

# Socioeconomic Profile of the Henderson Area and Potential Target Industries

October 2020

# Contents

<b>Executive Summary</b> .....	i
<b>Introduction</b> .....	1
<b>Socioeconomic Profile</b> .....	3
Population .....	3
Income Levels .....	7
Education.....	9
Economy .....	13
Workforce .....	15
Implications for Economic Development.....	18
<b>Target Industry Analysis</b> .....	20
Fast-Growing Industries .....	21
Texas .....	22
Upper East Texas Region .....	24
East Texas Region.....	26
Henderson Linkages.....	27
Target Industry Overview .....	28
Specific Target Industry Sectors.....	28
Multiplier Analysis .....	51
<b>Conclusion</b> .....	52
<b>Appendix A: Methods Used</b> .....	53
Target Industry Identification Process .....	53
US Multi-Regional Econometric Model.....	56
US Multi-Regional Impact Assessment System .....	62
US Multi-Regional Industry-Occupation System .....	66

## Executive Summary

- Targeted, **proactive economic development efforts are crucial to success** in the increasingly competitive environment for desirable corporate activity. Smaller population centers face additional challenges, and an efficient and targeted approach is essential to maximizing success.
- The current socioeconomic status of the Henderson area can be used to help **identify potential strengths to build from and challenges which could be targeted for improvement.**
  - As is typical in most smaller rural population centers across Texas and elsewhere, the population of the Henderson area has been growing significantly slower than the state. In addition, it is more concentrated in older age ranges.
  - There is also a significant difference between the median household income in Henderson as compared to the state. The median household income in the city is \$43,438, more than \$16,000 less than the statewide level. However, the cost of housing is much lower in the area than on average across the state.
- **Target industry analysis involves a systematic and realistic evaluation to develop a list of industries which are the most viable for recruitment**, allowing for enhanced efficiency and rate of return associated with investments in economic development. The Perryman Group performed a **local and regional comparative analysis** to determine industries where the area may have a competitive advantage.
- The Perryman Group's analysis of potential target industries identified the following types of industries as candidates for recruitment which could offer higher probabilities of success.
  - Renewable Energy
  - Agriculture/Food Processing (including potential for tourism opportunities related to artisanal foods, wine, or spirits; note that, given the large number of relatively small communities in the region, other tourism opportunities could potentially

arise from venues for athletic tournaments of other similar events).

- Wood Products Manufacturing and Stone/Clay/Glass
  - Transportation and the Potential for a Multi-Modal Logistics Hub
  - Warehousing
  - Other Spin-off from Regional Industries (including Plastics, Fabricated Metals, Machinery, Electrical Equipment, and Biomedical)
- The Henderson area offers many advantages for certain types of firms, and a development plan which builds on these advantages can increase opportunities for area residents and businesses in the decades to come.

# Introduction

Targeted, proactive economic development efforts are crucial to success in the increasingly competitive environment for desirable corporate activity. As the economy recovers from the COVID-19 pandemic, proactive efforts to secure locations and expansion (as well

Targeted, proactive economic development efforts are crucial to success in the increasingly competitive environment for desirable corporate activity.

as retain existing businesses) will be even more necessary as communities across the nation attempt to revive business activity. Smaller population centers face additional challenges, and an efficient and targeted approach is essential to maximizing success.

Given the reality that the process is driven by comparative advantage, areas without meaningful programs will be decidedly handicapped in their efforts. The challenge for economic development professionals and leaders thus becomes one of assuring that programs are effectively structured, properly administered, and reflective of local priorities.

Proactive economic development efforts have been and will continue to be crucial to economic gains. For example, The Perryman Group recently studied the statewide benefits of projects facilitated by the sales tax for economic development for the Texas Economic Development Council (TEDC) and found that over 20% of the net new jobs generated in Texas over the past 30 years have involved proactive economic development efforts funded by the economic development sales tax.<sup>1</sup>

Given the intense level of competition that is likely to surface as areas seek to emerge and rebuild in the aftermath of the coronavirus pandemic, they will become even more important in the future. The

---

<sup>1</sup> “Three Decades of Growth and Prosperity: The Impact of Projects Facilitated by the Texas Sales Tax for Economic Development,” The Perryman Group, June 2020, hosted at <https://www.perrymangroup.com/media/uploads/report/perryman-three-decades-of-growth-and-prosperity-06-26-20.pdf>.

more targeted such efforts can be, the higher the return on taxpayer investment.

This report provides a socioeconomic profile of the Henderson area as well as a list of potential target industries. These components can be utilized in strategic planning to enhance success.

# Socioeconomic Profile

Henderson, Texas is the county seat of Rusk County located in northeast Texas. It is roughly 20 miles south of Interstate 20 and

The latest resident population estimates from the US Census Bureau show that Henderson had a population of 13,154 in 2019.

approximately 50 miles west of the Texas-Louisiana border. The city is a major crossroads in northeast Texas and contains the intersection of US Route 259, US Route 79, Texas State Highway 64, and Texas State Highway 43.

Rusk County is a part of the Longview Metropolitan Statistical Area (MSA) along with Gregg and Upshur counties. The county is also located in the East Texas Workforce Development Area (WDA).

## Population

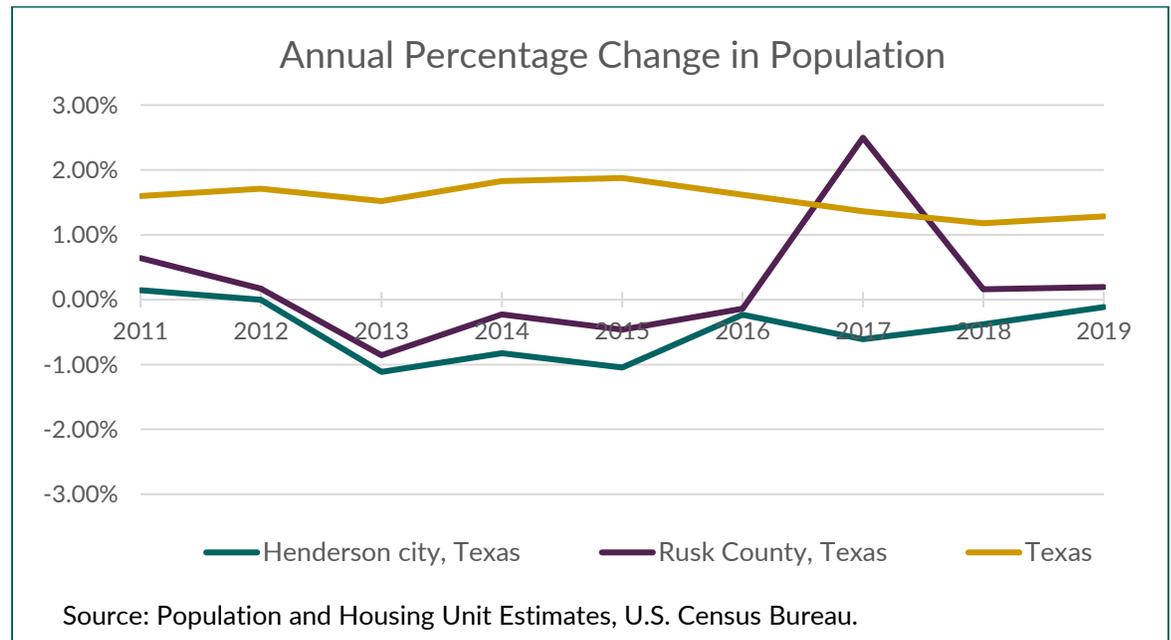
The population of the Henderson area has been growing significantly slower than the state. In addition, it is more concentrated in older age ranges. These patterns are typical of smaller rural areas in Texas.

The latest resident population estimates from the US Census Bureau show that Henderson had a population of 13,154 in 2019.<sup>2</sup> The city's population has decreased by about 4.1% since 2010, when the population was 13,717. Though the population increased slightly in 2011 and remained steady in 2012, it has fallen every year since. The population from Rusk County has fluctuated more during the past decade and overall increased by nearly 1,100 people from 2010 to 2019, to reach a population of 54,406.<sup>3</sup> Though the county population was mostly decreasing towards the beginning of the decade, an increase in growth in 2017 and continued growth since then, albeit at a slower pace, has contributed to the overall growth in the county during the 2010s. (Note that for less-populated areas such as Rusk County,

<sup>2</sup> City and Town Population Totals: 2010-2019, Population and Housing Unit Estimates, Vintage 2019, U.S. Census Bureau.

<sup>3</sup> County Population Totals: 2010-2019, Population and Housing Unit Estimates, Vintage 2019, U.S. Census Bureau.

population growth estimates can vary notably year to year due to the estimation techniques utilized.)



Since 2010, over 60% of the population change in the county can be attributed to natural increase (births minus deaths).<sup>4</sup> The county has also had a positive net migration over the nine-year period, which

**The population in Henderson and Rusk County is older than Texas as a whole.**

accounted for close to 40% of the population growth.<sup>5</sup>

Overall, the population in Henderson and Rusk County is older than Texas as a whole,

though to a much greater extent for the county.<sup>6</sup> Henderson has a larger proportion of those 75 and older than the state, though has similar proportions of those 65 and younger (except for the 10 to 14 years age bracket).<sup>7</sup> The median age for the city is 34.9 years old, just

<sup>4</sup> Estimates of the Components of Resident Population Change for Counties: April 1, 2010 to July 1, 2019, Population and Housing Unit Estimates, Vintage 2019, U.S. Census Bureau.

<sup>5</sup> Estimates of the Components of Resident Population Change for Counties: April 1, 2010 to July 1, 2019, Population and Housing Unit Estimates, Vintage 2019, U.S. Census Bureau.

<sup>6</sup> American Community Survey, 5-Year Estimates, S0101, 2018, U.S. Census Bureau.

<sup>7</sup> American Community Survey, 5-Year Estimates, S0101, 2018, U.S. Census Bureau.

slightly above the 34.4 in Texas.<sup>8</sup> Although the median age is not too dissimilar from the state's, the age dependency ratios indicate the different distribution across age groups. The child dependency ratio (defined as the proportion of children under the age of 18 to every 100 individuals in working population aged 18 to 64) for Henderson is 38.4, lower than the 42.3 for Texas.<sup>9</sup> The old-age dependency ratio, the number of individuals aged 65 and over to every 100 of the working population in an area, is 23.2 compared to Texas' 19.3.<sup>10</sup>

Rusk County has a much older population than either the state or Henderson alone. The median age is 38.5 and the proportion of older adults (especially aged 55 to 59 years and 65 to 74 years) is higher than the state while the proportion of individuals under the age of 35 is also lower across all age brackets.<sup>11</sup> Predictably, the child dependency ratio is lower than the city and state (37.4 compared to 38.4 in Henderson and 42.3 in Texas) and the old-age dependency ratio is much higher (26.3 for Rusk County compared to 23.2 in Henderson and 19.3 in Texas).<sup>12</sup> This data shows that there are proportionally more older individuals living in the county outside of Henderson city limits, further increasing the median age and old-age dependency ratio. Again, these variations are frequently observed in rural areas.

---

<sup>8</sup> American Community Survey, 5-Year Estimates, S0101, 2018, U.S. Census Bureau.

<sup>9</sup> American Community Survey, 5-Year Estimates, S0101, 2018, U.S. Census Bureau.

<sup>10</sup> American Community Survey, 5-Year Estimates, S0101, 2018, U.S. Census Bureau.

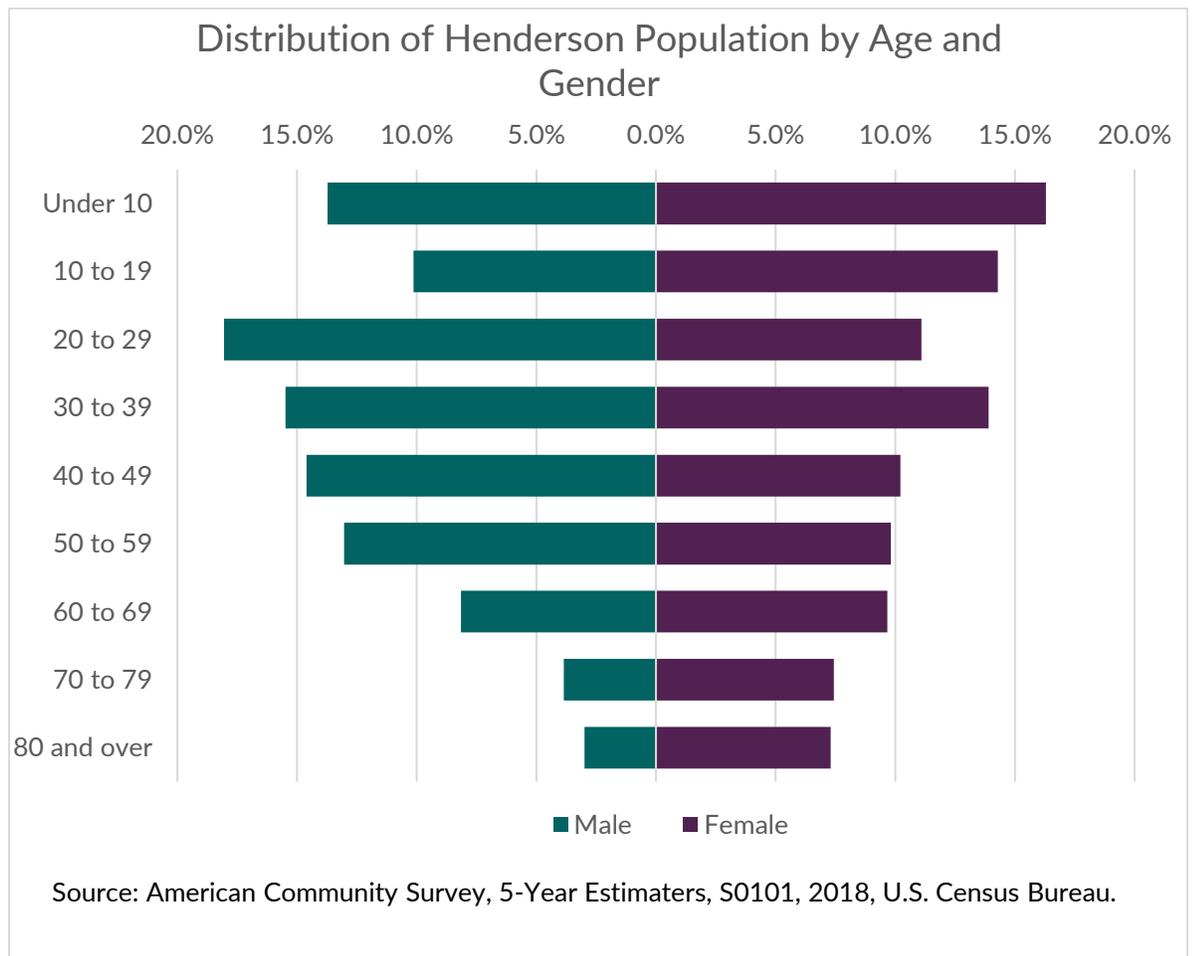
<sup>11</sup> American Community Survey, 5-Year Estimates, S0101, 2018, U.S. Census Bureau.

<sup>12</sup> American Community Survey, 5-Year Estimates, S0101, 2018, U.S. Census Bureau.

<b>Population Distribution by Age</b>			
Results in 2018 for the Henderson Area			
<b>Age Group</b>	<b>Henderson</b>	<b>Rusk County</b>	<b>Texas</b>
Under 5 years	7.2%	5.9%	7.2%
5 to 9 years	7.7%	6.9%	7.3%
10 to 14 years	4.7%	6.1%	7.4%
15 to 19 years	7.5%	6.7%	7.1%
20 to 24 years	7.9%	6.1%	7.2%
25 to 34 years	15.3%	13.3%	14.7%
35 to 44 years	13.1%	13.0%	13.5%
45 to 54 years	11.3%	13.0%	12.6%
55 to 59 years	5.7%	7.0%	5.9%
60 to 64 years	5.2%	5.9%	5.2%
65 to 74 years	7.1%	9.1%	7.2%
75 to 84 years	4.3%	5.2%	3.5%
85 years and over	2.9%	1.8%	1.3%
Median age (years)	34.9	38.5	34.4

Source: US Census Bureau, American Community Survey, 5-Year Estimates, DP05, 2018.

Age distribution varies notably by gender.



Overall, the City of Henderson is more diverse than the county and the state, with a larger proportion of Black individuals living in the city. The city also has a higher proportion of Hispanic individuals as compared to the county, though less than the state as a whole.

Population Distribution by Race/Ethnicity				
Results in 2018 for the Henderson Area				
Race/Ethnicity	Henderson	Rusk County	Texas	
White	70.2%	78.6%	74.3%	
Black	22.7%	17.2%	12.1%	
Asian	1.2%	0.6%	4.7%	
Other	5.9%	3.6%	8.9%	
Hispanic	22.0%	16.5%	39.2%	

**Note:** Other includes those who identified as more than one race; Hispanic includes those who identified as such, regardless of race.

**Source:** US Census Bureau, American Community Survey, 5-Year Estimates, DP05, 2018.

## Income Levels

As shown in the table below, there is a significant difference between the median household income in Henderson as compared to the state.<sup>13</sup>

The median household income in the city is \$43,438, more than \$16,000 less than the statewide level.<sup>14</sup> Compared to the state, Henderson has a larger proportion of households in the lower income brackets and fewer households with incomes of

**The median household income in Henderson is \$43,438, more than \$16,000 less than the statewide level.**

\$100,000 or more.<sup>15</sup> The county's median household income is closer to the state level, but in general has a larger proportion of earners in the middle income brackets (\$10,000 to \$100,000) compared to the state.<sup>16</sup>

<sup>13</sup> American Community Survey, 5-Year Estimates, S2503, 2018, U.S. Census Bureau.

<sup>14</sup> American Community Survey, 5-Year Estimates, S2503, 2018, U.S. Census Bureau.

<sup>15</sup> American Community Survey, 5-Year Estimates, S2503, 2018, U.S. Census Bureau.

<sup>16</sup> American Community Survey, 5-Year Estimates, S2503, 2018, U.S. Census Bureau.

Household Distribution by Income			
Results in 2018 for the Henderson Area Compared to the State			
Income Bracket	Henderson	Rusk County	Texas
Less than \$5,000	5.7%	3.4%	3.2%
\$5,000 to \$9,999	4.0%	3.2%	3.2%
\$10,000 to \$14,999	5.7%	5.1%	4.4%
\$15,000 to \$19,999	6.9%	5.6%	4.5%
\$20,000 to \$24,999	5.0%	5.4%	4.8%
\$25,000 to \$34,999	12.4%	10.1%	9.6%
\$35,000 to \$49,999	15.5%	15.3%	12.8%
\$50,000 to \$74,999	15.6%	18.4%	17.7%
\$75,000 to \$99,999	12.3%	12.6%	12.2%
\$100,000 to \$149,999	10.4%	12.6%	14.6%
\$150,000 or more	6.6%	8.3%	13.0%
Median Household Income	\$43,438	\$52,329	\$59,570

Source: US Census Bureau, American Community Survey, 5-Year Estimates, S2503, 2018.

However, looking at the cost of housing as an indicator of the cost of living, costs are much lower in the area than on average across the

**Henderson's median housing costs are lower than the statewide level.**

state. The median monthly housing costs are \$721 in Henderson and \$702 in Rusk County, compared to \$1,031 in Texas.<sup>17</sup> In Henderson, more

households have monthly housing costs in the \$300 to \$1,000 range than in the state as a whole. The county has nearly double the proportion of those paying \$300 dollars or less than either the city or Texas, as well as a larger proportion of those paying no cash rent.<sup>18</sup>

<sup>17</sup> American Community Survey, 5-Year Estimates, S2503, 2018, U.S. Census Bureau.

<sup>18</sup> American Community Survey, 5-Year Estimates, S2503, 2018, U.S. Census Bureau.

<b>Distribution of Housing Costs</b>			
Results in 2018 for the Henderson Area Compared to the State			
Monthly Housing Costs	Henderson	Rusk County	Texas
Less than \$300	6.1%	12.3%	6.0%
\$300 to \$499	19.3%	18.8%	10.0%
\$500 to \$799	31.6%	24.3%	17.9%
\$800 to \$999	15.4%	12.9%	13.4%
\$1,000 to \$1,499	16.7%	15.3%	25.0%
\$1,500 to \$1,999	4.8%	7.3%	13.2%
\$2,000 to \$2,499	1.9%	3.0%	5.8%
\$2,500 to \$2,999	0.2%	1.0%	3.0%
\$3,000 or more	0.9%	1.0%	3.8%
No cash rent	3.0%	4.1%	1.9%
Median Monthly Housing Costs	\$721	\$702	\$1,031

Source: US Census Bureau, American Community Survey, 5-Year Estimates, S2503, 2018.

## Education

The overall level of educational attainment in the Henderson area is lower than in the state as a whole. Among the population aged 25 or over, there is a higher proportion of those who have only reached or completed high school and a smaller proportion of those who have a Bachelor's degree or higher.<sup>19</sup>

<b>Educational Attainment</b>			
Results by City of Henderson, Rusk County, and Texas			
Highest Level Obtained	Henderson	Rusk County	Texas
Less than 9th Grade	8.5%	7.4%	8.5%
9th to 12th Grade, no diploma	15.8%	12.4%	8.3%
High school graduate	30.4%	31.5%	25.0%
Some college, no degree	23.0%	25.8%	21.8%
Associate's degree	7.7%	8.3%	7.1%
Bachelor's degree	9.5%	9.8%	19.1%
Graduate or professional degree	5.2%	4.7%	10.2%
High school graduate or higher	75.7%	80.1%	83.2%
Bachelor's degree or higher	14.7%	14.5%	29.3%

Notes: Population 25 years and over

Source: US Census Bureau, American Community Survey, 5-Year Estimates, S1501, 2018.

<sup>19</sup> American Community Survey, 5-Year Estimates, S1501, 2018, U.S. Census Bureau.

The overall level of educational attainment in the Henderson area is lower than in the state as a whole.

The high school graduation rate is lowest among the population aged 35 to 44 years, though the rates have increased for the 25 to 34 year-old age bracket.<sup>20</sup> Most recently, however, in the Henderson Independent School District (ISD), 95.4% of the Class of 2018 graduated in four years, compared to only 90% across the state.<sup>21</sup> It

can be expected for the high school graduation rate to continue at high levels. Thus, to the extent that the area can retain younger residents, the overall educational levels should increase over time.

<b>High School Graduation Rates</b>			
Results by City of Henderson, Rusk County, and Texas			
<b>Population Age Bracket</b>	<b>Henderson</b>	<b>Rusk County</b>	<b>Texas</b>
18 to 24 years	74.3%	77.7%	84.9%
25 to 34 years	77.9%	79.1%	87.6%
35 to 44 years	66.4%	73.2%	83.3%
45 to 64 years	80.4%	82.8%	82.8%
65 years and over	74.7%	82.4%	78.5%

Source: US Census Bureau, American Community Survey, 5-Year Estimates, S1501, 2018.

In addition to the high school graduation rates being below the state level across all age groups, the college readiness scores are also lower. Based on meeting or exceeding criteria on the Texas Success Initiative Assessment (TSIA), the SAT, or the ACT tests, only 17.1% of the Class of 2018 were considered college ready in both reading and math while

<sup>20</sup> American Community Survey, 5-Year Estimates, S1501, 2018, U.S. Census Bureau.

<sup>21</sup> Henderson ISD, Texas Tribune, Public School Explorer, (n.d.), <https://schools.texastribune.org/districts/henderson-isd/>.

42.1% of the state was considered college ready in both fields.<sup>22</sup> Separately, 27.2% of the Class of 2018 was considered ready in reading (versus 58.2% statewide) and 20.2% was considered ready in math (versus 46.0% statewide).<sup>23</sup>

The Henderson area's college readiness scores are also lower.

Only 3.6% of students in 11<sup>th</sup> and 12<sup>th</sup> grade took at least one Advanced Placement (AP) or International Baccalaureate

(IB) exam in the 2017-2018 school year, compared to 25.8% in Texas.<sup>24</sup> Furthermore, only 23.5% of test takers passed at least one of those exams, while 50.7% of students passed the exams across the state.<sup>25</sup> Dual credit classes are also available at Henderson High School. While some of the differences between the local area and the state may represent variances in classes offered in the Henderson area and students opting for dual credit instead of AP, a common phenomenon in rural districts, if fewer students are taking advanced coursework, there could be cause for concern.

Henderson ISD has three primary schools (divided between Preschool and Kindergarten, 1<sup>st</sup> to 3<sup>rd</sup> grades, and 4<sup>th</sup> and 5<sup>th</sup> grades), one middle school, and one high school, with a total district enrollment of 3,415 in the 2018-2019 school year.<sup>26</sup> According to the latest ratings from the Texas Education Agency, the district received an **overall rating of A for 2019**, with, a B for student achievement, a B for academic growth, an A for school progress, and an A for closing the gaps.<sup>27</sup> However, the ratings for the individual schools show room for improvement. The primary school, elementary schools, and the high school all have an accountability rating of B and the middle school has a rating of C.

<sup>22</sup> Henderson ISD, Texas Tribune, Public School Explorer, (n.d.), <https://schools.texastribune.org/districts/henderson-isd/>.

<sup>23</sup> Henderson ISD, Texas Tribune, Public School Explorer, (n.d.), <https://schools.texastribune.org/districts/henderson-isd/>.

<sup>24</sup> Henderson ISD, Texas Tribune, Public School Explorer, (n.d.), <https://schools.texastribune.org/districts/henderson-isd/>.

<sup>25</sup> Henderson ISD, Texas Tribune, Public School Explorer, (n.d.), <https://schools.texastribune.org/districts/henderson-isd/>.

<sup>26</sup> Henderson ISD, Texas Tribune, Public School Explorer, (n.d.), <https://schools.texastribune.org/districts/henderson-isd/>.

<sup>27</sup> Texas Education Agency, 2019 A-F Accountability Listing, <https://rptsvr1.tea.texas.gov/perfreport/account/2019/srch.html>.

Rusk County, in addition to Henderson ISD, also contains all or portions of the Carlisle, Cushing, Garrison, Kilgore, Laneville, Leveretts Chapel, Mount Enterprise, Overton, Rusk, Tatum, and West Rusk Independent School Districts.<sup>28</sup>

There are multiple colleges and universities in the vicinity of Henderson, Texas, providing numerous opportunities for post-secondary education.<sup>29</sup> The nearby institutions include:

- Angelina College in Lufkin, Texas;
- East Texas Baptist University in Marshall, Texas;
- Jacksonville College in Jacksonville, Texas;
- Jarvis Christian College in Hawkins, Texas;
- Kilgore College in Kilgore, Texas;
- LeTourneau University in Longview, Texas;
- Panola College in Carthage, Texas;
- Stephen F. Austin State University in Nacogdoches, Texas;
- Texas College in Tyler, Texas;
- Texas State Technical College, Marshall;
- Trinity Valley Community College in Athens and Palestine, Texas;
- Tyler Junior College in Tyler, Texas;
- University of Texas at Tyler in Tyler, Texas;
- University of Texas Health Science Center in Tyler, Texas;  
and
- Wiley College in Marshall, Texas.

---

<sup>28</sup> Public School Districts, Rusk County, Texas, March 2, 2020, <http://www.ruskcountytexas.us/PublicSchools/zzPublicSchools.htm>.

<sup>29</sup> East Texas Colleges and Universities, East-Texas.com, (n.d.), <https://www.east-texas.com/east-texas-colleges-universities.htm>.

Of those living in Henderson with a Bachelor's Degree, the most common field is education, representing 31.9% of the total.

Of those living in Henderson with a Bachelor's Degree, the most common field is education, representing 31.9% of the total.

common field is education, representing 31.9% of the total. The next most frequent field is business (24.3%), followed by science and engineering (22.4%). For the state, Bachelor's Degrees are concentrated in

science and engineering (34.8%).<sup>30</sup> This information indicates that the workforce in Henderson is likely to have a different composition of skills than is typical for other areas of the state, particularly the large urban centers.

<b>Bachelor's Degrees Attained</b>			
Results by City of Henderson, Rusk County, and Texas			
<b>Field of Bachelor's Degree for First Major</b>	<b>Henderson</b>	<b>Rusk County</b>	<b>Texas</b>
Science and Engineering	22.4%	27.6%	34.8%
Science and Engineering Related	10.2%	11.2%	9.0%
Business	24.3%	18.5%	23.3%
Education	31.9%	27.3%	12.5%
Arts, Humanities and Others	11.3%	15.4%	20.4%
Notes: Population 25 years and over with a Bachelor's Degree			
Source: US Census Bureau, American Community Survey, 5-Year Estimates, S1502, 2018.			

## Economy

The largest industry for employment in Rusk County is government, followed by mining, which has declined significantly in recent years, and

<sup>30</sup> American Community Survey, 5-Year Estimates, S1502, 2018, U.S. Census Bureau.

health and social services.<sup>31</sup> The county has a larger proportion of the workforce in agriculture and mining than the state.<sup>32</sup> Overall, the area has a much heavier emphasis in goods-producing industries (32.7% of employment) versus the state (17.2% of employment).<sup>33</sup>

According to data from the US Bureau of Labor Statistics, the Rusk County unemployment rate was 8.3% in September, after improving to 6.8% in August after reaching 10.5% in May.<sup>34</sup> Total employment for the county fell to 18,370 in April and stood at 20,644 in September. An estimated 1,880 persons in the county were unemployed. As with many parts of the nation, the economy is struggling as federal stimulus funds have run out and the pandemic continues. The recent volatility in the employment numbers is also a consequence of the disruptions stemming from the coronavirus.

---

<sup>31</sup> Bureau of Economic Analysis, Total Full-Time and Part-Time Employment by NAICS Industry, 2018.

<sup>32</sup> Bureau of Economic Analysis, Total Full-Time and Part-Time Employment by NAICS Industry, 2018.

<sup>33</sup> Bureau of Economic Analysis, Total Full-Time and Part-Time Employment by NAICS Industry, 2018.

<sup>34</sup> US Bureau of Labor Statistics, Local Area Unemployment Statistics, Rusk County Texas.

<b>Employment by Industry</b>		
Results by Rusk County and Texas		
Industries	Rusk County	Texas
Agriculture	7.6%	1.9%
Mining	9.0%	2.7%
Utilities	1.3%	0.3%
Construction	7.4%	6.8%
Manufacturing	7.4%	5.5%
Wholesale trade	2.2%	3.6%
Retail trade	8.3%	9.4%
Logistics	3.5%	5.1%
Information	0.8%	1.5%
Finance and insurance	5.2%	5.9%
Real estate and rental and leasing	2.4%	4.5%
Professional Services	3.5%	6.9%
Management Services	0.2%	1.2%
Administrative Services	6.7%	6.7%
Educational Services	0.7%	1.6%
Health and Social Services	8.9%	9.7%
Amusement and Recreation Services	0.7%	1.7%
Accommodation and Food Services	5.3%	7.6%
Other Services	6.7%	5.7%
Government	12.0%	11.8%

Source: Bureau of Economic Analysis, Total Full-Time and Part-Time Employment by NAICS Industry, 2018.

## Workforce

Although the latest available workforce data at the city level is somewhat dated (2018), particularly given the pandemic, it nonetheless provides an indication of typical patterns. The 2018 unemployment rate in Henderson was 4.8% in 2018, below Texas at 5.4% and Rusk County at 6.2%.<sup>35</sup> Note that the US Census Bureau only estimates unemployment for Henderson on a five-year basis, and comparable five-year estimates for Rusk County and Texas are provided. One-year estimates for Texas and Rusk County are available from the US Bureau of Labor Statistics and were 3.8% and 4.0%, respectively.

<sup>35</sup> American Community Survey, 5-Year Estimates, S2301, 2018, U.S. Census Bureau.

The labor force participation rate was particularly low for the city, even compared to the county. In Henderson, only 46.0% of the population 16 and over was in the labor force, compared to 52.2% in Rusk County and 64.6% in Texas.<sup>36</sup> (Note that for smaller population centers such as Henderson, data variations can occur due to estimation techniques. While such estimates can be useful, it is important to understand their limitations.) While a portion of the difference can be explained by the older age of the population in the city as compared to the state, the

**The labor force participation rate is much lower in Henderson than the state across all age brackets.**

city's labor force participation rate is more than 20 percentage points lower than that of the state in prime working age groups (under 65).<sup>37</sup> The labor

force participation rate is much lower in Henderson across all age brackets and is particularly low in younger age brackets (16 to 24 and 30 to 34 years) and among men living in the city.<sup>38</sup> The female participation rate is closer to that of the county and state, though for Texas the female labor force participation rate is lower than that of males.<sup>39</sup>

---

<sup>36</sup> American Community Survey, 5-Year Estimates, S2301, 2018, U.S. Census Bureau.

<sup>37</sup> American Community Survey, 5-Year Estimates, S2301, 2018, U.S. Census Bureau.

<sup>38</sup> American Community Survey, 5-Year Estimates, S2301, 2018, U.S. Census Bureau.

<sup>39</sup> American Community Survey, 5-Year Estimates, S2301, 2018, U.S. Census Bureau.

<b>Labor Force Participation Rate</b>			
Results in 2018 for the Henderson Area			
<b>Population</b>	<b>Henderson</b>	<b>Rusk County</b>	<b>Texas</b>
16 and over	46.0%	52.2%	64.6%
16 to 19 years	42.5%	51.8%	34.7%
20 to 24 years	51.2%	61.8%	73.1%
25 to 29 years	59.1%	64.3%	80.8%
30 to 34 years	47.4%	57.3%	80.6%
35 to 44 years	59.5%	66.3%	81.0%
45 to 54 years	53.2%	62.7%	79.5%
55 to 59 years	60.4%	65.8%	71.6%
60 to 64 years	47.8%	50.4%	57.0%
20 to 64 years	54.4%	62.1%	76.6%
Male	48.3%	62.2%	83.6%
Female	63.1%	62.0%	69.7%

**Source:** US Census Bureau, American Community Survey, 5-Year Estimates, S2301, 2018.

Predictably, the labor force participation rate is lower for those living below the poverty level and those with only a high school degree or less (which are also two indicators that are correlated with each other).<sup>40</sup> As there is a larger proportion of the population that is a high school graduate or less in the Henderson area compared to the state,<sup>41</sup> it is likely that the labor force participation rate is lower at least partially for this reason.

<sup>40</sup> American Community Survey, 5-Year Estimates, S2301 and S1701, 2018, U.S. Census Bureau.

<sup>41</sup> American Community Survey, 5-Year Estimates, S1501, 2018, U.S. Census Bureau.

Labor Force Participation Rate			
Results in 2018 for the Henderson Area			
Population	Henderson	Rusk County	Texas
16 and over	46.0%	52.2%	64.6%
Below poverty level	42.6%	39.9%	51.6%
At or above poverty level	78.5%	75.9%	82.0%
Population 25 to 64 years	54.9%	62.2%	77.1%
Less than high school graduate	47.3%	47.9%	64.5%
High school graduate	41.3%	57.3%	72.2%
Some college or associate's degree	62.0%	69.2%	79.1%
Bachelor's degree or higher	78.8%	76.6%	85.7%

Source: US Census Bureau, American Community Survey, 5-Year Estimates, S2301, 2018.

## Implications for Economic Development

It is beyond the scope of this study to develop a complete and comprehensive economic development plan, but one issue is worthy of mention. In formulating a strategic plan, the current socioeconomic status of the Henderson area can be used to help identify potential strengths to build from and challenges which could be targeted for improvement.

**In formulating a strategic plan, the current socioeconomic status of the Henderson area can be used to help identify potential strengths to build from and challenges which could be targeted for improvement.**

For example, the education system could be prioritized in community-wide efforts to reduce the dropout rate, encourage students to take challenging courses in high school to the extent possible, and improve understanding among students of opportunities available with higher

education. In addition, there is an opportunity to reach out to those potential workers who are disengaged from the labor force, especially those who are male, living below the poverty level, and have a high school degree or less. Assisting current and potential firms to partner with regional educational institutions to meet specific training needs is also a viable option.

Local priorities and resources should clearly drive potential strategic plans and actions, but from an economic development perspective, improving educational attainment is an important goal, one that will only be enhanced in the aftermath of the pandemic



## Target Industry Analysis

Target industry analysis involves a systematic and realistic evaluation to develop a list of industries which are the most viable for recruitment, allowing for enhanced efficiency and rate of return associated with

Target industry analysis involves a systematic and realistic evaluation to develop a list of industries which are the most viable for recruitment, allowing for enhanced efficiency and rate of return associated with investments in economic development.

investments in economic development. The analysis begins by identifying higher growth industries. While some relocations may occur, there is a significantly lower likelihood of success in stagnant or declining sectors. The list is then narrowed to include only industries which are a good fit for the community.<sup>42</sup>

In order to successfully recruit a new location or expansion, the community must meet the essential needs of firms in the industry. These needs often include workforce, location, proximity to suppliers/customers, raw materials, and infrastructure. The most successful efforts also involve communities building from strengths such as comparative advantages and existing industries.

It is important that target industry recruitment is focused on “primary” jobs and investments, meaning that they are supported by resources from other areas. Examples of industries providing such jobs include those manufacturing products sold in national or global market or providing services outside the local area. Tourism-related investments can also be effective if it is possible for an area to become a significant destination. In general, companies in industries that primarily serve the local area such as retail outlets, restaurants, and personal services

---

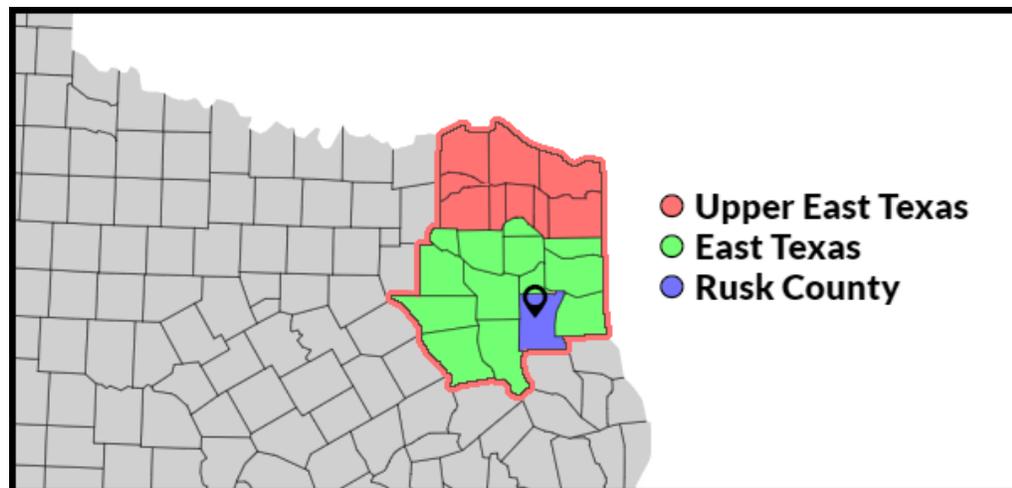
<sup>42</sup> For additional discussion of this topic and further information related to proactive economic development efforts, see The Perryman Group’s October 2019 report “The Market for Prosperity: What Every Community Needs to Know to Optimize Economic Development,” hosted at <https://www.perrymangroup.com/media/uploads/reports/perryman-the-market-for-prosperity-10-2019.pdf>.

establishments should not be targets, with destination retailers that expand the trade area being a notable exception.

## Fast-Growing Industries

As noted, one criteria for a potential target industry is future growth expectations. The Perryman Group has been producing forecasts for the state and the East Texas Region for decades. The latest projections from the firm's US Multi-Regional Econometric Model were used to identify industries expected to grow significantly over the next several decades. The outlook for key primary industries (manufacturing and logistics) are described below.

Projections are included for Texas as well as the East Texas and Upper East Texas Regions described in the map below. The East Texas Region definition is based on the Council of Governments convention, while the Upper East Texas Region (which includes counties in the East Texas Region as well as the additional area highlighted in red) is defined by the Texas Comptroller Planning Region conventions.



Note that the following are baseline projections which assume continuation of proactive economic development efforts. They could be positively affected by successful recruitment efforts, and ultimate growth could be higher. Similarly, without viable location and retention strategies, growth could be curtailed.

## Texas

The fastest-growing manufacturing industries through 2045 for Texas are projected to be machinery, transportation equipment, chemicals, and fabricated metal products as described in the following table.

<b>Fastest Growing Manufacturing Industries: Texas</b>		
	<b>Texas Job Gains through 2045</b>	<b>Percent of Total Industry Group Increase</b>
<b>Total Manufacturing</b>	<b>233,600</b>	
Machinery	50,200	21%
Transportation Equipment	41,900	18%
Chemicals	28,800	12%
Fabricated Metal Products	27,900	12%
Food	21,300	9%
Plastics and Rubber Products	12,800	5%
Computer and Electronic Products	7,500	3%
Wood Products	7,200	3%
Electrical Equipment, Appliances, and Components	7,200	3%
Petroleum and Coal Products	7,100	3%
Primary Metals	5,800	2%
Nonmetallic Mineral Products	5,400	2%
Beverage and Tobacco Products	5,200	2%
Printing and Related Support Activities	5,000	2%
Furniture and Related Products	3,700	2%
Source: US Multi-Regional Econometric Model, The Perryman Group		

The transportation and warehousing industry group is projected to add 280,600 jobs in Texas through 2045.

## Fastest Growing Transportation and Warehousing Industries: Texas

	Texas Job Gains through 2045	Percent of Total Industry Group Increase
<b>Transportation and Warehousing</b>	<b>280,600</b>	
Truck Transportation	69,900	25%
Warehousing and Storage	59,300	21%
Couriers and Messengers	42,100	15%
Support Activities for Transportation	40,500	14%
Air Transportation	40,100	14%
Pipeline Transportation	9,800	4%
Rail Transportation	8,700	3%
Transit and Ground Passenger Transportation	7,700	3%
Source: US Multi-Regional Econometric Model, The Perryman Group		

## Upper East Texas Region

The manufacturing industry group is projected to add almost 11,000 jobs in the Upper East Texas Region through 2045. Gains are forecast to be concentrated in machinery, transportation equipment, food, fabricated metal products, and chemicals.

<b>Fastest Growing Manufacturing Industries: Upper East Texas Region</b>		
	<b>Upper East Texas Region Job Gains through 2045</b>	<b>Percent of Total Industry Group Increase</b>
<b>Total Manufacturing</b>	<b>10,980</b>	
Machinery	2,240	20%
Transportation Equipment	2,190	20%
Food	1,840	17%
Fabricated Metal Products	1,290	12%
Chemicals	1,150	10%
Wood Products	810	7%
Primary Metals	450	4%
Plastics and Rubber Products	430	4%
Electrical Equipment, Appliances, and Components	230	2%
Furniture and Related Products	200	2%
Beverage and Tobacco Products	180	2%
Petroleum and Coal Products	180	2%
Source: US Multi-Regional Econometric Model, The Perryman Group		

Over 8,700 jobs are projected to be gained in Upper East Texas Regional transportation and warehousing industries.

## Fastest Growing Transportation and Warehousing Industries: Upper East Texas

	Upper East Texas Region Job Gains through 2045	Percent of Total Industry Group Increase
<b>Transportation and Warehousing</b>	<b>8,730</b>	
Warehousing and Storage	3,540	41%
Truck Transportation	2,530	29%
Support Activities for Transportation	1,100	13%
Couriers and Messengers	710	8%
Rail Transportation	450	5%
Pipeline Transportation	230	3%
Source: US Multi-Regional Econometric Model, The Perryman Group		

## East Texas Region

For the East Texas Region, 6,700 net new manufacturing jobs are forecast to be added through 2045. Machinery, transportation equipment, and food manufacturing industries are likely to experience the largest gains.

<b>Fastest Growing Manufacturing Industries: East Texas</b>		
	<b>East Texas Region Job Gains through 2045</b>	<b>Percent of Total Industry Group Increase</b>
<b>Total Manufacturing</b>	<b>6,700</b>	
Machinery	1,620	24%
Transportation Equipment	940	14%
Food	840	13%
Fabricated Metal Products	750	11%
Chemicals	700	10%
Wood Products	520	8%
Primary Metals	380	6%
Plastics and Rubber Products	260	4%
Electrical Equipment, Appliances, and Components	190	3%
Furniture and Related Products	150	2%
Beverage and Tobacco Products	140	2%
Petroleum and Coal Products	130	2%
Source: US Multi-Regional Econometric Model, The Perryman Group		

Almost 7,000 transportation and warehousing jobs are projected to be added through 2045.

## Fastest Growing Transportation and Warehousing Industries: East Texas

	East Texas Region Job Gains through 2045	Percent of Total Industry Group Increase
Transportation and Warehousing	6,960	
Warehousing and Storage	3,040	41%
Truck Transportation	1,910	29%
Support Activities for Transportation	690	13%
Couriers and Messengers	570	8%
Rail Transportation	390	5%
Pipeline Transportation	220	3%
Source: US Multi-Regional Econometric Model, The Perryman Group		

### Henderson Linkages

The Perryman Group performed a local and regional comparative analysis to determine industries where the area may have a competitive advantage. A comprehensive assessment of sectors benefitting from potential rail enhancements was also conducted. A strong presence in

The Perryman Group performed a local and regional comparative analysis to determine industries where the area may have a competitive advantage.

one industry increases the likelihood of attracting other businesses which may be suppliers or customers. Businesses which use common infrastructure or worker skillsets may also

gravitate toward locations. Potential target industries were identified based on overall industry growth prospects and the degree to which Henderson and the East Texas Region represent advantageous locations.

## Target Industry Overview

The Perryman Group's analysis of potential target industries identified the following types of industries as candidates for recruitment which could offer higher probabilities of success.

- Renewable Energy
- Agriculture/Food Processing (including potential for tourism opportunities related to artisanal foods, wine, or spirits; note that, given the large number of relatively small communities in the region, other tourism opportunities could potentially arise from venues for athletic tournaments or other similar events).
- Wood Products Manufacturing and Stone/Clay/Glass
- Transportation and the Potential for a Multi-Modal Logistics Hub
- Warehousing
- Other Spin-off from Regional Industries (including Plastics, Fabricated Metals, Machinery, Electrical Equipment, and Biomedical)

## Specific Target Industry Sectors

A more detailed list of specific sectors based on the 2017 version of the North American Industry Classification System (NAICS) is presented below. The following descriptions are excerpted and condensed from the "North American Industry Classification System 2017" manual.<sup>43</sup> Lists of firms within each code are available from third-party sources such as the NAICS Association ([www.NAICS.com](http://www.NAICS.com)) and others.

### Renewable Energy

The Henderson area has long been site of utility and related operations, enhancing worker skillsets. A new solar generation facility is under

---

<sup>43</sup> "North American Industry Classification System 2017;" Executive Office of the President, Office of Management and Budget;  
[https://www.census.gov/eos/www/naics/2017NAICS/2017\\_NAICS\\_Manual.pdf](https://www.census.gov/eos/www/naics/2017NAICS/2017_NAICS_Manual.pdf).

development, and, with demand for renewable energy likely to continue, additional businesses of this kind could be recruited.

### **221114 - Solar Electric Power Generation**

This US industry comprises establishments primarily engaged in operating solar electric power generation facilities. These facilities use energy from the sun to produce electric energy. The electric energy produced in these establishments is provided to electric power transmission systems or to electric power distribution systems.

## **Agriculture/Food Processing**

The Henderson area has advantages for agriculture and food processing. Certain sectors within this industry group could also contribute to tourism in the area, particularly wineries and distilleries. Although few grapes are currently grown in the area, craft distilleries (one of which has recently announced a location in a rural East Texas community) or breweries represent other options. Artisanal food products could also contribute to a concentration in the area. Selected potential target sectors are listed below, though it is important to take a broad view of food processing industries for potential recruitment.

### **311 Food Manufacturing**

Industries in the Food Manufacturing subsector transform livestock and agricultural products into products for intermediate or final consumption. The industry groups are distinguished by the raw materials (generally of animal or vegetable origin) processed into food products.

The food products manufactured in these establishments are typically sold to wholesalers or retailers for distribution to consumers, but establishments primarily engaged in retailing bakery and candy products made on the premises not for immediate consumption are included.

**312130 Wineries**

This industry comprises establishments primarily engaged in one or more of the following: (1) growing grapes and manufacturing wines and brandies; (2) manufacturing wines and brandies from grapes and other fruits grown elsewhere; and (3) blending wines and brandies.

**312140 Distilleries**

This industry comprises establishments primarily engaged in one or more of the following: (1) distilling potable liquors (except brandies); (2) distilling and blending liquors; and (3) blending and mixing liquors and other ingredients.

**Regional Tourism**

Development of additional regional tourism could lead to notable additional economic activity over time. Such tourism could be centered on wineries/distilleries as described above or sporting events and tournaments. In either case, additional activity would benefit the local economy.

**Wood Products Manufacturing and Stone/Clay/Glass**

Another potential set of targets includes firms within wood products and stone/clay/glass manufacturing industries. Relevant sectors include the following.

**3212 - Veneer, Plywood, and Engineered Wood Product Manufacturing****321211 - Hardwood Veneer and Plywood Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing hardwood veneer and/or hardwood plywood.

**321212 - Softwood Veneer and Plywood Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing softwood veneer and/or softwood plywood.

**321213 - Engineered Wood Member (except Truss) Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing fabricated or laminated wood arches and/or other fabricated or laminated wood structural members. Examples include finger joint lumber, I-joists, laminated veneers, parallel strand lumber, structural timbers, and glue laminated or pre-engineered wood.

**321214 - Truss Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing laminated or fabricated wood roof and floor trusses.

**321219 - Reconstituted Wood Product Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing reconstituted wood sheets and boards. Examples include medium density fiberboard (MDF) manufacturing, oriented strandboard (OSB) manufacturing, particleboard manufacturing, reconstituted wood sheets and boards manufacturing, and waferboard manufacturing.

**3219 - Other Wood Product Manufacturing**

This industry group comprises establishments primarily engaged in manufacturing wood products (except establishments operating sawmills and wood preservation facilities; and establishments manufacturing veneer, plywood, or engineered wood products).

**321911 - Wood Window and Door Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing window and door units, sash, window and door frames, and doors from wood or wood clad with metal or plastics.

**321912 - Cut Stock, Resawing Lumber, and Planing**

This US industry comprises establishments primarily engaged in one or more of the following: (1) manufacturing dimension lumber from purchased lumber; (2) manufacturing dimension stock (i.e., shapes) or

cut stock; (3) resawing the output of sawmills; and (4) planing purchased lumber. These establishments generally use woodworking machinery, such as jointers, planers, lathes, and routers to shape wood.

### **321918 - Other Millwork (including Flooring)**

This US industry comprises establishments primarily engaged in manufacturing millwork (except wood windows, wood doors, and cut stock).

### **321920 - Wood Container and Pallet Manufacturing**

This industry comprises establishments primarily engaged in manufacturing wood pallets, wood box shoo, wood boxes, other wood containers, and wood parts for pallets and containers.

### **321991 - Manufactured Home (Mobile Home) Manufacturing**

This US industry comprises establishments primarily engaged in making manufactured homes (i.e., mobile homes) and nonresidential mobile buildings. Manufactured homes are designed to accept permanent water, sewer, and utility connections and although equipped with wheels, they are not intended for regular highway movement.

### **321992 - Prefabricated Wood Building Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing prefabricated wood buildings and wood sections and panels for prefabricated wood buildings.

### **321999 - All Other Miscellaneous Wood Product Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing other wood products such as cabinets, cork products, kiln dried lumber, shoe trees, dowels, extension ladders, handles, kitchenware, stepladders, toilet seats, and toothpicks.

## **3272 - Glass and Glass Product Manufacturing**

### **327211 - Flat Glass Manufacturing**

This US industry comprises establishments primarily engaged in (1) manufacturing flat glass by melting silica sand or cullet or (2) manufacturing both flat glass and laminated glass by melting silica sand or cullet.

### **27212 - Other Pressed and Blown Glass and Glassware Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing glass by melting silica sand or cullet and making pressed, blown, or shaped glass or glassware (except glass packaging containers).

### **327213 - Glass Container Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing glass packaging containers.

### **327215 - Glass Product Manufacturing Made of Purchased Glass**

This US industry comprises establishments primarily engaged in coating, laminating, tempering, or shaping purchased glass.

## **3271 - Clay Product and Refractory Manufacturing**

This industry group comprises establishments primarily engaged in (1) shaping, molding, glazing, and firing pottery, ceramics, and plumbing fixtures, and electrical supplies made entirely or partly of clay or other ceramic materials or (2) shaping, molding, baking, burning, or hardening clay refractories, nonclay refractories, ceramic tile, structural clay tile, brick, and other structural clay building materials.

## **Transportation and the Potential for a Multi-Modal Logistics Hub**

Multi-modal logistics involves multiple methods of transportation (ship, rail, and/or truck). For the Henderson area, highway and rail infrastructure could provide a potential opportunity for logistics

involving rail and trucks. In one scenario, trains would carry shipping containers to the local rail terminal where they would then be transferred to trucks for shipment to final destinations. Intermodal is the fastest growing rail service according to the Texas Department of Transportation's 2019 Texas Rail Plan, but it is also very resource intensive for railroads, which must commit to filling trainloads of intermodal boxes and adhere to strict schedules. In addition, the terminals are expensive to build, maintain, and operate.<sup>44</sup> Alternatively, there could be some other arrangements for shipping using both modes.

The US Department of Transportation Federal Railroad Administration recently awarded a Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program grant. These grants fund projects improving the safety, efficiency, and reliability of intercity passenger and freight rail. The Henderson Overton Branch Rail Line Rehab and Train Siding Improvement (Opportunity Zone) grant provides up to \$8,480,323 to improve the safety and reliability of track owned by Rusk County Rural Rail District and operated by the Blacklands Railroad in Rusk County, Texas. The grant will fund installation of new railroad ties to refurbish approximately 13.7 miles of rail between Overton and Henderson; construction of three interchange sidings with Union Pacific at Overton; construction of one unit train siding at Henderson; and purchase of equipment including locomotives, crew cars, and high-railers. Rehabilitation of the line allows for an increase of freight rail speed from 10 to 25 miles per hour, and construction of the sidings will increase operational efficiency and lower operating costs by reducing operating hours by 6 hours every day.

The following sectors represent potential target industries for development of a multi-modal transportation hub in the area.

### **4821 Rail Transportation**

This industry comprises establishments primarily engaged in operating railroads (except street railroads, commuter rail, urban rapid transit, and

---

<sup>44</sup> Texas Department of Transportation, "Texas Rail Plan 2019," <http://ftp.dot.state.tx.us/pub/txdot-info/rail/texas-rail-plan-draft-chapters.pdf>, December 2019.

scenic and sightseeing trains). Line-haul railroads and short-line railroads are included in this industry.

#### **4841 General Freight Trucking**

This industry group comprises establishments primarily engaged in providing general freight trucking. General freight trucking establishments handle a wide variety of commodities, generally palletized, and transported in a container or van trailer. The establishments of this industry group provide a combination of the following network activities: local pick-up, local sorting and terminal operations, line-haul, destination sorting and terminal operations, and local delivery.

##### **484110 General Freight Trucking, Local**

This industry comprises establishments primarily engaged in providing local general freight trucking. General freight trucking establishments handle a wide variety of commodities, generally palletized and transported in a container or van trailer. Local general freight trucking establishments usually provide trucking within a metropolitan area which may cross state lines. Generally, the trips are same-day return.

##### **48412 General Freight Trucking, Long-Distance**

This industry comprises establishments primarily engaged in providing long-distance general freight trucking. General freight trucking establishments handle a wide variety of commodities, generally palletized and transported in a container or van trailer. Long-distance general freight trucking establishments usually provide trucking between metropolitan areas which may cross North American country borders. Included in this industry are establishments operating as truckload (TL) or less than truckload (LTL) carriers.

##### **484121 General Freight Trucking, Long-Distance, Truckload**

This US industry comprises establishments primarily engaged in providing long-distance general freight truckload (TL) trucking. These

long-distance general freight truckload carrier establishments provide full truck movement of freight from origin to destination. The shipment of freight on a truck is characterized as a full single load not combined with other shipments.

#### **484122 General Freight Trucking, Long-Distance, Less Than Truckload**

This US industry comprises establishments primarily engaged in providing long-distance, general freight, less than truckload (LTL) trucking. LTL carriage is characterized as multiple shipments combined onto a single truck for multiple deliveries within a network. These establishments are generally characterized by the following network activities: local pick-up, local sorting and terminal operations, line-haul, destination sorting and terminal operations, and local delivery.

#### **4842 Specialized Freight Trucking**

This industry group comprises establishments primarily engaged in providing local or long-distance specialized freight trucking. The establishments of this industry are primarily engaged in the transportation of freight which, because of size, weight, shape, or other inherent characteristics, requires specialized equipment, such as flatbeds, tankers, or refrigerated trailers. This industry includes the transportation of used household, institutional, and commercial furniture and equipment.

#### **484210 Used Household and Office Goods Moving**

This industry comprises establishments primarily engaged in providing local or long-distance trucking of used household, used institutional, or used commercial furniture and equipment. Incidental packing and storage activities are often provided by these establishments.

#### **484220 Specialized Freight (except Used Goods) Trucking, Local**

This industry comprises establishments primarily engaged in providing local, specialized trucking. Local trucking establishments provide trucking within a metropolitan area that may cross state lines. Generally the trips are same-day return.

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

This industry comprises establishments primarily engaged in providing long-distance specialized trucking. These establishments provide trucking between metropolitan areas that may cross North American country borders. Examples include long-distance automobile carrier trucking, refrigerated product trucking, bulk liquid trucking, trucking of waste, and hazardous material trucking

## **Warehousing**

The Henderson area's transportation infrastructure also gives the area an advantage in warehousing. The following industry groups are potential candidates for recruitment.

### **493 Warehousing and Storage**

Industries in the Warehousing and Storage subsector are primarily engaged in operating warehousing and storage facilities for general merchandise, refrigerated goods, and other warehouse products. These establishments provide facilities to store goods. They do not sell the goods they handle. These establishments take responsibility for storing the goods and keeping them secure. They may also provide a range of services, often referred to as logistics services, related to the distribution of goods. Logistics services can include labeling, breaking bulk, inventory control and management, light assembly, order entry and fulfillment, packaging, pick and pack, price marking and ticketing, and transportation arrangement. However, establishments in this industry group always provide warehousing or storage services in addition to any logistic services. Furthermore, the warehousing or storage of goods must be more than incidental to the performance of services, such as price marking.

Bonded warehousing and storage services and warehouses located in free trade zones are included in the industries of this subsector.

### **493110 General Warehousing and Storage**

This industry comprises establishments primarily engaged in operating merchandise warehousing and storage facilities. These establishments generally handle goods in containers, such as boxes, barrels, and/or drums, using equipment, such as forklifts, pallets, and racks. They are not specialized in handling bulk products of any particular type, size, or quantity of goods or products.

### **493120 Refrigerated Warehousing and Storage**

This industry comprises establishments primarily engaged in operating refrigerated warehousing and storage facilities. Establishments primarily engaged in the storage of furs for the trade are included in this industry. The services provided by these establishments include blast freezing, tempering, and modified atmosphere storage services.

### **493130 Farm Product Warehousing and Storage**

This industry comprises establishments primarily engaged in operating bulk farm product warehousing and storage facilities (except refrigerated). Grain elevators primarily engaged in storage are included in this industry.

### **493190 Other Warehousing and Storage**

This industry comprises establishments primarily engaged in operating warehousing and storage facilities (except general merchandise, refrigerated, and farm product warehousing and storage). Examples include bulk petroleum storage, lumber storage terminals, document storage and warehousing, and whiskey warehousing.

## **Spin-off from Regional Industries**

The Henderson area could also recruit spin-off activity from industries which are growing in other parts of the region. Nearby larger population centers have growing Plastics, Fabricated Metals, Machinery, Electrical Equipment, and Biomedical sectors. In some cases, a supplier/vendor or other related company might favor a

location in a nearby smaller population center such as Henderson. Firms in the following sectors with ties to the East Texas Region represent potential targets for recruitment.

### **3261 Plastics Products**

This industry group comprises establishments primarily engaged in processing new or spent (i.e., recycled) plastics resins into intermediate or final products, using such processes as compression molding; extrusion molding; injection molding; blow molding; and casting. Within most of these industries, the production process is such that a wide variety of products can be made.

#### **32611 Plastics Packaging Materials and Unlaminated Film and Sheets**

This industry comprises establishments primarily engaged in (1) converting plastics resins into unsupported plastics film and sheet and/or (2) forming, coating, or laminating plastics film and sheet into plastics bags.

##### **326111 Plastics Bags and Pouches**

This US industry comprises establishments primarily engaged in (1) converting plastics resins into plastics bags or pouches and/or (2) forming, coating, or laminating plastics film or sheet into single-web or multi-web plastics bags or pouches. Establishments in this industry may print on the bags or pouches they manufacture.

##### **326112 Plastics Packaging Film and Sheet (including Laminated)**

This US industry comprises establishments primarily engaged in converting plastics resins into plastics packaging (flexible) film and packaging sheet.

**326113 Unlaminated Plastics Film and Sheets (except Packaging)**

This US industry comprises establishments primarily engaged in converting plastics resins into plastics film and unlaminated sheet (except packaging).

**32612 Plastics Pipe, Pipe Fittings, and Unlaminated Profile Shapes**

This industry comprises establishments primarily engaged in manufacturing plastics pipes and pipe fittings, and plastics profile shapes such as rod, tube, and sausage casings.

**326121 Unlaminated Plastics Profile Shapes**

This US industry comprises establishments primarily engaged in converting plastics resins into nonrigid plastics profile shapes (except film, sheet, and bags), such as rod, tube, and sausage casings.

**326122 Plastics Pipe and Pipe Fittings**

This US industry comprises establishments primarily engaged in converting plastics resins into rigid plastics pipes and pipe fittings.

**326130 Laminated Plastics Plate, Sheet (except Packaging), Shapes**

This industry comprises establishments primarily engaged in laminating plastics profile shapes such as plate, sheet (except packaging), and rod. The lamination process generally involves bonding or impregnating profiles with plastics resins and compressing them under heat.

**326140 Polystyrene Foam Products**

This industry comprises establishments primarily engaged in manufacturing polystyrene foam products.

### **326150 Urethane and Other Foam Products**

This industry comprises establishments primarily engaged in manufacturing plastics foam products (except polystyrene).

### **326160 Plastics Bottles**

This industry comprises establishments primarily engaged in manufacturing plastics bottles.

### **32619 Other Plastics Products**

This industry comprises establishments primarily engaged in manufacturing plastics plumbing fixtures and other plastics products (except film, sheet, bags, profile shapes, pipes, pipe fittings, laminates, foam products, and bottles). Examples include inflatable plastics swimming pool rafts and similar flotation devices, plastics air mattresses, plastics bottle caps and lids plastics bowls and bowl covers, plastics clothes hangers, plastics cups, plastics dinnerware, plastics gloves, plastics hardware, plastics ice chests or coolers, plastics or fiberglass plumbing fixtures (e.g., toilets, shower stalls, urinals), plastics prefabricated buildings manufacturing, plastics siding manufacturing, plastics trash containers, and resilient floor coverings (e.g., sheet, tiles) manufacturing.

### **3322 Cutlery and Handtools**

This industry comprises establishments primarily engaged in one or more of the following: (1) manufacturing metal kitchen cookware (except by casting (e.g., cast iron skillets) or stamped without further fabrication), utensils, and/or nonprecious and precious plated metal cutlery and flatware; (2) manufacturing saw blades, all types (including those for power sawing machines); and (3) manufacturing nonpowered handtools and edge tools.

**332215 Metal Kitchen Cookware, Utensils, Cutlery, and Flatware**

This US industry comprises establishments primarily engaged in manufacturing metal kitchen cookware (except by casting (e.g., cast iron skillets) or stamped without further fabrication), utensils, and/or nonprecious and precious plated metal cutlery and flatware.

**332216 Saw Blades and Handtools**

This US industry comprises establishments primarily engaged in (1) manufacturing saw blades, all types (including those for power sawing machines) and/or (2) manufacturing nonpowered handtools and edge tools.

**3323 Architectural and Structural Metals Manufacturing**

This industry group comprises establishments primarily engaged in manufacturing one or more of the following: (1) prefabricated metal buildings, panels and sections; (2) structural metal products; (3) metal plate work products; (4) metal framed windows (i.e., typically using purchased glass) and metal doors; (5) sheet metal work; and (6) ornamental and architectural metal products.

**33231 Plate Work and Fabricated Structural Products**

This industry comprises establishments primarily engaged in manufacturing one or more of the following: (1) prefabricated metal buildings, panels and sections; (2) structural metal products; and (3) metal plate work products.

**332311 Prefabricated Metal Building and Components**

This US industry comprises establishments primarily engaged in manufacturing prefabricated metal buildings, panels, and sections.

**332312 Fabricated Structural Metals**

This US industry comprises establishments primarily engaged in fabricating structural metal products, such as assemblies of concrete reinforcing bars and fabricated bar joists.

**332313 Plate Work**

This US industry comprises establishments primarily engaged in manufacturing fabricated metal plate work by cutting, punching, bending, shaping, and welding purchased metal plate.

**33232 Ornamental and Architectural Metal Products**

This industry comprises establishments primarily engaged in manufacturing one or more of the following: (1) metal framed windows (i.e., typically using purchased glass) and metal doors; (2) sheet metal work; and (3) ornamental and architectural metal products.

**332321 Metal Windows and Doors**

This US industry comprises establishments primarily engaged in manufacturing metal framed windows (i.e., typically using purchased glass) and metal doors. Examples of products made by these establishments are metal door frames; metal framed window and door screens; and metal molding and trim (except automotive).

**332322 Sheet Metal Work**

This US industry comprises establishments primarily engaged in manufacturing sheet metal work (except stampings).

**332323 Ornamental and Architectural Metal Work**

This US industry comprises establishments primarily engaged in manufacturing ornamental and architectural metal work, such as staircases, metal open steel flooring, fire escapes, railings, and scaffolding.

### **3324 Boilers, Tanks, and Shipping Containers**

This industry group comprises establishments primarily engaged in one of the following: (1) manufacturing power boilers and heat exchangers; (2) cutting, forming, and joining heavy gauge metal to manufacture tanks, vessels, and other containers; or (3) forming light gauge metal containers.

### **3325 Hardware Manufacturing**

This industry comprises establishments primarily engaged in manufacturing metal hardware, such as metal hinges, metal handles, keys, and locks (except coin-operated, time locks).

### **33261 Spring and Wire Product Manufacturing**

This industry comprises establishments primarily engaged in (1) manufacturing steel springs by forming, such as cutting, bending, and heat winding, metal rod or strip stock and/or (2) manufacturing wire springs and fabricated wire products from wire drawn elsewhere (except watch and clock springs).

### **3327 Machine Shops; Turned Products; and Screws, Nuts, and Bolts**

This industry group comprises establishments primarily engaged in one of the following: (1) operating machine shops primarily engaged in machining metal and plastic parts and parts of other composite materials on a job or order basis; (2) machining precision turned products; or (3) manufacturing metal bolts, nuts, screws, rivets, and other industrial fasteners.

### **332710 Machine Shops**

This industry comprises establishments known as machine shops primarily engaged in machining metal and plastic parts and parts of other composite materials on a job or order basis. Generally, machine shop jobs are low volume using machine tools, such as lathes (including computer numerically controlled); automatic screw machines; and machines for boring, grinding, milling, and additive manufacturing.

### **33272 Turned Product and Screw, Nut, and Bolt Manufacturing**

This industry comprises establishments primarily engaged in (1) machining precision turned products or (2) manufacturing metal bolts, nuts, screws, rivets, and other industrial fasteners. Included in this industry are establishments primarily engaged in manufacturing parts for machinery and equipment on a custom basis.

### **3328 Coating, Engraving, Heat Treating, and Allied Activities**

This industry comprises establishments primarily engaged in one or more of the following: (1) heat treating metals and metal products; (2) enameling, lacquering, and varnishing metals and metal products; (3) hot dip galvanizing metals and metal products; (4) engraving, chasing, or etching metals and metal products (except jewelry; personal goods carried on or about the person, such as compacts and cigarette cases; precious metal products (except precious plated flatware and other plated ware); and printing plates); (5) powder coating metals and metal products; (6) electroplating, plating, anodizing, coloring, and finishing metals and metal products; and (7) providing other metal surfacing services for the trade. Establishments in this industry coat, engrave, and heat treat metals and metal formed products fabricated elsewhere.

#### **332811 Metal Heat Treating**

This US industry comprises establishments primarily engaged in heat treating, such as annealing, tempering, and brazing, and cryogenically treating metals and metal products for the trade.

#### **332812 Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers**

This US industry comprises establishments primarily engaged in one or more of the following: (1) enameling, lacquering, and varnishing metals and metal products; (2) hot dip galvanizing metals and metal products; (3) engraving, chasing, or etching metals and metal products (except jewelry; personal goods carried on or about the person, such as compacts and cigarette cases; precious metal products (except precious plated flatware and other plated ware); and printing plates); (4) powder

coating metals and metal products; and (5) providing other metal surfacing services for the trade. Included in this industry are establishments that perform these processes on other materials, such as plastics, in addition to metals.

### **332813 Electroplating, Plating, Polishing, Anodizing, and Coloring**

This US industry comprises establishments primarily engaged in electroplating, plating, anodizing, coloring, buffing, polishing, cleaning, and sandblasting metals and metal products for the trade. Included in this industry are establishments that perform these processes on other materials, such as plastics, in addition to metals.

### **3329 Other Fabricated Metal Product Manufacturing**

This industry group comprises establishments primarily engaged in manufacturing fabricated metal products (except forgings and stampings, cutlery and handtools, architectural and structural metals, boilers, tanks, shipping containers, hardware, spring and wire products, machine shop products, turned products, screws, and nuts and bolts).

### **33291 Metal Valve Manufacturing**

This industry comprises establishments primarily engaged in manufacturing one or more of the following metal valves: (1) industrial valves; (2) fluid power valves and hose fittings; (3) plumbing fixture fittings and trim; and (4) other metal valves and pipe fittings.

### **332911 Industrial Valve Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing industrial valves and valves for water works and municipal water systems.

### **332912 Fluid Power Valve and Hose Fitting Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing fluid power valves and hose fittings.

### **332913 Plumbing Fixture Fitting and Trim Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing metal and plastics plumbing fixture fittings and trim, such as faucets, flush valves, and shower heads.

### **332919 Other Metal Valve and Pipe Fitting Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing metal valves (except industrial valves, fluid power valves, fluid power hose fittings, and plumbing fixture fittings and trim). Examples include aerosol valves, firefighting nozzles, lawn hose nozzles, lawn sprinklers, metal hose couplings (except fluid power), metal pipe flanges and flange unions, water traps, and plumbing and heating inline valves (e.g., check, cutoff, stop) manufacturing.

### **33299 All Other Fabricated Metal Product Manufacturing**

This industry comprises establishments primarily engaged in manufacturing fabricated metal products such as ammunition, ball and roller bearings, enameled iron and metal sanitary ware, fabricated pipe and pipe fittings made from purchased metal pipe, foil containers (except bags), industrial patterns, metal safes, portable metal ladders, small arms and other ordnance, and steel wool manufacturing.

## **333 Machinery Manufacturing**

Industries in the Machinery Manufacturing subsector create end products that apply mechanical force, for example, the application of gears and levers, to perform work. Some important processes for the manufacture of machinery are forging, stamping, bending, forming, and machining that are used to shape individual pieces of metal. Processes, such as welding and assembling are used to join separate parts together. Although these processes are similar to those used in metal fabricating establishments, machinery manufacturing is different because it typically employs multiple metal forming processes in manufacturing the various parts of the machine. Moreover, complex assembly operations are an inherent part of the production process.

In general, design considerations are very important in machinery production. Establishments specialize in making machinery designed for particular applications. Thus, design is considered to be part of the production process for the purpose of implementing NAICS. The NAICS structure reflects this by defining industries and industry groups that make machinery for different applications. A broad distinction exists between machinery that is generally used in a variety of industrial applications (i.e., general purpose machinery) and machinery that is designed to be used in a particular industry (i.e., special purpose machinery). Three industry groups consist of special purpose machinery--Agricultural, Construction, and Mining Machinery Manufacturing; Industrial Machinery Manufacturing; and Commercial and Service Industry Machinery Manufacturing. The other industry groups make general purpose machinery: Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing; Metalworking Machinery Manufacturing; Engine, Turbine, and Power Transmission Equipment Manufacturing; and Other General Purpose Machinery Manufacturing.

### **3353 - Electrical Equipment Manufacturing**

This industry comprises establishments primarily engaged in manufacturing power, distribution, and specialty transformers; electric motors, generators, and motor generator sets; switchgear and switchboard apparatus; relays; and industrial controls.

#### **335311 Power, Distribution, and Specialty Transformer Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing power, distribution, and specialty transformers (except electronic components). Industrial-type and consumer-type transformers in this industry vary (e.g., step up or step down) voltage but do not convert alternating to direct or direct to alternating current. Examples include fluorescent ballasts (i.e., transformers), substation transformers, distribution transformers, and transmission and distribution voltage regulators.

**335312 Motor and Generator Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing electric motors (except internal combustion engine starting motors), power generators (except battery charging alternators for internal combustion engines), and motor generator sets (except turbine generator set units). This industry includes establishments rewinding armatures on a factory basis.

**335313 Switchgear and Switchboard Apparatus Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing switchgear and switchboard apparatus. Examples include circuit breakers and control panels for electric power distribution, ducts for electrical switchboard apparatus, electric fuses, power switching equipment, and certain types of electric power switches manufacturing.

**335314 Relay and Industrial Control Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing relays, motor starters and controllers, and other industrial controls and control accessories.

**3359 Other Electrical Equipment and Component Manufacturing**

This industry group comprises establishments manufacturing electrical equipment and components (except electric lighting equipment, household-type appliances, transformers, switchgear, relays, motors, and generators).

**33591 Battery Manufacturing**

This industry comprises establishments primarily engaged in manufacturing primary and storage batteries.

**33592 Communication and Energy Wire and Cable Manufacturing**

This industry comprises establishments insulating fiber optic cable, and manufacturing insulated nonferrous wire and cable from nonferrous wire drawn in other establishments.

**33593 Wiring Device Manufacturing**

This industry comprises establishments primarily engaged in manufacturing current-carrying wiring devices and noncurrent-carrying wiring devices for wiring electrical circuits.

**33599 All Other Electrical Equipment and Component Manufacturing**

This industry comprises establishments primarily engaged in manufacturing electrical equipment (except electric lighting equipment, household-type appliances, transformers, motors, generators, switchgear, relays, industrial controls, batteries, communication and energy wire and cable, and wiring devices).

**335999 All Other Miscellaneous Electrical Equipment and Component Manufacturing**

This US industry comprises establishments primarily engaged in manufacturing industrial and commercial electric apparatus and other equipment. This industry includes power converters (i.e., AC to DC and DC to AC), power supplies, surge suppressors, and similar equipment for industrial-type and consumer-type equipment. Examples include appliance cords made from purchased insulated wire, battery chargers, door opening and closing devices, electric bells, extension cords, inverters, surge suppressors, and uninterruptible power supplies (UPS) manufacturing.

**33911 Medical Equipment and Supplies Manufacturing**

This industry comprises establishments primarily engaged in manufacturing medical equipment and supplies. Examples of products made by these establishments are surgical and medical instruments, surgical appliances and supplies, dental equipment and supplies, orthodontic goods, ophthalmic goods, dentures, and orthodontic appliances.

## Multiplier Analysis

Selected potential target industries and the associated multipliers (which reflect the level of spinoff activity which could be expected) are presented in the following table. For further discussion of ripple effects through the economy, see the description of the US Multi-Regional Impact Assessment System in Appendix A.

<b>Multipliers Associated with Selected Target Industries for the Henderson Area</b>	
<b>Industry</b>	<b>Local Multiplier</b>
221114 Solar Electric Power Generation	3.23
312130 Wineries	2.44
312140 Distilleries	1.78
Regional Tourism	1.88
3212 Veneer, Plywood, and Engineered Wood Product Manufacturing	2.09
3219 Other Wood Product Manufacturing	2.24
3272 Glass and Glass Product Manufacturing	2.40
3271 Clay Product and Refractory Manufacturing	2.43
4821 Rail Transportation	2.55
4841 General Freight Trucking	2.51
493 Warehousing and Storage	2.72
3261 Plastics Products	2.06
3322 Cutlery and Handtools	2.11
3323 Architectural and Structural Metals Manufacturing	2.20
3324 Boilers, Tanks, and Shipping Containers	2.18
3325 Hardware Manufacturing	2.16
33261 Spring and Wire Product Manufacturing	2.21
3327 Machine Shops; Turned Products; and Screws, Nuts, and Bolts	2.27
3328 Coating, Engraving, Heat Treating, and Allied Activities	2.30
3329 Other Fabricated Metal Product Manufacturing	2.22
333 Machinery Manufacturing	2.57
3353 Electrical Equipment Manufacturing	2.77
3359 Other Electrical Equipment and Component Manufacturing	2.92
33911 Medical Equipment and Supplies Manufacturing	2.37

Source: The Perryman Group

## Conclusion

Desirable economic development and long-term prosperity require proactive efforts. The socioeconomic profile of the Henderson area provided in this report can be used in formulating strategic plans to

**For smaller communities, proactive economic development is particularly crucial to future prosperity as the economy becomes increasingly concentrated in the largest population centers.**

enhance the area's ability to meet the needs of businesses. The list of potential target industries provides insight into the types of companies where the Henderson area has the highest probability of success. Given scarce taxpayer resources, concentrating efforts in these areas is likely to yield the greatest returns.

For smaller communities, proactive economic development is particularly crucial to future prosperity as the economy becomes increasingly concentrated in the largest population centers. The Henderson area offers many advantages for certain types of firms, and a development plan which builds on these advantages can increase opportunities for area residents and businesses in the decades to come.

# Appendix A: Methods Used

## Target Industry Identification Process

---

Target industry selection as implemented by The Perryman Group is a highly analytical process focused on identifying sectors with the best combination of competitive advantages for the community and outlook for future expansion. This comprehensive approach includes a detailed assessment of the local economy, as well as an evaluation of the relevant industries.

Target industries were developed based on a comprehensive analysis of

- the current industrial base in the Henderson area,
- potential supplier network synergies with existing producers,
- proximity to customers and markets,
- workforce capabilities of local residents and training opportunities,
- relative competitive advantages for particular industries,
- projected growth in key sectors, and
- other factors which can contribute to success in site selection.

The process involves use of an extensive set of models and systems developed by The Perryman Group which specifically reflect the underlying structure of the Henderson economy and that of the surrounding area.

The identification of target industry clusters begins with a detailed assessment of the capabilities of the area to support various types of production. One aspect of this initial phase is to examine the existing industrial base of the area and determine the associated primary potential suppliers and customers. This “linkage analysis” identifies sectors that might achieve costs savings from proximity of other factors as a result of interrelationships in the production chain. It further facilitates the identification of core clusters of activity in which multiple, related categories of complementary activity provide a mutual reinforcement of competitiveness. This procedure uses the extensive database developed and maintained by The Perryman Group and tracks the interactions among industries using the coefficients of the **US Multi-Regional Impact Assessment System** (described below).

Further evaluation of the suitable sectors is obtained from a determination of net export capabilities. An area is a net exporter of a good or service if it produces more than is required to meet its local needs. When a region is a net

exporter, it has demonstrated a competitive advantage in the resources and requirements for the relevant type of production. If the region is relatively close to being a net exporter (generally measured by an export/import ratio in excess of 0.7), then potential exists for future locations, and it is unlikely that there are any substantial structural impediments.

This net export analysis and similar performance indicator assessments are conducted using simulations of the relevant geographic submodels (Texas and the Upper East Texas and East Texas Regions) of the **US Multi-Regional Econometric Model** (described below). This system was used in developing current estimates of activity and baseline industry growth forecasts.

The final “technical” aspect of the regional target industry cluster analysis examines local workforce characteristics using the **US Multi-Regional Industry-Occupation System** (described below). Employment by occupations derived from the system can be matched with job requirements in various sectors to determine potential targets for new locations.

Through the merger of linkages, current competitive advantages, and workforce capabilities, a viable list of preliminary industry groups for potential recruitment may be determined for a given area. This list is then refined through an assessment of any barriers which might preclude success (such as raw material requirements, air quality, or transportation needs). Industries are also matched with community priorities in order to assure a proper “fit” with long-range objectives.

The final step in the process departs from region-specific considerations and takes a “top down” look at the relevant industries. By examining state and national econometric models, global trade and production patterns, and extensive literature on various market segments, sectors with a reasonable likelihood of opening or expanding existing plants are identified. Emerging industries are also identified. The final set of target clusters is, then, those for which the area has the requisite resources and competitive strengths and prospects for future development are promising.

This analysis is restricted to those sectors—such as manufacturing, sophisticated business and health services, utilities, distribution, and telecommunications—which tend to serve external markets and, thus, bring resources into a region. Collateral activity in segments such as retail outlets, restaurants, hospitality, and housing will occur in a growing economy, and is

reflected in the “multiplier” analysis. The resulting list represents viable possibilities for expansion in the area.



## US Multi-Regional Econometric Model

---

### Overview

The US Multi-Regional Econometric Model was developed by Dr. M. Ray Perryman, President and CEO of The Perryman Group (TPG), about 40 years ago and has been consistently maintained, expanded, and updated since that time. It is formulated in an internally consistent manner and is designed to permit the integration of relevant global, national, state, and local factors into the projection process. It is the result of four decades of continuing research in econometrics, economic theory, statistical methods, and key policy issues and behavioral patterns, as well as intensive, ongoing study of all aspects of the global, US, state, and metropolitan area economies. It is extensively used by scores of federal and State governmental entities on an ongoing basis, as well as hundreds of major corporations. It can be integrated with The Perryman Group's other models and systems to provide dynamic projections.

This section describes the forecasting process in a comprehensive manner, focusing on both the modeling and the supplemental analysis. The overall methodology, while certainly not ensuring perfect foresight, permits an enormous body of relevant information to impact the economic outlook in a systematic manner.

### Model Logic and Structure

The Model revolves around a core system which projects output (real and nominal), income (real and nominal), and employment by industry in a simultaneous manner. For purposes of illustration, it is useful to initially consider the employment functions. Essentially, employment within the system is a derived demand relationship obtained from a neo-Classical production function. The expressions are augmented to include dynamic temporal adjustments to changes in relative factor input costs, output and (implicitly) productivity, and technological progress over time. Thus, the typical equation includes output, the relative real cost of labor and capital, dynamic lag structures, and a technological adjustment parameter. The functional form is logarithmic, thus preserving the theoretical consistency with the neo-Classical formulation.

The income segment of the model is divided into wage and non-wage components. The wage equations, like their employment counterparts, are individually estimated at the 3-digit North American Industry Classification System (NAICS) level of aggregation. Hence, income by place of work is measured for approximately 90 production categories. The wage equations measure real compensation, with the form of the variable structure differing between “basic” and “non-basic.”

The basic industries, comprised primarily of the various components of Mining, Agriculture, and Manufacturing, are export-oriented, i.e., they bring external dollars into the area and form the core of the economy. The production of these sectors typically flows into national and international markets; hence, the labor markets are influenced by conditions in areas beyond the borders of the particular region. Thus, real (inflation-adjusted) wages in the basic industry are expressed as a function of the corresponding national rates, as well as measures of local labor market conditions (the reciprocal of the unemployment rate), dynamic adjustment parameters, and ongoing trends.

The “non-basic” sectors are somewhat different in nature, as the strength of their labor markets is linked to the health of the local export sectors. Consequently, wages in these industries are related to those in the basic segment of the economy. The relationship also includes the local labor market measures contained in the basic wage equations.

Note that compensation rates in the export or “basic” sectors provide a key element of the interaction of the regional economies with national and international market phenomena, while the “non-basic” or local industries are strongly impacted by area production levels. Given the wage and employment equations, multiplicative identities in each industry provide expressions for total compensation; these totals may then be aggregated to determine aggregate wage and salary income. Simple linkage equations are then estimated for the calculation of personal income by place of work.

The non-labor aspects of personal income are modeled at the regional level using straightforward empirical expressions relating to national performance, dynamic responses, and evolving temporal patterns. In some instances (such as dividends, rents, and others) national variables (for example, interest rates) directly enter the forecasting system. These factors have numerous other implicit linkages into the system resulting from their simultaneous interaction with other phenomena in national

and international markets which are explicitly included in various expressions.

The output or gross area product expressions are also developed at the 3-digit NAICS level. Regional output for basic industries is linked to national performance in the relevant industries, local and national production in key related sectors, relative area and national labor costs in the industry, dynamic adjustment parameters, and ongoing changes in industrial interrelationships (driven by technological changes in production processes).

Output in the non-basic sectors is modeled as a function of basic production levels, output in related local support industries (if applicable), dynamic temporal adjustments, and ongoing patterns. The inter-industry linkages are obtained from the input-output (impact assessment) system which is part of the overall integrated modeling structure maintained by The Perryman Group. Note that the dominant component of the econometric system involves the simultaneous estimation and projection of output (real and nominal), income (real and nominal), and employment at a disaggregated industrial level. This process, of necessity, also produces projections of regional price deflators by industry. These values are affected by both national pricing patterns and local cost variations and permit changes in prices to impact other aspects of economic behavior. Income is converted from real to nominal terms using Texas Consumer Price Index, which fluctuates in response to national pricing patterns and unique local phenomena.

Several other components of the model are critical to the forecasting process. The demographic module includes (1) a linkage equation between wage and salary (establishment) employment and household employment, (2) a labor force participation rate function, and (3) a complete population system with endogenous migration. Given household employment, labor force participation (which is a function of economic conditions and evolving patterns of worker preferences), and the working age population, the unemployment rate and level become identities.

The population system uses Census information, fertility rates, and life tables to determine the “natural” changes in population by age group. Migration, the most difficult segment of population dynamics to track, is estimated in relation to relative regional and extra-regional economic

conditions over time. Because evolving economic conditions determine migration in the system, population changes are allowed to interact simultaneously with overall economic conditions. Through this process, migration is treated as endogenous to the system, thus allowing population to vary in accordance with relative business performance (particularly employment).

Real retail sales is related to income, interest rates, dynamic adjustments, and patterns in consumer behavior on a store group basis. It is expressed on an inflation-adjusted basis. Inflation at the state level relates to national patterns, indicators of relative economic conditions, and ongoing trends. As noted earlier, prices are endogenous to the system.

A final significant segment of the forecasting system relates to real estate absorption and activity. The short-term demand for various types of property is determined by underlying economic and demographic factors, with short-term adjustments to reflect the current status of the pertinent building cycle. In some instances, this portion of the forecast requires integration with the US Multi-Regional Industry-Occupation System which is maintained by The Perryman Group. This system also allows any employment simulation or forecast from the econometric model to be translated into a highly detailed occupational profile.

The overall US Multi-Regional Econometric Model contains numerous additional specifications, and individual expressions are modified to reflect alternative lag structures, empirical properties of the estimates, simulation requirements, and similar phenomena. Moreover, it is updated on an ongoing basis as new data releases become available. Nonetheless, the above synopsis offers a basic understanding of the overall structure and underlying logic of the system.

### **Model Simulation and Multi-Regional Structure**

The initial phase of the simulation process is the execution of a standard non-linear algorithm for the state system and that of each of the individual sub-areas. The external assumptions are derived from scenarios developed through national and international models and extensive analysis by The Perryman Group.

Once the initial simulations are completed, they are merged into a single system with additive constraints and interregional flows. Using

information on minimum regional requirements, import needs, export potential, and locations, it becomes possible to balance the various forecasts into a mathematically consistent set of results. This process is, in effect, a disciplining exercise with regard to the individual regional (including metropolitan and rural) systems. By compelling equilibrium across all regions and sectors, the algorithm ensures that the patterns in state activity are reasonable in light of smaller area dynamics and, conversely, that the regional outlooks are within plausible performance levels for the state as a whole.

The iterative simulation process has the additional property of imposing a global convergence criterion across the entire multi-regional system, with balance being achieved simultaneously on both a sectoral and a geographic basis. This approach is particularly critical on non-linear dynamic systems, as independent simulations of individual systems often yield unstable, non-convergent outcomes.

It should be noted that the underlying data for the modeling and simulation process are frequently updated and revised by the various public and private entities compiling them. Whenever those modifications to the database occur, they bring corresponding changes to the structural parameter estimates of the various systems and the solutions to the simulation and forecasting system. The multi-regional version of the econometric model is re-estimated and simulated with each such data release, thus providing a constantly evolving and current assessment of state and local business activity.

### The Final Forecast

The process described above is followed to produce an initial set of projections. Through the comprehensive multi-regional modeling and simulation process, a systematic analysis is generated which accounts for both historical patterns in economic performance and inter-relationships and best available information on the future course of pertinent external factors. While the best available techniques and data are employed in this effort, they are not capable of directly capturing “street sense,” i.e., the contemporaneous and often non-quantifiable information that can materially affect economic outcomes. In order to provide a comprehensive approach to the prediction of business conditions, it is necessary to compile and assimilate extensive material regarding current events and factors both across the state of Texas and elsewhere.

This critical aspect of the forecasting methodology includes activities such as (1) daily review of hundreds of financial and business publications and electronic information sites; (2) review of major newspapers and online news sources in the state on a daily basis; (3) dozens of hours of direct telephone interviews with key business and political leaders in all parts of the state; (4) face-to-face discussions with representatives of major industry groups; and (5) frequent site visits to the various regions of the state. The insights arising from this “fact finding” are analyzed and evaluated for their effects on the likely course of the future activity.

Another vital information resource stems from the firm’s ongoing interaction with key players in the international, domestic, and state economic scenes. Such activities include visiting with corporate groups on a regular basis and being regularly involved in the policy process at all levels. The firm is also an active participant in many major corporate relocations, economic development initiatives, and regulatory proceedings.

Once organized, this information is carefully assessed and, when appropriate, independently verified. The impact on specific communities and sectors that is distinct from what is captured by the econometric system is then factored into the forecast analysis. For example, the opening or closing of a major facility, particularly in a relatively small area, can cause a sudden change in business performance that will not be accounted for by either a modeling system based on historical relationships or expected (primarily national and international) factors.

The final step in the forecasting process is the integration of this material into the results in a logical and mathematically consistent manner. In some instances, this task is accomplished through “constant adjustment factors” which augment relevant equations. In other cases, anticipated changes in industrial structure or regulatory parameters are initially simulated within the context of the Multi-Regional Impact Assessment System to estimate their ultimate effects by sector. Those findings are then factored into the simulation as constant adjustments on a distributed temporal basis. Once this scenario is formulated, the extended system is again balanced across regions and sectors through an iterative simulation algorithm analogous to that described in the preceding section.

## US Multi-Regional Impact Assessment System

---

The Perryman Group's US Multi-Regional Impact Assessment System (USMRIAS) measures multiplier effects of economic stimuli. It can also be used to study the linkages among industries and economies. The basic modeling technique employed in this study is known as dynamic input-output analysis, which essentially uses extensive survey data, industry information, and a variety of corroborative source materials to create a matrix describing the various goods and services (known as resources or inputs) required to produce one unit (a dollar's worth) of output for a given sector. Once the base information is compiled, it can be mathematically simulated to generate evaluations of the magnitude of successive rounds of activity involved in the overall production process.

There are two essential steps in conducting an input-output analysis once the system is operational. The first major endeavor is to accurately define the levels of direct activity to be evaluated. Once the direct effects are estimated, total economic impacts were quantified through model simulation as described below.

Simulations of the input-output system were utilized to measure overall economic effects of savings. The US Multi-Regional Impact Assessment System (USMRIAS) which was developed and is maintained by The Perryman Group. This model has been used in hundreds of diverse applications across the country and has an excellent reputation for accuracy and credibility; it has also been peer reviewed on multiple occasions. The systems used in the current simulations reflect the unique industrial structures of each of the study areas examined.

The USMRIAS is somewhat similar in format to the Input-Output Model of the United States which is maintained by the US Department of Commerce. The model developed by TPG, however, incorporates several important enhancements and refinements. Specifically, the expanded system includes (1) comprehensive 500-sector coverage for any county, multi-county, or urban region; (2) calculation of both total expenditures and value-added by industry and region; (3) direct estimation of expenditures for multiple basic input choices (expenditures, output, income, or employment); (4) extensive parameter localization; (5) price adjustments for real and nominal assessments by sectors and areas; (6) measurement of the induced impacts associated with payrolls and consumer spending; (7) embedded modules to estimate multi-sectoral direct spending effects; (8) estimation of retail spending activity by

consumers; and (9) comprehensive linkage and integration capabilities with a wide variety of econometric, real estate, occupational, and fiscal impact models.

The impact assessment (input-output) process essentially estimates the amounts of all types of goods and services required to produce one unit (a dollar's worth) of a specific type of output. For purposes of illustrating the nature of the system, it is useful to think of inputs and outputs in dollar (rather than physical) terms. As an example, the construction of a new building will require specific dollar amounts of lumber, glass, concrete, hand tools, architectural services, interior design services, paint, plumbing, and numerous other elements. Each of these suppliers must, in turn, purchase additional dollar amounts of inputs. This process continues through multiple rounds of production, thus generating subsequent increments to business activity. The initial process of building the facility is known as the direct effect. The ensuing transactions in the output chain constitute the indirect effect.

Another pattern that arises in response to any direct economic activity comes from the payroll dollars received by employees at each stage of the production cycle. As workers are compensated, they use some of their income for taxes, savings, and purchases from external markets. A substantial portion, however, is spent locally on food, clothing, health care services, utilities, housing, recreation, and other items. Typical purchasing patterns in the relevant areas are obtained from the Center for Community and Economic Research Cost of Living Index, a privately compiled inter-regional measure which has been widely used for several decades, and the Consumer Expenditure Survey of the US Department of Labor. These initial outlays by area residents generate further secondary activity as local providers acquire inputs to meet this consumer demand. These consumer spending impacts are known as the induced effect. The USMRIAS is designed to provide realistic, yet conservative, estimates of these phenomena.

Sources for information used in this process include the Bureau of the Census, the Bureau of Labor Statistics, the Regional Economic Information System of the US Department of Commerce, and other public and private sources. The pricing data are compiled from the US Department of Labor and the US Department of Commerce. The verification and testing procedures make use of extensive public and private sources.

Impacts were measured in constant 2019 dollars to eliminate the effects of inflation.

The USMRIAS generates estimates of the effect on several measures of business activity. The most comprehensive measure of economic activity used in this study is Total Expenditures. This measure incorporates every dollar that changes hands in any transaction. For example, suppose a farmer sells wheat to a miller for \$0.50; the miller then sells flour to a baker for \$0.75; the baker, in turn, sells bread to a customer for \$1.25. The Total Expenditures recorded in this instance would be \$2.50, that is,  $\$0.50 + \$0.75 + \$1.25$ . This measure is quite broad but is useful in that (1) it reflects the overall interplay of all industries in the economy, and (2) some key fiscal variables such as sales taxes are linked to aggregate spending.

A second measure of business activity frequently employed in this analysis is that of Gross Product. This indicator represents the regional equivalent of Gross Domestic Product, the most commonly reported statistic regarding national economic performance. In other words, the Gross Product of Texas is the amount of US output that is produced in that state; it is defined as the value of all final goods produced in a given region for a specific period of time. Stated differently, it captures the amount of value-added (gross area product) over intermediate goods and services at each stage of the production process, that is, it eliminates the double counting in the Total Expenditures concept. Using the example above, the Gross Product is \$1.25 (the value of the bread) rather than \$2.50. Alternatively, it may be viewed as the sum of the value-added by the farmer, \$0.50; the miller, \$0.25 ( $\$0.75 - \$0.50$ ); and the baker, \$0.50 ( $\$1.25 - \$0.75$ ). The total value-added is, therefore, \$1.25, which is equivalent to the final value of the bread. In many industries, the primary component of value-added is the wage and salary payments to employees.

The third gauge of economic activity used in this evaluation is Personal Income. As the name implies, Personal Income is simply the income received by individuals, whether in the form of wages, salaries, interest, dividends, proprietors' profits, or other sources. It may thus be viewed as the segment of overall impacts which flows directly to the citizenry.

The final aggregates used are Jobs and Job-Years, which reflect the full-time equivalent jobs generated by an activity. For an economic stimulus expected to endure (such as the ongoing operations of a facility), the Jobs measure is used. It should be noted that, unlike the dollar values described above, Jobs is a "stock" rather than a "flow." In other words, if an area produces \$1 million in output in 2018 and \$1 million in 2019, it is appropriate to say that \$2 million was achieved in the 2018-19 period. If the same area has 100 people working in 2018 and 100 in 2019, it only has 100 Jobs. When a flow of jobs is

measured, such as in a construction project or a cumulative assessment over multiple years, it is appropriate to measure employment in Job-Years (a person working for a year, though it could be multiple people working for partial years). This concept is distinct from Jobs, which anticipates that the relevant positions will be maintained on a continuing basis.

## US Multi-Regional Industry-Occupation System

---

The Perryman Group's **US Multi-Regional Industry-Occupation System** translates standard data on employment by industry (derived from the US Multi-Regional Econometric Model, the US Multi-Regional Impact Assessment System, or other sources) into estimates of occupational categories at a highly detailed level.

The modeling process begins with the industry-occupation coefficients compiled by the US Department of Labor based on extensive surveys of operating patterns in thousands of firms and other secondary sources. As an example, a typical tire plant of a given size requires machinists, mechanics, plant managers, administrative staff, custodial staff, shipping personnel, and numerous other types of workers. By compiling this information across the entire economy, a matrix is created which allows the data on employment by industry (which is regularly projected) to be translated into employment by occupation.

The US Multi-Regional Industry-Occupation System links this basic structure specifically to the economy of every metropolitan area, region, and county in the US, accounting for productivity and production patterns in each area. It is also regularly updated to reflect evolving patterns. The system can be fully integrated with historical employment data and the projections obtained from the US Multi-Regional Econometric Model. It can also be linked to results from the US Multi-Regional Impact Assessment System. Thus, the industry-occupation system is a flexible mechanism to allow extensive evaluations of workforce characteristics and patterns. It is highly detailed, providing results for more than 1,000 occupational categories.

In the present study, it was used as an element of the target industry identification process.