,653,952,511
488	Support Activities for Transportation	8,261	408	\$597,842,149
492	Couriers and Messengers	39,356	239	\$3,257,904,350
493	Warehousing and Storage	38,867	408	\$1,748,354,627
Administrative and Support and Waste Management and Remediation Service				
561	Administrative and Support Services	1,317	52	\$59,997,101

Workforce

Average wages in this cluster are \$72,521, with \$62,124 in wages and an additional \$10,397 in supplements and benefits. These wages are more than \$15,000 above the salary of the average Tennessean and are comparable to the regional and national averages for wages in this cluster.³ In certain industries, Tennessee has some of the highest wages in the nation. Tennessee ranks first in the nation for average wages in sporting and recreational goods wholesaling and second in the nation for farm product raw materials wholesaling.

SOC	Occupation	2018 Jobs	Median Hourly Earnings			
Manager	Management Occupations					
11-1021	General and Operations Managers	43,784	\$41.19			
11-2022	Sales Managers	7,973	\$44.04			
11-3071	Transportation, Storage, and Distribution Managers	4,306	\$37.05			
Sales and	Related Occupations					
41-1012	First-Line Supervisors of Non-Retail Sales Workers	9,215	\$26.56			
41-2031	Retail Salespersons	93,099	\$10.83			
41-3099	Sales Representatives, Services, All Other	19,482	\$21.68			
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific	9,545	\$32.43			
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific	21,993	\$24.04			
Office an	d Administrative Support Occupations					
43-1011	First-Line Supervisors of Office and Administrative Support Workers	38,166	\$24.47			
43-3031	Bookkeeping, Accounting, and Auditing Clerks	33,523	\$18.05			
43-4051	Customer Service Representatives	64,283	\$14.83			
43-4151	Order Clerks	5,680	\$15.17			
43-5032	Dispatchers, Except Police, Fire, and Ambulance	5,438	\$18.21			
43-5071	Shipping, Receiving, and Traffic Clerks	18,408	\$14.45			
43-5081	Stock Clerks and Order Fillers	57,147	\$11.57			
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	63,405	\$15.51			
43-9061	Office Clerks, General	64,007	\$14.58			
Installati	on, Maintenance, and Repair Occupations					
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	7,726	\$20.44			
49-9071	Maintenance and Repair Workers, General	33,657	\$17.46			

³ The Southeast region includes 12 states: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.

soc	Occupation	2018 Jobs	Median Hourly Earnings
Transpor	tation and Material Moving Occupations		
53-1048	First-line Supervisors of Transportation Workers, Except Aircraft Cargo Handling	12,862	\$23.75
53-3032	Heavy and Tractor-Trailer Truck Drivers	66,407	\$18.83
53-3033	Light Truck or Delivery Services Drivers	20,162	\$15.19
53-7051	Industrial Truck and Tractor Operators	18,825	\$15.05
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	92,540	\$13.07
53-7064	Packers and Packagers, Hand	19,106	\$10.61

Logistics-related occupations have been growing in Tennessee. Between 2013 and 2018, these occupations increased from 2.6 million to 2.9 million in Tennessee. This five-year increase of 10.8% exceeded the growth rate of these occupations at the national level (8.6%).

Workforce Readiness

Technological advancements have had major, irreversible impacts on the logistics workforce. Today's logistics companies require workers with technological expertise and other advanced skill sets. The continued success of the logistics cluster in Tennessee will depend on adapting to these new challenges as well as increasing STEM completions at postsecondary institutions in the state.

> Changing occupations

The rise of automation and digital connectivity is changing the types of occupations that logistics companies require.⁴ Robots have begun to replace pallet drivers within warehouses and may eventually replace long-distance drivers. Logistics operations will eventually require more workers with the ability to create or manage automated processes than material movers. Many occupations will also undergo consolidation as "smart factories" continue to develop. For example, logistics coordinators and billing specialists may eventually merge into the same position.

> New skill sets

Even traditional logistics occupations will require new skills. Sensing systems, like smart glasses and other wearable devices, will be used in warehousing operations and for tracking fleet. Cognitive technologies that automate decisions previously made by humans, like when to reorder parts or creating distribution routes, will be a key component of warehouse management.⁵

> Talent pipeline

To avoid labor shortages, logistics companies will require a strong talent pipeline. Many logistics companies are worried about meeting this challenge. A recent survey showed that only onequarter of logistics executives felt confident that they retained a workforce capable of adapting to the future of the industry.⁶

Tennessee has cultivated a strong educational pipeline for occupations in the logistics cluster. In 2017, post-secondary institutions in Tennessee produced 64,254 graduates from 548

⁴ Burke, A., Mussomeli, A., Laaper, S., Hartigan, M., & Sniderman, B. (2017). *The smart factory.*

⁵ Taliaferro, A., Rozierre, L., Ahmed, U., Dayal, A., & Lee, J. (Jul. 2018). *Delivering digital talent*.

⁶ Deloitte Insights. (2017). *The Fourth Industrial Revolution is here – are you ready?*

programs of study related to careers in the logistics industry. Part of the problem is that Tennessee and other states are competing with Silicon Valley for high-tech workers. To attract requisite talent, logistics companies will have to think outside the box and recruit workers from careers like operational researchers and mathematicians. Increasing STEM graduations in Tennessee will be an essential component to ensuring the long-term vitality of this cluster.

Another way to bolster the talent pipeline in Tennessee would be to expand apprenticeship programs for key occupations related to logistics industries. A recent study, co-authored by TNECD and the Southeast Transportation Workforce Center at the University of Memphis, demonstrated that apprenticeship programs in three specific areas (diesel technicians, CDL drivers, and engineering/STEM) would greatly improve the transportation labor force in Shelby County. Apprenticeship programs for students are an effective way to address workforce challenges, like an aging workforce and labor shortages.⁷

Wholesale Trade

Merchant Wholesalers, Durable Goods (NAICS 423)

Tennessee currently has 5,826 durable goods wholesalers, employing a total of 65,780 workers. The category of durable goods encompasses 23 types of products, ranging from metals and construction materials to sporting goods and toys. Tennessee's industry is comparable to the average U.S. state, as demonstrated by the 2018 location quotient (1.08). Wholesalers in Tennessee are comparable in size and total number to those in most states. Tennessee currently ranks fourth in the region for both employment and employment concentration for the durable goods wholesaling industry.

NAICS	Durable Goods Category	2018 Employment	Five-Year Growth Rate (2013-2018)	Business Locations	Average Earnings
Furniture	e and Home Furnishing				
423210	Furniture	828	18.6%	89	\$72,634
423220	Home Furnishing	1,441	61.5%	98	\$67,804
Professio	nal and Commercial Equipment and Supplies				
423410	Photographic Equipment and Supplies	55	(16.7%)	28	\$84,597
423420	Office Equipment	1,876	(2.4%)	130	\$72,872
423430	Computer Equipment and Software	2,106	(9.3%)	301	\$123,431
423440	Other Commercial Equipment	1,582	(0.9%)	150	\$67,485
423450	Medical, Dental, and Hospital Equipment and Supplies	6,089	(17.5%)	581	\$105,671
423460	Ophthalmic Goods	218	(0.5%)	39	\$83,904
423490	Other Professional Equipment and Supplies	565	17.5%	67	\$100,376
Metal an	d Mineral (except Petroleum)				
423510	Metal Service Centers and Other Metal	2,633	1.6%	168	\$79,633
423520	Coal and Other Mineral and Ore	17	(50.0%)	9	\$107,150
Househo	ld Appliances and Electrical and Electronic Goods				
423610	Electrical Apparatus and Equipment, Wiring Supplies	4,191	12.4%	326	\$83,347

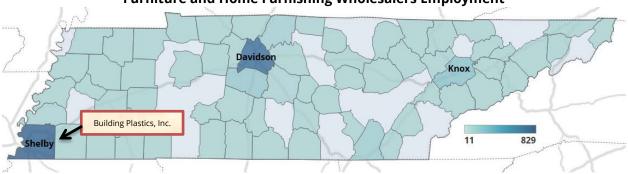
⁷ Southeast Transportation Workforce Center. (May 2018). *Transportation, Distribution, and Logistics: Apprenticeship Acceleration in West Tennessee*.

NAICS	Durable Goods Category	2018 Employment	Five-Year Growth Rate (2013-2018)	Business Locations	Average Earnings
423620	Household Appliances, Housewares, and Electronics	769	10.8%	80	\$83,831
423690	Other Electronic Parts and Equipment	1,291	(2.4%)	169	\$88,724
Machine	ry, Equipment, and Supplies				
423810	Construction and Mining Machinery and Equipment	2,118	6.6%	126	\$87,397
423820	Farm and Garden Machinery and Equipment	1,792	5.8%	191	\$63,648
423830	Industrial Machinery and Equipment	6,270	6.9%	612	\$81,247
423840	Industrial Supplies	2,749	8.1%	307	\$71,531
423850	Service Establishment Equipment and Supplies	1,252	(11.1%)	152	\$60,026
423860	Transportation Equipment (except Motor Vehicle)	319	(11.9%)	51	\$96,807
Miscellar	neous Durable Goods				
423910	Sporting and Recreational Goods and Supplies	1,086	31.0%	126	\$92,296
423920	Toy and Hobby Goods and Supplies	401	(2.4%)	27	\$49,734
423940	Jewelry, Watch, Precious Stone, and Precious Metal	259	(31.8%)	60	\$45,948

Average wages in this industry (\$77,763) exceed both the regional and national averages when adjusting for cost-of-living differences among the states. Computer equipment and software has the highest average wages for durable goods wholesaling (\$123,431). Tennessee ranks first in the nation for average wages in sporting and recreational goods wholesaling. Tennessee also ranks fourth in the nation for transportation equipment wholesaling and metal and mineral wholesaling.

Occupations in this industry have a wide range of educational and experience requirements. The most common occupation is sales representatives of non-technical products (10.0% of total industry jobs), which requires a high school diploma or equivalent. Laborers and freight movers account for the second largest share of total jobs (7.8%). This position requires short-term on-the-job training but no formal educational credential. The durable goods wholesaling industry employs a high number of technical product sales representatives (4.6% of total industry) and general and operations managers (3.3%), both of which require a bachelor's degree and previous experience or on-the-job training.

In 2017, Tennessee's durable goods wholesalers earned \$3.6 billion. Professional and commercial equipment and supplies generated the largest earnings for Tennessee wholesalers in 2017 (\$1.3 billion), followed by machinery, equipment, and supplies (\$1.1 billion), household appliances and electronics and electronic goods (\$545.8 million), metal and mineral (\$220.2 million), miscellaneous durable goods (\$209.1 million), and furniture (\$185.6 million).



Furniture and Home Furnishing Wholesalers Employment

- > Employment growth between 2018 and 2018 (43% increase) outpaced national growth (10%)
- > 22.8% of current employment is attributable to Tennessee's unique strength in this industry⁸
- > Employment concentration: 3% below the national average
- > Total earnings (2017): \$186.6 million
- > Average earnings (\$69,601) more than \$6,000 above the U.S. industry average
- Key trends: an increase in per capita disposable income has created more industry revenue.
 Wholesalers are selling more "big-ticket" household furniture pieces. Despite growing revenue, small wholesalers are being squeezed out of the market due to direct sales between furniture manufacturers and retailers as well as large retailers like IKEA beginning to manufacture their own product.
- Opportunities for Tennessee wholesalers: Southeast region is home to largest concentration of furniture retailers in the United States⁹



Professional and Commercial Equipment and Supplies Wholesalers

- > Tennessee's key strength: medical goods wholesaling
- > Employment concentration for medical goods wholesaling ranks third in the nation and second in the region (46% above the national average)
- > Total earnings (2017): \$1.25 billion
- Medical goods wholesaling accounted for the bulk of total earnings (\$646.4 million), followed by computer equipment and software wholesaling (\$272.2 million), office equipment wholesaling (\$142.6 million), other commercial equipment wholesaling (\$109.7 million), ophthalmic goods wholesaling (\$55.9 million), and photographic equipment and supplies wholesaling (\$4.6 million)

⁸ Author's calculation using EMSI's competitive effect estimate for 2013 to 2018 (517 new jobs) divided into current 2018 employment (2,269 jobs).

⁹ IBISWorld. (2017). Comfy seat: Improving economic conditions will enable industry revenue growth.

- Key trends: across this industry, wholesalers are struggling to remain relevant to the supply chain as sales between manufacturers and retailers/consumers increase. Medical goods and ophthalmic goods wholesalers are benefiting from increased demand of healthcare services.^{10,11} Improved consumer spending has also led to new purchases by restaurant and hotel operators, benefiting other commercial equipment wholesalers.¹² Wholesalers of laboratory equipment are capitalizing on the growth of biotechnological research.¹³ Other professional equipment wholesalers face reduced demand due to new product substitutes. Digital distribution and upload services now provide the same value as copiers and fax machines, cutting into demand for office equipment wholesaling.¹⁴ Computer and computer equipment wholesalers, which generally only sell desktop computers and related accessories, have lost revenue due to the growing usage of tablets and PC alternatives.¹⁵ Smartphone cameras have undermined the camera and film wholesaling industry.
- Opportunities for Tennessee wholesalers: the Southeast is the most populous region in the nation, creating opportunities for Tennessee companies across this industry. Population density is directly correlated with the number of retailers in a region.



Metal and Mineral (except Petroleum) Merchant Wholesalers

- Metal wholesaling, one of the largest industries in the U.S. based on revenue, involves purchasing different types of metal in bulk and distributing them to downstream buyers
- > Tennessee has a much higher concentration of metal service centers and other metal merchant wholesalers (3% above the national average) than coal and ore merchant wholesalers (57% below the national average)
- Average wages in metal service centers and other metal merchant wholesaling (\$79,633)
 rank fourth in the nation and first in the region
- > Total earnings (2017): \$220.3 million, 98% of which came from metal service centers and other metal merchant wholesale
- > Key trends: although demand from construction and mining industries is growing, the global supply of nonferrous metals has increased in recent years, creating downward pressure on prices for industry products. Low prices will dampen wholesaler revenue in coming years.

¹⁰ IBISWorld. (Jul. 2018). *Steady demand: The aging population and new populations will spur steady growth.*

¹¹ IBISWorld. (Mar. 2018). Looking up: Expanding product portfolios in downstream markets will boost revenue.

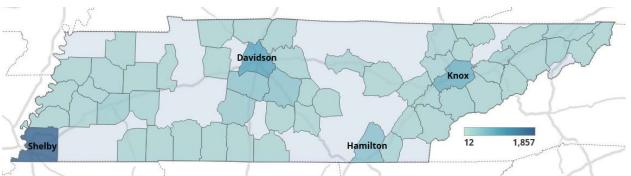
¹² IBISWorld. (Aug. 2018). Warm and inviting: Improving economic conditions will increase industry demand.

¹³ IBISWorld. (2017). *Grand scale: Biotechnology growth will offset slowed demand from pharmaceuticals*.

¹⁴ IBISWorld. (Jun. 2018). *Copy that: More customers will turn to online alternatives, hurting the industry.*

¹⁵ IBISWorld. (2017). Click away: Wholesale bypass will suppress industry revenue growth despite high demand.

Opportunities for Tennessee companies: the South is a prime location for metal wholesaling due to large population centers and proximity to downstream industries, particularly the oil and gas industry¹⁶



Household Appliances and Electrical and Electronic Goods Merchant Wholesalers

- > Employment growth rate between 2013 and 2018 (9%) outpaced the growth rate at the national level (4%) and regional level (0%)
- > 277 of the 506 new jobs created since 2013 are attributable to Tennessee's unique competitive effect in this industry
- > Total earnings (2017): \$545.8 million
- Wholesale of electrical apparatus, wiring supplies, and related equipment accounted for \$358.9 million of total earnings, followed by other electronic parts wholesale (\$122.4 million) and wholesale of household appliances, electric housewares, and consumer electronics (\$64.6 million)
- Key trends: demand for industry products is growing due to rising incomes. Appliance and electrical equipment wholesalers will enjoy increased sales and an opportunity to sell more premium, environmentally-conscious products. The long-term threat to this industry is that wholesalers are being increasingly bypassed in the supply chain. Consumers are now purchasing these products from websites rather than storefront retailers. To compensate for decreased sales, storefront retailers are negotiating with manufacturers for direct purchases of appliances.¹⁷

¹⁶ IBISWorld. (Apr. 2018). *Strategic alloys: Rising downstream demand will sustain revenues despite volatile input costs.*

¹⁷ IBISWorld. (Jul. 2018). *TV & Appliance Wholesaling in the US*.



Machinery, Equipment, and Supplies Merchant Wholesalers

- > Employment growth between 2013 and 2018 (5%) outpaced the rate of job growth at the national level (1%) and regional level (4%)
- > Tennessee's employment concentration in machinery and equipment wholesale is strong, especially for industrial supplies wholesaling (46% above the national average)
- > Wholesalers of industrial supplies specialize in general-use supplies, ranging from packaging materials to hoses, ropes, and power transmitters
- > 8% of Tennessee's employment in industrial supplies wholesaling is attributable to Tennessee's unique strength in this industry¹⁸
- > Average wages in transportation equipment wholesaling (\$96,807) rank fourth in the nation and first in the region
- > Total earnings (2017): \$1.2 billion
- > The largest share of earnings (\$527.3 million) came from industrial machines wholesaling, followed by industrial supplies wholesaling (\$199.3 million), construction and mining equipment wholesaling (\$188.7 million), farm and garden equipment wholesaling (\$119.2 million), service establishment equipment wholesaling (\$79.2 million), and transportation equipment and supplies wholesaling (\$33.0 million)
- Key trends: machinery and equipment wholesalers are benefitting from new demand. Industry revenue was buoyed from rapid growth in the construction industry, even during several sluggish years in the mining industry.¹⁹ Wholesalers are also benefitting from increased manufacturing and industrial production. Higher energy prices create new revenue opportunities for wholesalers that serve the oil and gas industry.²⁰ Agricultural equipment wholesalers had been hurt by a declining agricultural price index resulting from an oversupply of crops. Stabilization of this index will lead to greater revenues for wholesalers in coming years.²¹
- Opportunities for Tennessee companies: location to downstream markets is crucial to success in industrial supplies wholesaling. Key markets include distilleries in Kentucky and Tennessee, bottling plants in Georgia, and seafood canning near the Gulf of Mexico.²² Proximity to buyers is also a key advantage for Tennessee's farm equipment wholesalers and construction equipment wholesalers.

¹⁸ Author's calculation using EMSI's competitive effect estimate for 2013-2018 (505 new jobs) and current employment 6,270).

¹⁹ IBISWorld. (Mar. 2018). *Construction & Mining Equipment Wholesaling in the US*.

²⁰ IBISWorld. (Jul. 2018). Industrial Machinery & Equipment Wholesaling in the US.

²¹ IBISWorld. (Apr. 2018). *Farm, Lawn, and Garden Equipment in the US*.

²² IBISWorld. (2017). On the ropes: Falling manufacturing demand and rising imports will stifle industry revenue growth.



Miscellaneous Durable Goods Merchant Wholesalers

- > Average wages in sporting and recreational goods and supplies wholesaling are the highest in the nation
- > Total earnings (2017): \$209.1 million
- Revenue from sports and recreational goods wholesaling accounted for most of these earnings (\$120.5 million), followed by toy and hobby goods and supplies wholesaling (\$35.0 million) and jewelry, watch, precious stone, and precious metal wholesaling (\$53.7 million)
- Key trends: revenue has been undermined by the growth of online retailers. The sporting goods wholesaling industry has relied on specialty products to distinguish themselves from low-cost e-retailers.²³ Many establishments in the toy and hobby goods wholesaling industry have taken the opposite strategy and are focusing on sales to discount toy stores.²⁴ E-commerce has created consolidation pressures across wholesaling industries. Revenue opportunities exist for remaining wholesalers in the next few years. Rising disposable income will generate new purchases of consumer goods, particularly high-end jewelry and watch items.²⁵

Merchant Wholesalers, Nondurable Goods (NAICS 424)

Currently, Tennessee has 178 nondurable goods wholesalers, which employ 42,913 Tennesseans. Between 2013 and 2018, this industry remained mostly stagnant, adding only 2,571 new jobs. Grocery and related product accounts for the most significant percentage of employment in Tennessee, followed by drugs and druggists' sundries and miscellaneous nondurable goods. Tennessee's location quotient for this industry (0.99) demonstrates that nondurable goods wholesaling is concentrated in Tennessee at a degree comparable to the average U.S. state. In certain areas, Tennessee has demonstrated unique strengths.

NAICS	Durable Goods Category	2018 Employment	Five-Year Growth Rate (2013-2018)	Business Locations	Average Wages	
Paper and Paper Product						
424110	Printing and Writing Paper	385	62%	23	\$88,499	
424120	Stationery and Office Supplies	1,605	(12%)	103	\$53,498	
424130	Industrial and Personal Service Paper	791	(30%)	67	\$89,795	
Drugs and Druggists' Sundries						
424210	Drugs and Druggists' Sundries	6,985	2%	407	\$107,493	

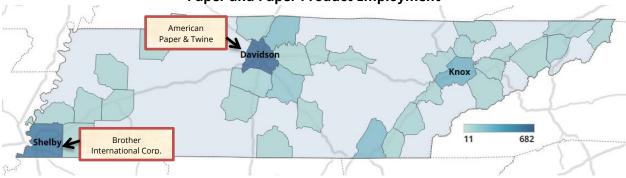
²³ IBISWorld. (2017). *Fair game: Wholesale bypass will hurt the industry, but demand will stave off major declines.*

²⁴ IBISWorld. (2017). *Not playing around: As disposable income rises, revenue will likely increase.*

²⁵ IBISWorld. (2017). *Polishing up: Rising imports and recovered consumer spending have accelerated growth.*

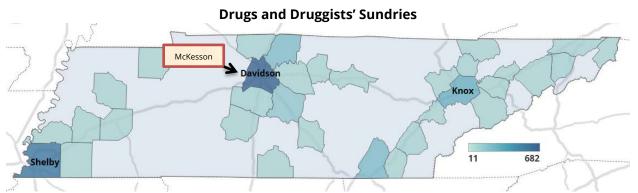
Transportation, Distribution, and Logistics Cluster

NAICS	Durable Goods Category	2018 Employment	Five-Year Growth Rate (2013-2018)	Business Locations	Average Wages
Apparel,	Piece Goods, and Notions				
424310	Piece Goods, Notions, and Other Dry Goods	194	(17%)	45	\$59,842
424320	Men's and Boys' Clothing and Furnishings	478	(6%)	39	\$57,931
424330	Women's, Children's, and Infants' Clothing	200	(69%)	46	\$57,228
424340	Footwear	2,952	51%	24	\$60,929
Grocery	and Related Product	·			
424410	General Line Grocery	5,570	(7%)	104	\$70,865
424420	Packaged Frozen Food	805	28%	36	\$82,948
424430	Dairy Product (except Dried or Canned)	512	(2%)	31	\$55,979
424440	Poultry and Poultry Product	61	(18%)	10	\$78,932
424450	Confectionery	1,070	2%	67	\$65,728
424460	Fish and Seafood	49	29%	10	\$40,249
424470	Meat and Meat Product	290	19%	31	\$61,473
424480	Fresh Fruit and Vegetable	1,414	(12%)	49	\$56,147
424490	Other Grocery and Related Products	4,100	4%	257	\$61,865
Farm Pr	oduct Raw Material				
424510	Grain and Field Bean	258	20%	30	\$65,699
424520	Livestock	530	1%	34	\$16,147
424590	Other Farm Product Raw Material	281	(27%)	28	\$130,259
Chemica	l and Allied Products	·			
424610	Plastics Materials and Basic Forms and Shapes	269	(27%)	64	\$84,505
424690	Other Chemical and Allied Products	2,217	14%	266	\$102,030
Petroleu	m and Petroleum Products				
424710	Petroleum Bulk Stations and Terminals	549	(7%)	71	\$73,922
424720	Petroleum and Petroleum Products	1,124	(8%)	97	\$83,444
Beer, Wi	ne, and Distilled Alcoholic Beverage	·			
424810	Beer and Ale	2,368	16%	57	\$75,893
424820	Wine and Distilled Alcoholic Beverage	1,480	47%	67	\$78,256
Miscella	neous Nondurable Goods	·			
424910	Farm Supplies	2,669	(7%)	172	\$69,153
424920	Book, Periodical, and Newspaper	1,241	(25%)	55	\$54,927
424930	Flower, Nursery Stock, and Florists' Supplies	692	17%	75	\$36,986
424940	Tobacco and Tobacco Product	338	(12%)	40	\$86,031
424950	Paint, Varnish, and Supplies	484	28%	47	\$88,887
424990	Other Miscellaneous Nondurable Goods	954	(12% <u>)</u>	119	\$45,961



Paper and Paper Product Employment

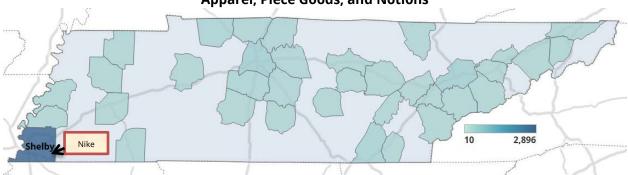
- > For industrial and personal service paper wholesaling, Tennessee ranks second in the nation and first in the region for employment concentration (68% above the national average)
- > For paper and writing paper wholesaling, Tennessee ranks seventh in the nation and second in the region for employment concentration (67% above the national average)
- > Tennessee also ranks seventh in the nation and second in the region for employment concentration in stationery and office supplies wholesaling (53% above the national average)
- Key trends: digital media services continue to chip away at revenue for paper wholesaling. Some wholesalers have had to close up shop, while others are looking to maintain revenue by investing in automated inventory management or focusing on premium, non-traditional products like coated and laminated papers and cardstock.²⁶



Key trends: revenue is growing due to the Patient Protection and Affordable Care Act (PPACA). Higher rates of insurance in the U.S. resulted in increased purchases of pharmaceutical products. Wholesaler revenue was slightly dampened by a wave of patent expirations. The U.S. recently hit the "patent cliff," which resulted in numerous drug-makers losing their patent. An influx of generics hit the market, undercutting wholesaler prices. Industry revenue should continue to grow despite countervailing trends.²⁷

²⁶ IBISWorld. (Jul. 2018). *Paper trails: As digital media prevails, paper wholesalers will struggle to remain relevant.*

²⁷ IBISWorld. (2017). Cost of living: Due to patent expirations, operators will negotiate new supplier contracts.



Apparel, Piece Goods, and Notions

- > For footwear wholesaling, Tennessee ranks first in the nation for employment concentration and second in the nation behind California for total employment
- > Tennessee also had the largest net job creation between 2013 and 2018 of any state for footwear wholesaling
- Key trends: revenue for this industry has declined due to increasing import penetration and reduced prices. American apparel manufacturers are shifting production overseas to take advantage of cheaper labor markets, forcing downward pressure on prices for industry products. Another trend negatively impacting revenue is vertical integration, in which major apparel companies control more steps in the supply chain. Many apparel wholesalers exited the market in response to these trends.²⁸



Key trends: consolidation has been the driving force in recent changes in this industry. The top four grocery wholesalers in the U.S. control more than half the market, while other establishments tend to be very small, locally-focused operations. Small establishments will have the best change of adapting by targeting niche markets in the years ahead.²⁹

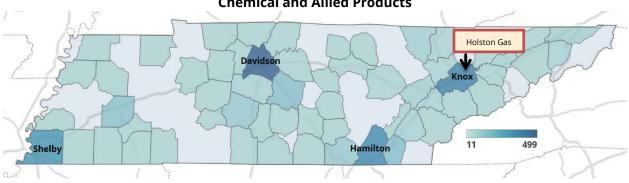
²⁸ IBISWorld. (2017). Falling to pieces: Import competition and wholesale bypass will continue to limit growth.

²⁹ IBISWorld. (Jun. 2018). Farm fresh: Rising per capita disposable income and emerging niche markets will support revenue.

Transportation, Distribution, and Logistics Cluster



- For other farm product raw materials wholesaling, Tennessee ranks second in the nation for > average earnings
- Tennessee also ranks eighth in the nation and third in the region for employment > concentration (64% above the national average)
- Key trends: this industry is most resistant to wholesale bypass of any nondurable good > wholesaling industry. While some farmers purchase their materials directly from manufacturers, many rely on wholesalers. Other factors, such as seed prices and energy costs, have a much larger impact on this industry. Revenue declined sharply in recent years due to falling feedstock prices. Farm supplies wholesaling will benefit from the growing adoption of GMOs in agriculture, which will produce larger yields and require new types of products for wholesalers to offer.³⁰

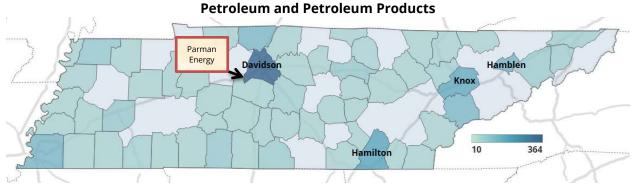


Chemical and Allied Products

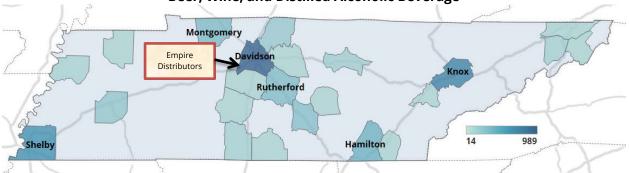
- For other chemical products wholesaling, Tennessee ranks sixth in the nation and second in > the region for average wages
- Key trends: revenue is growing for chemicals wholesalers. Demand continues to increase for > these wholesalers' two key downstream markets: construction and general manufacturing. Chemicals wholesalers will also enjoy new revenue opportunities as oil and gas prices recover. Many establishments in this industry are located in the Southeast region due to proximity to fertilizer manufacturing plants and oil refineries.³¹

³⁰ IBISWorld. (2017). Tainted harvest: Large drops in fertilizer and feed prices have caused significant revenue declines.

³¹ IBISWorld. (2017). Chemical imbalance: Lower input prices have caused lower selling prices, hindering revenue growth.

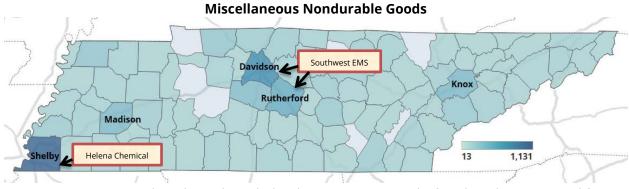


Key trends: rebounding gasoline prices will create revenue opportunities for this industry in the next few years. Adoption of hybrid vehicles and technology will likely not be widespread enough to dent industry revenue.³²



Beer, Wine, and Distilled Alcoholic Beverage

- > Tennessee's job growth in wine and distilled alcoholic beverage wholesaling tied for the third highest in the nation between 2013 and 2018
- Key trends: legislation strongly protects this industry and prevents consolidation of breweries and retailers. Nearly all states in the U.S. have laws requiring a three-tier distribution system, in which alcohol manufacturers, wholesalers, and retailers must be distinct from one another.³³



> For paint, varnish and supplies wholesaling, Tennessee ranks fourth in the nation and first in the region for average wages

³² IBISWorld. (Jun. 2018). *Big tank: Product prices are projected to increase as demand for fuel expands worldwide*.

³³ IBISWorld. (Aug. 2018). *Double shot: Growth in per capita expenditure on alcohol will support industry revenue growth.*

- > Tennessee ranks fifth in the nation and first in the region for average wages in farm supplies wholesaling
- > Tennessee also ranks sixth in the nation and first in the region for average wages in miscellaneous nondurable goods wholesaling
- > For book, periodical, and newspaper wholesaling, Tennessee ranks sixth in the nation and second in the region for employment concentration (62% above the national average)

Average wages across nondurable goods wholesaling in Tennessee are \$81,802. These wages were the fourth highest in the nation and highest in the Southeast region. Many of the top occupations in this industry require only a high-school diploma or equivalency and short-term to moderate job training. These occupations include sales representatives for technical and scientific products (9,545 currently employed in the Tennessee labor force), sales representatives for non-technical or scientific products (21,993), stock clerks and order fillers (57,147), heavy and tractor-trailer truck drivers (66,407), and laborers and freight stock movers (92,540).

Retail Trade

Wholesale Electronic Markets and Agents and Brokers (NAICS 425)

This industry encompasses two types of establishments: business-to-business (B2B) electronic markets (NAICS 425110) and wholesale trade agents and brokers (NAICS 425120). Agents and brokers act on behalf of buyers in negotiating wholesale purchase of goods. Major Tennessee companies in this industry include Bridgestone Americas Tire Operations (Davidson), Advantage Sales & Marketing (Sullivan), Radial South (Shelby), PL Marketing (Shelby), and IDEXX Distribution (Davidson). B2B electronic markets create a forum in which buyers and sellers can exchange goods, usually for a fee. Notable companies include Essendant Co. (Shelby) and Coastal Supply Co. (Knox).

Currently, 16,406 Tennesseans are employed in this industry. Wholesale trade agents and brokers accounts for nearly all employment in this industry (15,843 jobs) and the vast majority of establishments (4,451 out of 4,501 total). Wholesale trade agents and brokers are distributed widely across the state, with the strongest concentration of employment and establishments located near Tennessee's major cities. The counties with leading employment are Shelby (2,647 jobs), Davidson (1,736), and Knox (1,419). The next largest locations for employment are also located within a prominent Tennessee MSA: Williamson (903), Sullivan (897), and Hamilton (713). Wholesale trade agents and brokers are located in 90 Tennessee counties, with 66 counties having less than 50 total jobs. Non-employer firms are very common in this industry. B2B electronic markets are also located Tennessee's major population hubs. Leading counties for employment are Shelby (229 jobs), Rutherford (90), and Knox (73). Only 21 counties in Tennessee have a B2B electronic market.

Employment concentration is almost equal in Tennessee for wholesale trade agents and brokers and B2B electronic markets. The trade agents and brokers industry is 13% smaller in Tennessee than the average U.S. state. Tennessee's B2B electronic markets industry is 18% smaller than the average state.

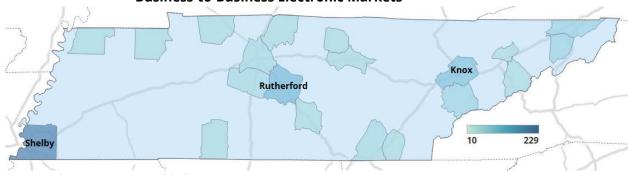
The supply chain is very similar for these industries. Trade agents and brokers rely on the same type of occupations as B2B electronic markets. Key occupations include sales representatives (for both technical and non-technical products), customer service representatives, laborers and material movers, office clerks, stock clerks and order fillers, and general and operations managers. Establishments in this industry rely on the same types of inputs as well. The largest purchase

categories for this industry in 2017 were corporate, subsidiary, and regional managing offices, couriers and express delivery services, and general warehousing and storage providers.

Increased revenue for B2B electronic markets will trade off with revenue for wholesale trade agents and brokers. Electronic markets allow manufacturers to sell directly to consumers without the use of agents and brokers. The wholesale trade agent and brokers industry will have an opportunity to grow revenue by negotiating more purchases on behalf of corporate clients and charging higher commissions for their services.³⁴



- Location quotient: 0.87
- > Average wages (\$108,928) rank third in the region and tenth highest in the nation
- > 2017 earnings: \$1.8 billion
- > 2017 total sales: \$5.3 billion (71% of which were in-region)



Business-to-Business Electronic Markets

- > 563 employees at 50 establishments
- > Location quotient: 0.82
- > Average wages (\$75,824)
- > 2017 earnings: \$57.0 million
- > 2017 total sales: \$165.5 million (76% were in-region)

Electronic Shopping and Mail-Order Houses (NAICS 454110)

This industry consists of retailers that sell their product in non-storefront venues, such as mail-order catalogs and websites. This industry also includes large retailers with distinct electronic

³⁴ IBISWorld. (2017). *Trade up: Profit is anticipated to grow due to larger commission volumes.*

sales divisions and dedicated fulfillment centers, such as Amazon and Walmart. Currently, Tennessee's electronic shopping and mail-order companies employ 7,262 workers at 470 locations across the state. Employment increased by 25% between 2013 and 2018. This industry was growing rapidly across the nation, with U.S. employment increasing by 43%. Establishment growth was also strong in Tennessee. Total establishments increased from 342 to 470. Five counties (Wayne, Van Buren, Unicoi, Decatur, and Lauderdale) added their first establishment since 2012.

This industry is located in every Tennessee county except Moore, Lake, and Hancock. 70 of these counties have at most 25 employees and four total establishments. Counties with significant employment in this industry tend to be located near Tennessee's major cities. Knox County leads the state for employment with 1,752 total jobs. Knox's biggest employer in this industry is America's Collectibles Network Inc. in Knoxville. Other important counties for this industry are Shelby (1,182 jobs), Davidson (1,162), Williamson (464), Sevier (444), and Hamilton (244). Other companies in Tennessee for this industry include TJX Digital Inc. (Shelby), Saks Off Fifth (Davidson), Smoky Mountain Knife Works Inc. (Sevierville), Williams-Sonoma Direct Inc. (Shelby), Houzz Inc. (Davidson), ExcelleRx Inc. (Shelby), and Frisenius Medical Care Rx LLC (Williamson).



Tennessee's location quotient in this industry (0.73) is slightly lower than the average state. Electronic shopping and mail-order houses have grown significantly in the U.S. due to the success of online retailers like Amazon.

Average wages in Tennessee for this industry are \$48,836, with \$42,393 in wages and \$6,443 in supplements. Most occupations in this industry require a high school diploma or equivalent or short-term on-the-job training with no specific educational requirement. The most common occupations are customer service representatives (10.9% of total industry jobs), order clerks (10.6%), retail salespersons (7.9%), laborers and freight movers (7.1%), and shipping, receiving, and traffic clerks (6.7%). Occupations that require a bachelor's degree, such as buyers and purchasing agents and general and operations managers, comprise less than 5% of total industry employment.

In 2017, Tennessee's electronic shopping and mail-order houses earned \$463.2 million after completing \$1.2 billion in sales, 35% of which were to in-state customers. Companies in this industry rely heavily on business support industries. Major industry purchases include corporate, subsidiary, and regional managing offices, buildings and dwellings lessors, offices of real estate agents and brokers, general warehousing and storage, and advertising agencies.

Revenue for electronic shopping has grown enormously in the last decade and will continue to do so. Widespread adoption of the Internet, faster Internet speeds, increasing web access on mobile devices, and convenience of online shopping has created surging demand for this industry.³⁵ Mail order houses have been adversely impacted by the growth of e-commerce. Many establishments classified under the mail order industry are now offering their own online shopping

³⁵ IBISWorld. (July 2018). Next-day delivery: Brick-and-mortar markets will provide growth opportunities for the market.

portals for customers. Revenue will grow slightly for this industry, buoyed by increased catalog purchases by corporate clients.³⁶

Transportation and Warehousing

General Freight Trucking (NAICS 484121)

This industry is one of the strongest in Tennessee's logistics cluster. Currently, these establishments employ 31,419 Tennesseans at 1,214 business locations. Tennessee ranks third in the nation and first in the region for employment. Tennessee's employment concentration (152% above the average state) is the fourth highest in the nation behind Nebraska, Arkansas, and Iowa. Between 2013 and 2018, Tennessee's industry shrank by 4%.

Freight trucking has employment and establishments in every county in Tennessee. The counties with the highest level of employment are located within Tennessee's metropolitan statistical areas: Shelby (6,025 jobs), Hamilton (4,083), Davidson (3,992), Rutherford (2,228), and Knox (1,358). Nashville ranks 10th for employment among all MSAs in the US. Shelby County ranks ninth among US counties. Other important counties for this industry in Tennessee are Bedford (922 jobs), Greene (732), Johnson (691), and Lawrence (479). Johnson County has the highest employment concentration of any US county. The Shelbyville and Lawrenceburg MSAs rank fourth and sixth in the nation respectively for employment concentration.



Major employers include Covenant Transport Inc. (Hamilton), Western Express Inc. (Davidson), Ozark Motor Lines Inc. (Shelby), Swift Transportation Co. of Arizona (Shelby), and YRC Worldwide (Davidson). Establishments in this industry are on average much smaller in size that other types of logistics companies. Tennessee's freight truck companies employ on average 40 workers, which is the fourth highest in the nation. Across the U.S., establishments in this industry have less than 16 workers on average.

Average wages in Tennessee for this industry (\$60,912) are the highest in the Southeast and almost \$10,000 greater than the national average. Many occupations in this industry require only short-term or on-the-job training and no postsecondary degree, such as heavy and tractor-trailer truck drivers (20,677 employed by this industry), laborers and freight, stock, and material movers (2,278), and light trucks or delivery services drivers (941). Other key occupations require at least a high school degree as well as long-term on-the-job training, such as mechanics and engine specialists (964 jobs).

In 2017, this industry earned \$2.2 billion. Only 38% of sales made by freight trucking services were to other businesses in the state. E-commerce has increased demand for industry services in

³⁶ IBISWorld. (July 2018). *Shipping out: Operators will introduce e-commerce platforms to compete with online retailers*.

the last five years. An increase in per capita disposable income in the U.S. as well as increased manufacturing projects should ensure continued growth in the freight trucking industry. Moreover, fuel prices are expected to increase. Higher fuel prices create an opportunity for the freight trucking industry. Companies can pass these costs downstream, resulting in greater revenue. The key challenge facing this industry will be competition from the rail industry.³⁷

Specialized Freight (except Used Goods) Trucking, Long-Distance (NAICS 484230)

Tennessee's 199 specialized freight trucking companies employ 7,557 individuals in the state. Companies in this industry provide long-distance trucking for refrigerated product, bulk liquid, waste, hazardous material, and automobile carriers. Tennessee currently ranks second nationally behind Texas for employment. Tennessee's employment concentration for specialized freight trucking (2.61) ranks fifth in the nation and third in the region behind Mississippi and Alabama. Employment decreased by 17% since 2013, a net decrease of roughly 1,500 jobs. Establishments actually increased from 159 businesses in 2012 to 199 today, suggesting an influx of small establishments into the market while major players paired down employment. Knox County sustained the biggest losses in this time period (a net decrease of 1,528 jobs since 2013).

62 counties in Tennessee have employment in this industry. The bulk of Tennessee's employment (4,620 jobs) is located in Hamilton County, home to U.S. Xpress Inc. Hamilton County's establishments are significantly larger on average than most counties. Specialized freight companies in Hamilton employ 231 workers per location on average, as compared to the state-wide average of 38 employees. For most counties with industry employment, small companies with 10 or fewer employees are the norm. Companies of this size are even common in counties with substantial levels of employment. Shelby County employs 890 in this industry, with 34 employees on average per business.

In addition to U.S. Xpress in Chattanooga, other major companies in Tennessee include Builders Transportation Co. (Shelby), Dean Transportation Inc. (Hamilton), Sims, Doyle & Sons Trucking Inc. (Weakley), and Marten Transport (Shelby).



Average wages in Tennessee for this industry are \$56,230, with \$45,550 in wages and an additional \$10,769 in supplements. The most common occupation in this industry is heavy and tractor-trailer truck drivers, which comprise 64% of total industry jobs. This position usually requires a non-degree award from a postsecondary institution as well as short-term on-the-job training. Other occupations in these industries require a high school diploma or equivalent with on-the-job training, including laborers and freight movers (7.4% of total industry jobs), bus and truck mechanics

³⁷ IBISWorld. (Jul. 2018). The long haul: Revenue will rise with increased trade and overall growth in industrial production.

(3.3%), first-line supervisors of transportation and material moving workers (2.8%), dispatchers (2.7%), and office clerks (2.1%).

In 2017, Tennessee's specialized freight operators earned \$441.8 million after completing \$1.3 billion in sales, 36% of which were made to other businesses in the state. Freight operators rely heavily on energy providers and other logistics companies. Major industry purchases in 2017 were petroleum refineries, couriers and express delivery services, the US Postal Service, freight transportation arrangement, and corporate, subsidiary, and regional managing offices.

Revenue is expected to grow due to increasing per capita disposable income. Greater consumer purchases will create demand for specialized freight trucking for automobiles, manufacturing inputs, and other products. Growth of the construction sector will spur demand for transportation of heavy machinery and building materials.³⁸

Freight Transportation Arrangement (NAICS 488510)

Currently, Tennessee has 371 businesses in this industry, with total employment of 7,684. Tennessee ranks third in the region and ninth in the nation for employment in freight transportation. Since 2013, Tennessee has added 1,218 new jobs in this industry. This five-year growth rate (19%) was equal to the national growth rate.

This industry is located in 84 out of Tennessee's 95 counties. Most of Tennessee's employment is located in Shelby County (3,066 jobs). Other important counties are located near the Nashville MSA: Wilson (936), Davidson (899), Williamson (691), and Rutherford (589). For most counties in the state, the average business employs 10 or fewer workers. However, the average establishment size is very large in some counties. Cumberland has 253 jobs but only two companies. Wilson County has 936 jobs and 12 total establishments. Small companies are common in this industry due to the low-cost of market entry and strong demand for industry services. Large establishments maintain an advantage over small operators. Companies with substantial resources can achieve lower prices for carriers by aggregating shipments and booking shipments in advance.



Tennessee's location quotient for this industry (1.53) is the fourth highest in the nation and the second highest behind Georgia. Wilson County has the ninth highest employment concentration of any U.S. county. Crossville, Tennessee has the third highest employment concentration among the nation's metropolitan statistical areas.

Average wages in this industry (\$71,018) are the fourth highest in the nation and second in the region to Georgia. Key occupations in this industry include heavy and tractor-trailer truck drivers (10.4% of total industry jobs), cargo and freight agents (9.2% of total industry), laborers and freight movers (9.1%), first-line supervisors of office and administrative support workers (6.2%), and customer service representatives (6.1%). Truck drivers are the only occupation in this group to

³⁸ IBISWorld. (May 2018). Long haul: Continued economic recovery will further lift demand for industry services.

require more than a high school diploma or equivalent. Truck drivers typically require a postsecondary non-degree award and short-term on-the-job training.

Total earnings in 2017 were \$569.1 million. Tennessee companies in this industry sold \$1.5 billion worth of product and services. 56% of these total sales were made in-region, which satisfied 80% of local demand. The largest customer of industry services are couriers and express delivery services, followed by general freight trucking, inland water freight transportation, and freight transportation arrangement. Key industry inputs include services from other general freight operators, couriers and express delivery services, the US Postal Service, and general warehousing and storage providers.

Revenue is likely to increase in coming years due to higher consumer spending, e-commerce growth, and increasing manufacturing output. Tennessee companies benefit from being located in the Southeast. The Southeast region not only has a large population; it is home to high levels of manufacturing operations and many major US ports, including the Port of Memphis.³⁹

Other Support Activities for Transportation (NAICS 48899)

This cluster includes two support activities for transportation industries: packing and crating (NAICS 488991) and all other support activities for transportation (NAICS 488999). Companies in packing and crating specialize in the preparation of goods for transportation. Services covered by miscellaneous support activities include arrangement of carpools or vanpools, independent pipeline terminal facilities, and specific types of stockyards.

543 Tennesseans are employed in packing and crating. Tennessee's location quotient for packing and crating services (1.34) ranks seventh in the nation and second in the region. Employment has decreased in recent years even as the total number of establishments increased from 27 to 32.

Tennessee has almost no employment in all other support activities for transportation (only 34 employees). Tennessee's location quotient (0.11) is significantly lower than the average state. Tennessee compares very strongly to the rest of the nation for industry wages. Average wages (\$82,405) are the second highest of any state besides Texas.

In 2017, Tennessee's companies in this industry earned \$28.8 million, \$25.5 million which came from packing and crating specifically. These companies rely heavily on purchases from couriers and express delivery services, freight transportation arrangement, the US Postal Service, general warehousing and storage, and corporate, subsidiary, and regional managing offices. Key occupations include packers and packagers, laborers and freight movers, heavy and tractor-trailer truck drivers, stock clerks and order fillers, and customer service representatives.

Companies in this industry will have an opportunity to grow revenue over the next few years. Trends like increased industrial production, increased freight volume, and greater consumer spending will create additional demand for industry services, particularly packing and crating. In 2017, Tennessee companies provided the most services to couriers and express delivery services, general freight trucking, and inland water freight transportation.

³⁹ IBISWorld. (Jun. 2018). *Chugging along: US economic growth and increased consumer spending will boost demand*.



- 543 employees at 32 establishments >
- Tennessee's location quotient (1.34) ranks seventh in the nation and second in the region >
- Since 2012, employment has declined even as establishments increased from 27 to 32 >
- Average wages: \$39,641 >
- 2017 earnings: \$25.5 million (\$67.3 in total sales) >



All Other Support Activities for Transportation

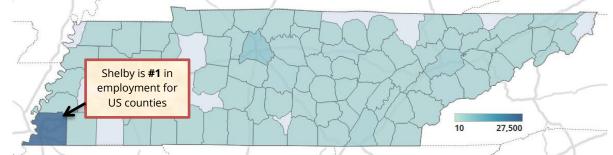
- 34 employees at 5 establishments >
- Employment and total establishments have declined in recent years >
- Location quotient: 0.11 >
- Average wages (\$82,405) rank second in the nation behind Texas >
- 2017 earnings: \$3.3 million (\$8.6 million in total sales) >

Couriers and Express Delivery Services (NAICS 4921)

Currently, 39,356 Tennesseans are employed by couriers and express delivery services. Establishments in this industry include courier services (including air couriers), express delivery services, and local parcel delivery services. Tennessee's employment in this industry ranks first in the region and third nationally behind California and Texas. Tennessee's location quotient (3.03) is second in the nation behind Kentucky.

Between 2013 and 2018, employment increased by 10.6% in Tennessee. This industry has been experiencing rapid growth across the country. Every state besides Alaska added more industry jobs during this time period. This recent growth is due to new same-day delivery services offered by major online retailers like Amazon.com. Economic recovery has been another factor driving employment growth in this industry. A healthy economy creates more demand for couriers due to increased consumer spending, more transactions between businesses, new business creation, and declining energy prices. FedEx recorded record delivery volumes during the 2017 holiday season

because of greater consumer spending.⁴⁰ Analysts expect these trends to continue, creating opportunities for continued growth in this industry over the next few years.



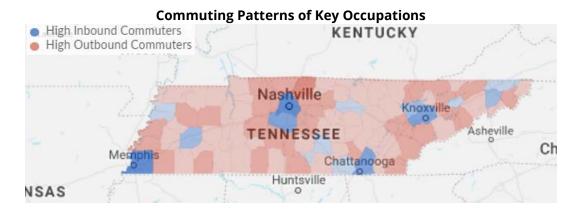
Almost 70% of Tennessee's employment (27,500 jobs) is located in Shelby County. Shelby, which has the highest employment and second highest employment concentration of any US county, is home to the FedEx Corporation headquarters. FedEx (NYSE: FDX) ranks #50 on the Fortune 500 list and is arguably the worldwide leader in this industry. The other major areas for this industry in Tennessee are Davidson County (4,699), Knox (1,880), Hamilton (898), Rutherford (540), Wilson (393), Blount (324), and Sullivan (300). The largest employers in each of these counties are either FedEx or the United Parcel Service. Tennessee has a total of 239 establishments spread across 83 of its 95 counties.

Major Employers



The average establishment size for this industry in Tennessee (164) is the highest in the nation. Average size varies substantially between Tennessee counties. This variance is attributable to the diversity of establishment types within this industry. Some couriers and messengers primarily provide B2B transactions for local clientele, while large companies like FedEx provide global delivery services for merchandisers and wholesalers. Sales to Tennessee businesses only account for 9% of total sales by Shelby County couriers. In Hawkins County, couriers made 78% of their sales in 2017 to other Tennessee businesses. Establishment size also impacts the commuting patterns of Tennesseans employed in this industry. Large establishments in this industry like FedEx in Memphis tend to attract workers from outside surrounding counties.

⁴⁰ IBISWorld. (June 2018). *Quick delivery: Rising as consumer spending and corporate profit will boost industry revenue.*



Average wages in Tennessee (\$83,233) is the second highest in the nation behind Alaska when adjusting for cost-of-living differences between states. In 2017, Tennessee's earnings for this industry were \$3.3 billion, the highest of any logistics industry in this cluster. Total sales were \$8.6 billion. Only 21% of these sales were in-region. Courier companies made the largest purchases from corporate offices, other couriers, petroleum providers, plastic products, and temporary help services. Tennessee's plastic cluster has not developed to the extent of other traded clusters so Tennessee companies rely heavily on suppliers outside the state (87.2% of total purchases).

The primary occupations employed in this industry are freight movers, drivers, supervisors, couriers and messengers, customer service representatives, conveyor operators, and shipping, receiving, and traffic clerks. Tennessee has a strong labor for this industry. Between 2013 and 2018, these occupations increased 12.0% in Tennessee as compared to 9.5% nationally. Tennessee also has a strong educational pipeline for these occupations. In 2017, Tennessee's post-secondary institutions produced 22,927 graduates across 180 programs of study with the necessary credentials to pursue a career in this industry.

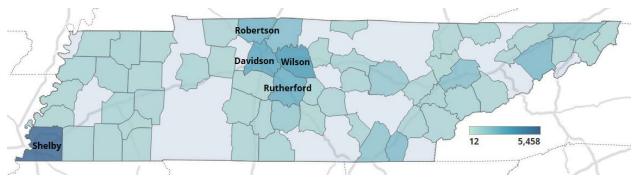
General Warehousing and Storage (NAICS 493110)

This industry employs 35,965 Tennesseans, the eighth highest level of employment in the nation and second behind Georgia. Companies in this industry, which primarily operate merchandise warehousing and storage facilities, handle boxes, barrels, and other containers. Since 2013, Tennessee's industry added 16,466 new jobs (an 83% increase). The growth rate for this industry was 58% at both the national and regional level. The continued growth of e-commerce has created more demand for general warehousing and storage.⁴¹ Tennessee added 5,196 more jobs than analysts predicted based on other factors like industry-wide growth and economic recovery. Today, more than 14% of Tennessee's jobs in this industry exist because of unique advantages of doing business in the state.⁴²

⁴¹ IBISWorld. (2018). *Clockwork storage: Growth in e-commerce will increase third-party warehousing needs.*

⁴² Author's calculation using shift share analysis and employment data in EMSI.

Transportation, Distribution, and Logistics Cluster



Industry jobs are located in 57 counties. The counties with the largest employment are located near a major Tennessee city: Shelby (5,458 jobs), Wilson (3,057), Davidson (2,425), Rutherford (2,153), and Robertson (1,834). Major employers in these areas include XPO Logistics Supply Chain Inc. (Shelby), Macy's Corporate Services Inc. (Robertson), Kroger (Davidson), Federal-Mogul Products Inc. (Rutherford), and CEBA Freight LLC (Wilson).

Greene County has the next highest employment total (1,580 jobs), surpassing several counties located within a larger MSA such as Bradley (1,362), Sumner (1,321), Knox (1,179), and Hamilton (909). Greeneville ranks among the top 25 MSAs in the US for employment concentration in this industry. Greene's largest employer is the Wal-Mart Store.

Today, Tennessee has 337 general warehousing and storage establishments. Shelby County has substantially more facilities (99) than any other county, followed by Davidson (38) and Knox (20). The average establishment in this industry in Tennessee employs 106 workers. The largest establishments tend to be located outside major MSA counties. Davidson County facilities employ 63 workers on average, compared with 916 in Robertson and 218 in Wilson. Employers in Cumberland County employ on average 2.6 times as many workers as the average Tennessee county. The same trend can be seen in Cumberland County (240 workers per facility on average) and Greene (197). Tennessee's average wages in this industry (\$46,660) are comparable to the national average (\$49,691). The most occupations in this industry are management positions (specifically, general and operations managers and transportation, storage, and distribution managers) as well as security guards, janitors and cleaners, and first-line supervisors of office and administrative support workers.

The occupations required by this industry have begun to shift. Today, warehouses are full of individual packages addressed to specific consumers rather than bulk inventory arriving on pallets. This change in packaging type, resulting from greater e-commerce transactions, has resulted in job openings in warehouses beyond material handlers and movers. The incorporation of new technology into warehouses, such as radio-frequency identification tags and automated package handling, will create greater demand for high-skilled workers to operate these devices. Average wages will grow across this industry as a result.

In 2017, Tennessee's warehousing and storage companies earned \$1.6 billion. Total sales for 2017 (half of which were to other businesses in the region) were \$2.9 billion. Revenue for this industry will grow in coming years due to greater warehousing demand from e-retailers. Other factors driving increased demand for warehousing will be increased manufacturing in the U.S., rising consumer spending, and internal cost pressures on businesses to outsource inventory management to third-party warehouse providers.⁴³

⁴³ IBISWorld. (Jun. 2018). *Clockwork storage: Growth in e-commerce will increase third-party warehousing needs.*

Other Warehousing and Storage (NAICS 49312, 49313, and 49319)

Tennessee's warehousing and storage industry encompasses three types of establishments: refrigerated, farm product, and miscellaneous. Tennessee has 71 warehousing and storage companies that employ 2,903 workers in the state.

Companies in refrigerated warehousing and storage (NAICS 493120) provide services like blast freezing, tempering, and modified atmosphere storage. Major Tennessee establishments include United States Cold Storage (Rutherford, Tipton), Interstate Warehousing Inc. (Rutherford), and Nordic Nashville LLC (Davidson). Refrigerated storage companies employ 757 Tennesseans at 17 locations. Employment grew 49% between 2013 and 2018, the fifth largest increase in the nation. Today, nearly one out of five industry jobs are attributable to Tennessee's advantageous business climate for this industry. Tennessee's employment concentration is 40% below the average state.

Farm product warehousing and storage (NAICS 493130) includes grain elevators and other establishments that offer bulk farm product storage. Companies include Longtown Supply Co. (Covington) and Federal Compress & Warehouse Co. (Shelby). Farm product warehousing employs 160 Tennesseans. Average wages are exceptionally high in Tennessee for this type of warehousing (\$83,671). Tennessee ranks second in the nation behind Indiana for average wages.

Other warehousing and storage (NAICS 493190) accounts for the most significant percentage of warehousing employment in Tennessee. These companies store any type of product not elsewhere specified, such as whiskey, documents, bulk petroleum, and lumber. Today, 38 establishments employ 1,986 workers across the state. Tennessee's employment concentration (101% above the average state) ranks fourth in the nation and second in the Southeast region behind Louisiana. Tennessee also ranks in the top ten nationally for industry employment. Tennessee's largest employers for this industry are Technicolor Distribution Co. (Shelby), Kenco Logistics Services LLC (Hamilton), and American Book Co. (Knox, Jefferson). In the last five years, the number of establishments has been increasing even as employment declined.

Warehousing and storage companies rely on the same key occupations. Nearly a quarter of employees at these companies are laborers and freight movers. The top four occupations utilized by storage companies require only short-term on-the-job training and no formal educational credential.

soc	Occupation	% of Total Industry Jobs			
300	Occupation	Refrigerated	Farm Product	Other	
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	27.0%	26.8%	27.0%	
53-7051	Industrial Truck and Tractor Operators	15.5%	15.2%	15.4%	
43-5081	Stock Clerks and Order Fillers	9.1%	8.9%	9.0%	
53-7064	Packers and Packagers, Hand	7.4%	7.3%	7.4%	

Warehousing companies also make the same types of purchases. For each segment of warehousing and storage, the most common industry purchases in 2017 were services from other warehouses, buildings lessors, offices of real estate agents and brokers, and other activities related to real estate.

Other warehousing and storage generated the largest earnings for this industry in 2017 (\$119.5 million). Companies made the most sales to couriers and express delivery services, other warehouses, general freight trucking, department stores, and warehouse clubs and supercenters. Refrigerated warehousing generated roughly a fifth of industry-wide earnings (\$40.2 million). These companies made sales to the same types of customers, with a bigger focus on supermarkets and

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other grocery stores. Tennessee's farm product warehousing and storage companies earned \$17.8 million in 2017.

Industry revenue is expected to increase over the next few years due to numerous factors, including increased international trade, rising per capita disposable income, a declining agricultural price index, and general economic recovery.



Refrigerated Warehousing and Storage

- > 757 employees at 17 locations
- > Employment growth rate from 2013 to 2018 (49%) ranked fifth in the nation and second in the region behind West Virginia
- > 19.6% of current industry is attributable to competitive effect⁴⁴
- > Location quotient: 0.60
- > Average wages (\$54,501) rank fourth in the region and are comparable to the national average (\$55,147)
- > 2017 earnings: \$40.2 million (\$74.9 million in total sales)
- Key trends: a rise in per capita disposable income has led to increased revenue for this industry. Revenue for refrigerated warehousing hinges on consumer food spending. Growing disposable income leads consumers to eat out more often, creating additional demand for industry services. Moreover, a decline in the agricultural price index has also been declining, which causes food producers to hold their product in frozen storage until market conditions become favorable for selling. Tennessee companies benefit from being located in the Southeast, which has strong food and pharmaceutical markets as well as more refrigerated storage facilities than any region in the nation.⁴⁵

⁴⁴ Author's calculation using EMSI estimates for 2018 jobs (757) and competitive effect (148).

⁴⁵ IBISWorld. (Aug. 2018). *Still defrosting: Performance will be bolstered by continued growth in the total value of trade activity.*



- > 160 employees at 17 establishments
- > Location quotient: 0.66
- Average wages (\$83,671) rank second in the nation behind Indiana and are more than 150% above the regional and national averages
- > 2017 earnings: \$17.8 million (\$33.2 million in total sales)
- Key trends: revenue will grow for these companies in coming years due to a declining agricultural price index and increased agricultural imports, which produces demand for product storage near regional markets. Increased international trade will actually undermine the unique competitive advantage that Tennessee enjoyed in years past, namely proximity to ports and regional grain producers. These factors will matter less as American producers become less competitive in export markets.⁴⁶



- > 1,986 employees at 38 establishments
- Employment ranks tenth in the nation and fourth in the region behind Florida, North Carolina, and Louisiana
- > Location quotient (2.01) ranks fourth in the nation and second regionally behind Louisiana
- > Average wages: \$51,860
- > 2017 earnings: \$119.5 million (\$223.1 million in sales)
- Key trends: given the miscellaneous nature of this type of warehousing, revenue depends on storage demand in numerous markets, including petroleum, oil and gas, chemicals, lumber, documents, and beverages. Tennessee companies that provide storage of nearby distilleries will benefit from a likely decrease in excise taxes for distilled spirits.⁴⁷

⁴⁶ IBISWorld. (Jun. 2018). *Plentiful harvest: Increased demand from biofuel producers supports a return to industry growth.*

⁴⁷ IBISWorld. (May 2018). *Safe storage: As the number of businesses grows, the demand for industry services increases.*

Administrative and Support Services (NAICS 561499 and 561910)

The logistics cluster includes two administrative and support services industries: all other business support services (NAICS 561499) and packaging and label services (NAICS 561910). In Tennessee, other business support services companies employ 1,544. Establishments in this industry handle miscellaneous business support activities such as fundraising organization services, mail presorting services, bar code imprinting services, and address bar coding services. Major employers in Tennessee include Great American Opportunities (Davidson) and ABX Cargo Services (Shelby).

Packaging and labeling service companies employ 1,317 Tennesseans. Companies in this industry provide not only packaging and kit assembly services but also gift wrapping services, shrink wrapping services, blister packaging services, and apparel and textile folding and packaging services. Major companies in Tennessee include Premier Packaging (Shelby), Aaron Thomas Co. (Shelby), and Aphena Pharma Solutions (Putnam).

Both industries have been growing in Tennessee. Tennessee's five-year growth rate of 15.8% in packaging services corresponds with industry-wide growth that was occurring across the country due to new demand from pharmaceutical manufacturers. Other business support services grew employment in Tennessee by 12% between 2013 and 2018. Demand for these industries is expected to grow in coming years, creating greater revenue opportunities for Tennessee companies.

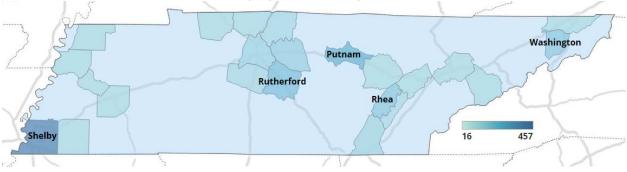
Average wages in these industries are slightly above \$40,000. Both industries rely on occupations that generally only require a high school diploma or equivalent. The most common occupations in other business support services are customer service representatives (24.7% of total industry jobs), bill and account collectors (8.5%), telemarketers (7.2%), editors (7.0%), and court reporters (4.1%). Editors typically require a bachelor's degree, while court reporters require a postsecondary non-degree award with on-the-job training. In packaging and labeling services, the most common occupations are weighers, measurers, checkers, and samplers (9.0% of total industry employment), laborers and freight movers (6.9%), stock clerks and order fillers (5.7%), packers and packagers (4.8%), and customer service representatives (3.6%). Packers, packagers, and laborers require no formal educational credential, while a high school diploma or equivalency degree is generally necessary to fill the other positions.

Total earnings for other support services (\$91.0 million) exceeded those of packaging and labeling services (\$60.0 million) in 2017. On the whole, Tennessee companies that provide miscellaneous business support services have a very local customer base. 94% of sales in this industry in 2017 were to buyers in Tennessee. Packaging and labeling services companies made only 68% of their sales to in-state customers.



- > 12% five-year growth rate (2013-2018)
- > Location quotient: 0.76
- > Average wages: \$44,474
- > Total earnings (2017): \$91.0 million
- > Total sales: \$178.8 million (94% in-region)





- > 1,317 jobs at 52 establishments
- > 15.8% of current employment attributable to Tennessee's unique competitive effect⁴⁸
- > 37% five-year growth rate (2013-2018)
- > Location quotient: 1.08
- > Average wages: \$41,157
- > Total earnings (2017): \$60.0 million
- > Total sales: \$146.5 million (68% in-region)
- In addition to cluster-wide trends like increased consumer spending and new manufacturing projects, the packaging and labeling industry benefited from regulatory changes for pharmaceutical product packaging. Pharmaceutical manufacturers chose to outsource product labeling to companies in this industry. The Drug Supply Chain Security Act has ensured the relevance of packaging and labeling companies in the pharmaceutical market. Demand for pharmaceuticals is expected to grow due to the aging U.S. population.⁴⁹

⁴⁸ Author's calculation using EMSI estimates for 2018 employment (1,317) and competitive effect (208).

⁴⁹ IBISWorld. (May 2018). Package deal: Demand for industry services will increase as consumer spending continues to grow.

Recent Projects

The logistics cluster has grown significantly as a result of the Haslam administration's economic development efforts. Since 2011, the Tennessee Department of Economic and Community Development has received 187 project commitments to create 22,483 jobs. Total capital investment for these projects has nearly reached \$5.0 billion.

Company	New Job Commitments	Capital Investment (\$)	County	Date
Under Armour	1,500	102,000,000	Wilson	10/2/2014
Academy Sports + Outdoors	700	100,000,000	Putnam	8/8/2014
DHL Supply Chain	655	81,798,125	Shelby	12/31/2016
Ryder Integrated Logistics, Inc.	606	16,508,600	Maury	8/11/2015
Amazon.com.dedc, LLC	600	35,000,000	Shelby	10/18/2017
Lowe's Companies, Inc.	600	100,020,000	Robertson	7/28/2016
Gap, Inc.	509	41,683,203	Sumner	6/9/2017
XPO Logistics	468	23,000,000	Shelby	1/16/2013
Target Corporation	462	52,280,045	Shelby	12/11/2014
Coyote Logistics	450	3,222,000	Hamilton	12/10/2012

Appendix A: Cluster Industries

Furniture Merchant Wholesalers (NAICS 423210) Home Furnishing Merchant Wholesalers (NAICS 423220) Photographic Equipment and Supplies Merchant Wholesalers (NAICS 423410) Office Equipment Merchant Wholesalers (NAICS 423420) Computer and Computer Peripheral Equipment and Software Merchant Wholesalers (NAICS 423430) Other Commercial Equipment Merchant Wholesalers (NAICS 423440) Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers (NAICS 423450) Ophthalmic Goods Merchant Wholesalers (NAICS 423460) Other Professional Equipment and Supplies Merchant Wholesalers (NAICS 423490) Metal Service Centers and Other Metal Merchant Wholesalers (NAICS 423510) Coal and Other Mineral and Ore Merchant Wholesalers (NAICS 423520) Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers (NAICS 423610) Household Appliances, Electric Housewares, and Consumer Electronics Merchant Wholesalers (NAICS 423620) Other Electronic Parts and Equipment Merchant Wholesalers (NAICS 423690) Construction and Mining (except Oil Well) Machinery and Equipment Merchant Wholesalers (NAICS 423810) Farm and Garden Machinery and Equipment Merchant Wholesalers (NAICS 423820) Industrial Machinery and Equipment Merchant Wholesalers (NAICS 423830) Industrial Supplies Merchant Wholesalers (NAICS 423840) Service Establishment Equipment and Supplies Merchant Wholesalers (NAICS 423850) Transportation Equipment and Supplies (except Motor Vehicle) Merchant Wholesalers (NAICS 423860) Sporting and Recreational Goods and Supplies Merchant Wholesalers (NAICS 423910) Toy and Hobby Goods and Supplies Merchant Wholesalers (NAICS 423920) Jewelry, Watch, Precious Stone, and Precious Metal Merchant Wholesalers (NAICS 423940) Wholesale Printing and Writing Paper Merchant Wholesalers (NAICS 424110) Trade Stationery and Office Supplies Merchant Wholesalers (NAICS 424120) Industrial and Personal Service Paper Merchant Wholesalers (NAICS 424130) Drugs and Druggists' Sundries Merchant Wholesalers (NAICS 424210) Piece Goods, Notions, and Other Dry Goods Merchant Wholesalers (NAICS 424310) Men's and Boys' Clothing and Furnishings Merchant Wholesalers (NAICS 424320) Women's, Children's, and Infants' Clothing and Accessories Merchant Wholesalers (NAICS 424330) Footwear Merchant Wholesalers (NAICS 424340) Poultry and Poultry Product Merchant Wholesalers (NAICS 424440) Fish and Seafood Merchant Wholesalers (NAICS 424460) Meat and Meat Product Merchant Wholesalers (NAICS 424470) Fresh Fruit and Vegetable Merchant Wholesalers (NAICS 424480) Grain and Field Bean Merchant Wholesalers (NAICS 424510) Livestock Merchant Wholesalers (NAICS 424520) Other Farm Product Raw Material Merchant Wholesalers (NAICS 424590) Plastics Materials and Basic Forms and Shapes Merchant Wholesalers (NAICS 424610) Other Chemical and Allied Products Merchant Wholesalers (NAICS 424690) Petroleum Bulk Stations and Terminals (NAICS 424710) Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals) (NAICS 424720) Wine and Distilled Alcoholic Beverage Merchant Wholesalers (NAICS 424820) Farm Supplies Merchant Wholesalers (NAICS 424910) Book, Periodical, and Newspaper Merchant Wholesalers (NAICS 424920) Flower, Nursery Stock, and Florists' Supplies Merchant Wholesalers (NAICS 424930) Tobacco and Tobacco Product Merchant Wholesalers (NAICS 424940) Paint, Varnish, and Supplies Merchant Wholesalers (NAICS 424950) Other Miscellaneous Nondurable Goods Merchant Wholesalers (NAICS 424990) Business to Business Electronic Markets (NAICS 425110) Retail Trade Wholesale Trade Agents and Brokers (NAICS 425120) Electronic Shopping and Mail-Order Houses (NAICS 454110)

Transportation and Warehousing	General Freight Trucking, Long-Distance, Truckload (NAICS 484121) Specialized Freight (except Used Goods) Trucking, Long-Distance (NAICS 484230) Freight Transportation Arrangement (NAICS 488510) Packing and Crating (NAICS 488991) All Other Support Activities for Transportation (NAICS 488999) Couriers and Express Delivery Services (NAICS 492110) General Warehousing and Storage (NAICS 493110) Refrigerated Warehousing and Storage (NAICS 493120) Farm Product Warehousing and Storage (NAICS 493130) Other Warehousing and Storage (NAICS 493190)
Administrative and Support Services	All Other Business Support Services (NAICS 561499)
	Packaging and Labeling Services (NAICS 561910)