THE CENTER FOR ECONOMIC RESEARCH IN TENNESSEE (CERT)

July 2024

AUTOMOTIVE

TN Department of Economic & Community Development | Center for Economic Research in Tennessee

MASTERED IN TENNESSEE

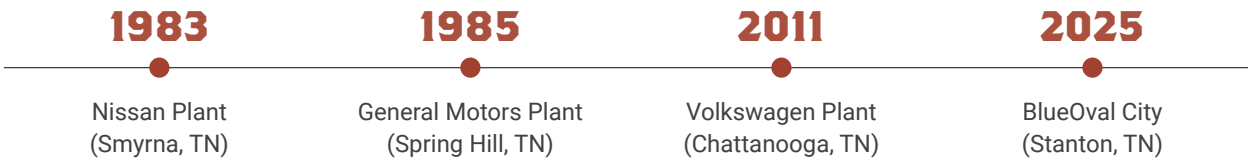
TABLE OF CONTENTS

TN Department of Economic & Community Development

INTRODUCTION

The Automotive industry is a key contributor to Tennessee's manufacturing and export activities. The launch of Nissan's plant in Smyrna in 1983 was a landmark event in Tennessee's industrial history. The Nissan plant was the third foreign-owned automotive production facility in the United States and marked a significant transition in automotive manufacturing towards the Southeast United States. Since the launch of the Nissan plant, three Original Equipment Manufacturer (OEM) automotive plants have been established in Tennessee.

Exhibit I: Automotive Plants Timeline



Tennessee has a significant automotive manufacturing presence with three major automotive assembly plants: Nissan North America (Rutherford County), General Motors (Maury County), and Volkswagen (Hamilton County). The state's automotive landscape is set to expand further by 2025 with the addition of Ford's BlueOval City (Haywood County).

Exhibit 2: Automotive Plants Summary

	Nissan	General Motors	Volkswagen	Ford
Employees	8,500	3,000	5,000	6,000 (projected)
Annual Production	369K	159K	166K	500K (projected)
Capital Investment	$7.1B	$2B (since 2010)	$4.3B	$5.3B
Models	Leaf, Maxima, Murano, Pathfinder, Rogue, QX60	Cadillac Lyriq, Cadillac XT5, Cadillac XT6, GMC Acadia	Atlas Cross Sport, ID.4	T3

Source: Crain Communications Inc., "Automotive News," (April 2024)

Tennessee's appeal for automotive investments is due to several factors, including the state's right-to-work laws, skilled workforce, strategic transportation infrastructure, and competitive economic incentives. Collectively, these elements have created an environment conducive to the generation of high-quality employment opportunities, thereby reinforcing Tennessee's position as a central location for the Automotive industry.

SPOTLIGHT: FORD MOTOR COMPANY – BLUEOVAL CITY

In 2021, Ford Motor Company announced the establishment of BlueOval City, a new campus spanning 3,600 acres in West Tennessee. The project, with an investment of $5.6 billion, is anticipated to contribute significantly to the state and local economies and the employment prospects in the region. The project is expected to generate approximately 30,000 jobs across West Tennessee, including 6,000 direct onsite positions. BlueOval City is projected to have a $3.5 billion annual impact on Tennessee's gross state product. BlueOval City is expected to begin operations in 2025 and will primarily produce Ford's next generation electric trucks.

In addition to the new campus, the project includes a partnership with the Tennessee College of Applied Technology (TCAT). This partnership aims to provide specialized industry training onsite. This training initiative is tailored to equip workers with the requisite skills for roles in Ford's advanced battery and vehicle manufacturing facilities.

INDUSTRY OVERVIEW

Tennessee has a robust Automotive cluster. Clustering optimizes logistic and supply chain management by reducing costs, fostering innovation, and supporting economies of scale. Overall, clustering improves operational efficiency and cost-effectiveness. The cluster includes tire manufacturers, electric vehicle (EV) battery manufacturers, and manufacturers of other components used by original equipment manufacturers (OEMs). The Automotive industry's share of total employment in Tennessee is threefold the national average. In 1980, the state had 49 automotive suppliers. In 2024, Tennessee has approximately 900 automotive suppliers with establishments in 88 of the state's 95 counties.[1,A]

INDUSTRY CLUSTER

An industry cluster is a geographic concentration of interconnected businesses, suppliers, and service providers.

The Automotive cluster supports more than 71,000 jobs in Tennessee.[2] Tennessee ranks the highest in the Southeast and fourth in the U.S. for employment, and second in the Southeast and seventh nationally for total number of automotive establishments.[B]

In the Southeast, Tennessee is a key employment hub in 5 out of 12 distinct industries:

- Motor Vehicle Gasoline Engine and Engine Parts
- Motor Vehicle and Electronic Equipment
- Motor Vehicle Steering and Suspension Components (except Spring)
- Motor Vehicle Metal Stamping
- Other Motor Vehicle Parts Manufacturing

In 2023, the average wage within the Automotive cluster in Tennessee was $88,329, ranking second highest in the Southeast behind Kentucky. In the cluster, highest average wages were in the Heavy Duty Truck Manufacturing ($154,669), Automobile and Light Duty Motor Vehicle Manufacturing ($115,872), and Tire Manufacturing ($87,265).[3] Wage disparities across different industries within the cluster can be attributed to a variety of factors, including the costs of materials, levels of research and development (R&D) investment, and variations in total revenue among industries. Additionally, each industry's unique cost structure and external factors – like off-shoring and increased automation– can impact industry wages.[C]

[A] See Appendix 1 for a list of top companies in this cluster.
[B] See Appendix 2 for 2023 industry employment and earning totals.
[C] See Appendix 3 for 2023 top occupations in the cluster.

SPOTLIGHT: ELECTRIC VEHICLES (EVS)

The automotive industry is currently undergoing a significant shift with the increasing prominence of EVs. This transition is driven by numerous factors, including a heightened public awareness of environmental impacts, the allure of innovative technology, and the availability of more cost-effective EV models. As the adoption of EVs gradually accelerates and consumer preferences evolve, the sector is expected to generate numerous job opportunities that span various domains, including EV manufacturing, battery production, and development of requisite infrastructure.

The state has landed several cutting-edge battery plant projects through companies such as Dongwa Electrolyte, LG Chem, Tritium, and Ultium Cell LLC. Upon completion, the LG Chem project will be the largest cathode manufacturing facility in the United States and is expected to produce approximately 120,000 tons of cathode material annually, which is enough to power batteries in 1.2 million EVs with a range of 310 miles per charge.

In 2022, General Motors (GM) finalized a $19 billion long-term agreement with LG Chem to procure over 500,000 tons of cathode materials from 2026 to 2035 for EV battery production. The materials acquired by GM will be utilized by Ultium Cells LLC, a joint venture between GM and LG Energy Solutions, aiming to bolster GM's goal of achieving a production capacity of one million EVs in North America by the end of 2025.

The Tennessee Department of Economic and Community Development (TNECD) partners with other state agencies and higher education institutions to ensure that the state can provide a skilled workforce to meet future demands of companies operating in Tennessee. The state's higher education institutions have awarded over 24,500 automotive-related degrees and certificates since 2018. Graduates in these programs have received degrees in a variety of programs including Engineering, Precision Production, and Mechanic and Repair Technologies/Technicians.

RECENT GROWTH

Since 2019, Tennessee has attracted 125 automotive projects, generating over 26,500 jobs and $20.9 billion in capital investment. Additionally, Foreign Direct Investment (FDI) in automotive operations has reached more than $14.9 billion. A significant portion of the automotive investment was from the growing EV sector, including LG Chem's record $3.2 billion investment. Under Governor Lee's administration, the state has seen over $15.8 billion in EV investments and over 13,000 job commitments. These figures include establishments within other industries serving automotive manufacturers and are not limited to those with automotive NAICS codes.

Exhibit 3: TNECD Recent Major Automotive Projects

Company	New Job Commitments	Capital Investment	County	Landed Date
LG Chem America Inc.	860	$3,205,715,854	Montgomery	11/21/2022
Cosma International of America, Inc.	750	$516,288,800	Haywood	7/20/2023
Hanon Systems USA, LLC	600	$166,615,494	Loudon	8/1/2023
Arrowhead Engineered Products	414	$19,479,800	Robertson	2/1/2023
Ultium Cells LLC	400	$275,000,000	Maury	12/2/2022
Hankook Tire Co., Ltd	397	$611,955,918	Montgomery	8/29/2022
Bridgestone Americas Tire Operations, LLC	380	$550,000,000	Warren	8/25/2022
Magna Seating of America, Inc.	295	$77,542,500	Haywood	7/20/2023
Cosma International of America, Inc.	250	$199,997,200	Lawrence	7/20/2023
6K Energy Tennessee, LLC	230	$166,388,932	Madison	4/18/2023
ATC Drivetrain	218	$8,342,110	Knox	3/16/2022
Enchem America Inc.	190	$152,500,000	Haywood	6/26/2023
Copperweld Bimetallics LLC	162	$27,000,000	Lincoln	7/31/2022
Piedmont Lithium Inc.	117	$582,053,534	McMinn	9/1/2022
Duksan Electera America, Inc.	101	$94,624,389	Bedford	7/27/2022
Nokian Tyres U.S. Operations LLC	75	$174,142,680	Rhea	1/11/2023
Otics USA, Inc.	70	$147,000,000	Hamblen	3/2/2023

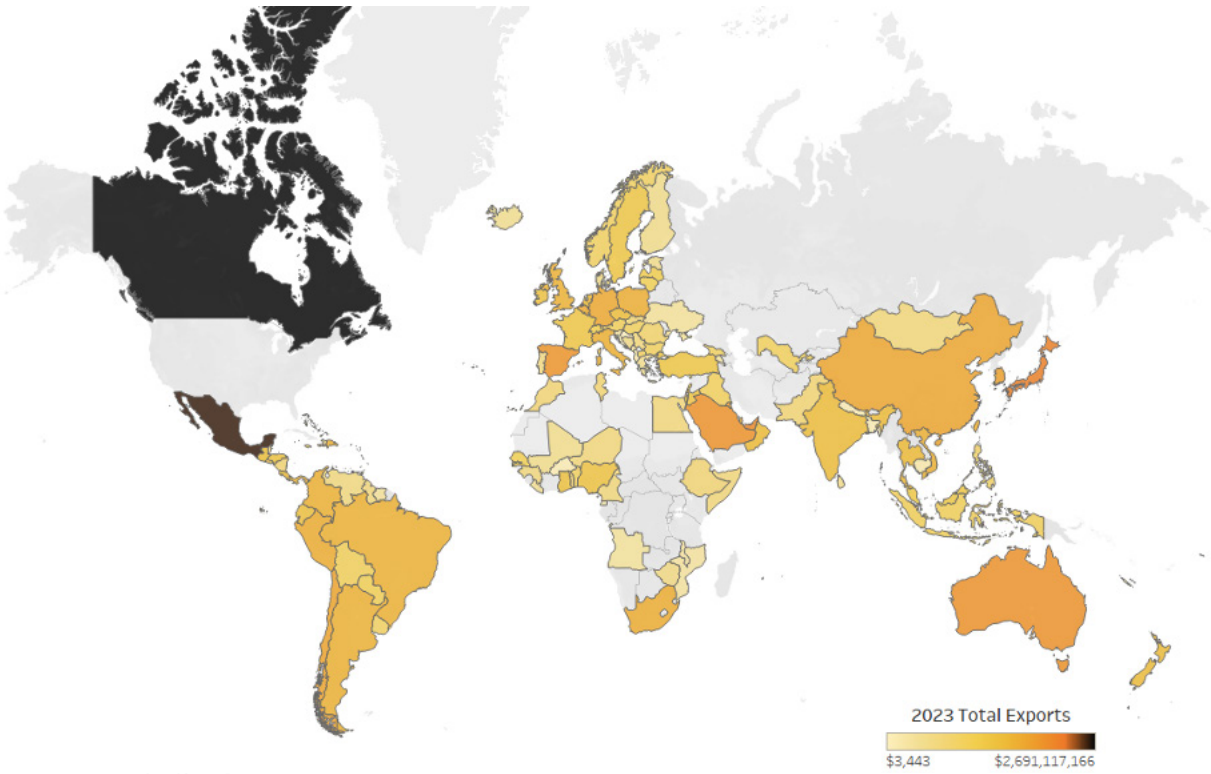
Source: Tennessee Department of Economic and Community Development (May 2024)

EXPORTS

In 2023, Tennessee's Automotive exports reached over $5.4 billion. This marked a significant 27 percent increase year over year, signaling a robust recovery from the consumer demand fluctuations and supply chain disruptions caused by the COVID-19 pandemic.[4]

Exports are anticipated to return to pre-pandemic levels in the coming years. The primary export destinations for Tennessee's automotive products include Canada ($2.6 billion), Mexico ($1.7 billion), Japan ($223.5 million), the United Arab Emirates ($153 million), and Australia ($95.6 million).[5]

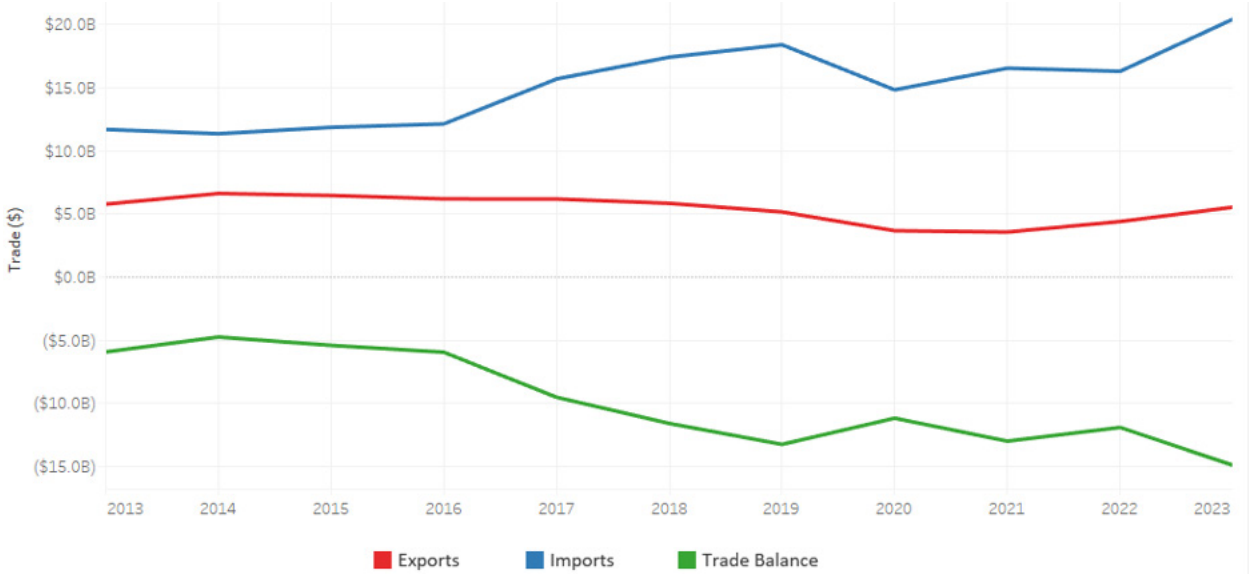
Exhibit 4: 2023 Total Exports



Source: US Census Bureau, "USA Trade Online," (April 2024)
Note: A logarithmic transformation was applied to the employment data to enhance the visualization. The mathematical adjustment ensures a more uniform distribution of data, making variations across other countries more discernible.

Tennessee leads the Southeast in exporting Motor Vehicle Parts, ranking first regionally and ninth across the United States. In terms of total automotive exports, the state is fourth in the Southeast and eleventh nationwide. Tennessee's trade balance experienced a sharp rise in imports around 2016, contributing to a negative trade balance for the industry. There was a decline in imports in 2019 and increased once again in 2020, likely due to the COVID-19 pandemic. In 2023, Tennessee ranked third in the Southeast for exports, behind South Carolina and Alabama.

Exhibit 5: 2013-2023 Automotive Cluster Trade Balance



Source: US Census Bureau, "USA Trade Online," (April 2024)

In 2023, the Motor Vehicle Manufacturing industry (NAICS 3361) represented the largest portion of export earnings for Tennessee's Automotive cluster, with exports totaling $2.57 billion. The major export destinations for these products included Canada ($1.8 billion), Mexico ($292.3 million), and the United Arab Emirates ($120.3 million). The Motor Vehicle Parts industry (NAICS 3363) constituted the second largest share of the state's automotive exports, reaching $2.07 billion in 2023. The primary markets for these parts were Mexico ($916.3 million), Canada ($572.1 million), and Japan ($209.5 million). Exports in the Motor Vehicle Bodies and Trailers industry (NAICS 3362) totaled $228.7 million in 2023. The leading markets for these exports were Mexico ($123.9 million), Canada ($75.8 million), and the United Arab Emirates ($3.6 million).[6]

FUTURE OUTLOOK

The Automotive sector is undergoing a significant transformation due to global trends and COVID-19 disruptions. The pandemic particularly impacted supply chains and manufacturing processes, leading to component shortages, like semiconductors, and a global chip shortage that hampered vehicle production and escalated costs. This period has also led to shifts in consumer behaviors towards transportation, influenced by remote work and lifestyle changes.

Additionally, concerns for environmental sustainability are increasingly important to the Automotive sector. Globally, governments are implementing policies to reduce carbon emissions and promoting the adoption of electric vehicles (EVs) through various supportive measures. Automakers are thus channeling resources into EV and hybrid vehicle innovation, supported by government incentives like tax breaks and subsidies. One primary challenge for the adoption of EVs, though, is overall consumer hesitancy in purchasing EVs. Some consumer concerns include higher upfront costs, limited charging infrastructure, and vehicle range concerns. To address these concerns, the Automotive industry is improving battery technology, expanding charging infrastructure, and developing cost-effective EV models.

Tennessee has recently landed several cutting-edge battery plant projects with companies like Dongwa Electrolyte, LG Chem, Tritium, and Ultium Cell LLC. Recent developments in Tennessee's Automotive industry underscore the state's commitment to maintaining a leading position in automotive innovation and reflect its ability to adapt to technological advancements, particularly in the expanding field of EV manufacturing.

APPENDICES

Appendix 1: 2023 Top Automotive Companies for Employment

Company	County	Employment	NAICS Industry Category	NAICS Code
Nissan North America, Inc.	Rutherford	8,500	Automobile Manufacturing	336111
Volkswagen Group of America Chattanooga Operations, LLC	Hamilton	5,043	Automobile Manufacturing	336111
Denso Manufacturing Tennessee, Inc.	Blount	4,557	Other Motor Vehicle Parts Manufacturing	336390
DENSO International America, Inc.	Wilson	4,150	Motor Vehicle Supplies and New Parts Merchant Wholesalers	423120
Yates Services, LLC.	Rutherford	3,374	Automobile Manufacturing	336111
General Motors LLC	Maury	2,679	Automobile Manufacturing	336111
Bridgestone Americas, Inc.	Davidson	1,894	Corporate, Subsidiary, and Regional Managing Offices	551114
Nissan North America, Inc.	Williamson	1,850	Corporate, Subsidiary, and Regional Managing Offices	551114
AutoZone, Inc.	Shelby	1,725	Corporate, Subsidiary, and Regional Managing Offices	551114
Nissan Power Train Assembly, Decherd	Franklin	1,700	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310

Source: Tennessee Department of Economic and Community Development (April 2024)

Appendix 2: 2023 Industry Totals

Industry Category	NAICS	2023 Jobs	2023 Business Locations	Employment Growth Rate (2018-2023)	2023 GRP Earnings	Southeast Ranking	National Ranking
RUBBER PRODUCT MANUFACTURING							
Tire Manufacturing	32621	4,824	26	14%	$413,370,018	3	3
MOTOR VEHICLE MANUFACTURING							
Automobile and Light Duty Motor Vehicle	33611	19,852	38	4%	$2,360,564,580	3	6
Heavy Duty Truck Manufacturing	33612	21	6	-16%	$3,922,414	6	30
MOTOR VEHICLE BODY AND TRAILER MANUFACTURING							
Motor Vehicle Body and Trailer Manufacturing	33621	3,085	73	30%	$237,942,623	5	15
MOTOR VEHICLE PARTS MANUFACTURING							
Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	33631	4,676	46	-7%	$364,621,162	1	3
Motor Vehicle Electrical and Electronic Equipment Manufacturing	33632	7,473	45	18%	$626,527,977	1	2
Motor Vehicle Steering and Suspension (except Spring) Manufacturing	33633	3,889	25	-30%	$307,774,632	1	3
Motor Vehicle Brake System Manufacturing	33634	994	12	-38%	$66,494,575	4	7
Motor Vehicle Transmission and Power Train Parts Manufacturing	33635	1,864	19	-27%	$130,906,508	4	9
Motor Vehicle Seating and Interior Trim Manufacturing	33636	6,489	37	-13%	$450,441,230	2	4
Motor Vehicle Metal Stamping	33637	7,110	42	14%	$573,699,274	1	3
Other Motor Vehicle Parts Manufacturing	33639	11,172	85	-4%	$884,488,149	1	4

Source: Lightcast (April 2024)

Appendix 3: 2023 Automotive Industry Top Occupations

SOC	Occupation	Employment	Median Hourly Wage	Typical Entry Level Required
MANAGEMENT OCCUPATIONS				
11-3051	Industrial Production Managers	5,151	$48.08	Bachelor's degree
ARCHITECTURE AND ENGINEERING OCCUPATIONS				
17-2112	Industrial Engineers	7,017	$40.70	Bachelor's degree
17-3026	Industrial Engineering Technologists and Technicians	2,672	$25.40	Associate degree
OFFICE AND ADMINISTRATIVE SUPPORT OCCUPATIONS				
43-5061	Production, Planning, and Expediting Clerks	12,144	$22.36	High school diploma or equivalent
43-5071	Shipping, Receiving, and Inventory Clerks	20,256	$17.92	High school diploma or equivalent
CONSTRUCTION AND EXTRACTION OCCUPATIONS				
47-2111	Electricians	15,642	$25.55	High school diploma or equivalent
INSTALLATION, MAINTENANCE, AND REPAIR OCCUPATIONS				
49-9041	Industrial Machinery Mechanics	9,327	$28.75	High school diploma or equivalent
49-9043	Maintenance Workers, Machinery	4,590	$25.57	High school diploma or equivalent
49-9071	Maintenance and Repair Workers, General	35,656	$19.16	High school diploma or equivalent
PRODUCTION OCCUPATIONS				
51-1011	First-Line Supervisors of Production and Operating Workers	18,074	$29.66	High school diploma or equivalent
51-2028	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers	4,605	$18.50	High school diploma or equivalent
51-2098	Miscellaneous Assemblers and Fabricators	55,323	$18.26	High school diploma or equivalent
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	6,260	$18.13	High school diploma or equivalent
51-4041	Machinists	8,977	$22.66	High school diploma or equivalent
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	4,677	$17.61	High school diploma or equivalent

Source: Lightcast (April 2024)

Appendix 3: 2023 Automotive Industry Top Occupations (continued)

SOC	Occupation	Employment	Median Hourly Wage	Typical Entry Level Required
PRODUCTION OCCUPATIONS				
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	3,728	$18.76	High school diploma or equivalent
51-4111	Tool and Die Makers	4,347	$22.97	Postsecondary nondegree award
51-4121	Welders, Cutters, Solderers, and Brazers	12,146	$21.51	High school diploma or equivalent
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	1,988	$18.32	High school diploma or equivalent
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	19,584	$18.22	High school diploma or equivalent
51-9124	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	3,388	$20.31	High school diploma or equivalent
51-9161	Computer Numerically Controlled Tool Operators	2,184	$21.85	High school diploma or equivalent
51-9197	Tire Builders	1,354	$24.09	High school diploma or equivalent
51-9199	Production Workers, All Other	17,941	$16.40	High school diploma or equivalent
TRANSPORT AND MATERIAL MOVING OCCUPATIONS				
53-7051	Industrial Truck and Tractor Operators	20,807	$17.43	No formal educational credential
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	91,498	$17.29	No formal educational credential

Source: Lightcast (April 2024)

REFERENCES

1 Tennessee Department of Economic and Community Development (April 2024)
2 Lightcast (April 2024)
3 Ibid.
4 US Census Bureau, “USA Trade Online,” (April 2024)
5 Ibid.
6 Ibid.