

# WORKFORCE ANALYSIS

### **MIDAMERICA INDUSTRIAL PARK**

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### **WORKFORCE ANALYSIS OVERVIEW**



MidAmerica Industrial Park ("MAIP") is Oklahoma's largest industrial park. Encompassing more than 9,000 acres and housing Fortune 500 companies like Google, Chevron, and DuPont, among other manufacturers and logistics operations, the park is an industrial powerhouse of northeast Oklahoma. Situated between Tulsa and Northwest Arkansas, the largest concentration of corporate wealth in the nation, MidAmerica provides unique economic development advantages

To ensure that the park is able to best recruit new businesses, along with supporting the workforce needs of existing ones, MAIP engaged Site Selection Group ("SSG"), a location advisory firm, to conduct a labor market assessment of the region. SSG previously completed a workforce analysis for MAIP in the summer of 2017 in conjunction with a more comprehensive analysis of the greater Tulsa region.

This document updates that report with refreshed data from the current year. Specifically, this document focus on:

- **Underlying Demographics:** Population, labor force, age, income, and education statistics.
- **Commuting Analysis:** Realistic labor shed for employers in MAIP to attract workers from.
- **Occupational Dynamics:** Supply and demand of key occupational clusters aligned with MAIP's industrial makeup and target industries.
- Organized Labor: Presence of unions and organization attempts.
- Educational Completions: Summary of educational completions in key categories.

# **SSG'S APPROACH TO WORKFORCE ANALYSIS**

### DEMOGRAPHICS



- Population Growth
- Age Profiles
- Educational Attainment
- Realistic Labor Shed

Are there enough and the right types of people to staff my operation?

### **OCCUPATIONAL DYNAMICS**



 Supply, demand, and wages for key occupational clusters like production, logistics, maintenance, engineering, and other skill sets

How do I balance access to critical skills vs. competition?

### WORKFORCE TRAINING



- K-12
- Technical Training
- Colleges & Universities
- Collaboration

Can I work with education & training now and in the future to meet hiring needs?

The graphic above shows the broad categories under which SSG performs workforce analyses on behalf of its corporate clients. While every project requirement is different and each is driven by different objectives, almost all clients want to be in a location that has 1) aligned demographics, 2) target mix of occupational supply and demand, and 3) robust workforce training and educational opportunities.

As a result, SSG applies the same perspective to its workforce analyses on behalf of economic development organizations and here, for the Mid-America Industrial Park. It is critical to use this framework to identify where a community's workforce value proposition truly lies. For some markets, that value proposition could be based on favorable population and demographic trends. For others, it could be lower levels of competition.

The following pages summarize MAIP's strengths and weaknesses through the lens of these three categories as evaluated by SSG.

### **COMPARISON MARKETS**



In SSG's view, there is no such thing as the simple concept of a "good" workforce. While some markets have more favorable workforce conditions, there are always tradeoffs. For a community that has favorable growth and occupational presence, there may be higher competition and wage pressure. For more rural areas, there may be less competition but concerns with underlying long-term demographics.

As a result, like for corporate work, no workforce analysis is done in a vacuum. For this analysis, the map at left shows the comparison markets used herein to benchmark MAIP against. These were selected to represent the types of communities MAIP is likely to compete against for new industrial investment. Some of these comparison markets are obvious regional competitors (e.g. Joplin, NW Ark.) while some are examples of competitive manufacturing markets from further afield (e.g. Augusta). Finally, SSG includes two "large" market comparisons (Midlothian on the edge of Dallas; Desoto County on the edge of Memphis), as theses are oftentimes the types of communities that companies can be attracted to with the advantages of a large market in one direction, and the advantages of being in a more rural setting in the other. While sheer labor availability and demographic indictors may look more favorable for these markets, we included them because they are exactly the type of markets MAIP is likely to compete with for investment.

### **SUMMARY OF MAIP WORKFORCE: STRENGTHS & CHALLENGES**

Category	Description	Key <u>MAIP</u> Strengths	Key <u>MAIP</u> Challenges
Population & Labor Force	Underlying population and labor force that drive workforce availability	<ul> <li>Strong historic and projected population growth.</li> <li>High labor force participation.</li> </ul>	Smaller sheer population and labor force size. compared to communities at the fringe of very large markets (e.g. Dallas, Nashville, Atlanta).
Target Demographics	Age, income and educational attainment and alignment with industrial requirements	<ul> <li>Very aligned demographics with the needs of most manufacturing requirements.</li> </ul>	? Lower proportion of people with a degree may be a challenge for very advanced projects.
Commuting	Realistic labor draw and commuting driving times	<ul> <li>Strong commuting pull in excess of 40 minutes.</li> <li>Particularly strong pull from rural areas north and east of MAIP.</li> </ul>	? Clear pull out of eastern suburbs of Tulsa (e.g. Broken Arrow) but some prospects may challenge how many people they can pull from Tulsa.
Production	Supply, demand, and wages for production workers including chemicals, metals, paper, etc.	<ul> <li>Extremely high concentration and presence of production workers across a variety of classifications.</li> <li>Very strong value proposition for direct labor.</li> </ul>	Potential for higher relative demand and competition for labor that could push up wages especially when energy markets are up.
Maintenance	Supply, demand, and wages for industrial maintenance workers	<ul> <li>✓ Strong concentration and presence of maintenance workers.</li> <li>✓ Relative demand more moderate than production.</li> </ul>	? Skilled maintenance workers are in short supply and high demand in every market
Engineering	Supply, demand, and salaries for engineers with an industrial & manufacturing focus	<ul> <li>Strong concentration of engineers in the labor shed and favorable growth trends.</li> </ul>	? While more anecdotal based on SSG's experience, convincing engineers and salary level talent to commute from Tulsa to MAIP could be a challenge.
Logistics	Supply, demand, and wages for blue and white collar logistics workers	<ul> <li>Favorable concentration and presence of blue collar logistic workers. Stronger concentration of white collar ones (e.g. clerks, logisticians, etc.)</li> </ul>	? Current data shows high relative demand, but SSG believes this is less of a concern compared to markets with major distribution operations.
Business & IT	Supply, demand, and wages for business (finance & accounting) and IT workers to support mfg.	<ul> <li>Moderate concentration and presence of these professional workers.</li> </ul>	? Typically a secondary concern, but access to this type of professional talent can drive projects to look at larger markets that have more supply.
Organized Labor	Overall organized labor rates and recent organization attempts	<ul> <li>Low unionization rate in the metro area and few recent organization attempts.</li> </ul>	Splitting hairs, but some southern markets have extremely low organized labor rates. Pockets of unions in greater Tulsa could concern some.
Workforce Training	Overall completions in key areas within a 1 hour drive of the site	<ul> <li>Very large number of precision production (metal working) and engineering technician completions in the greater region.</li> </ul>	? Lower number of degrees awarded in region for engineering. Important to lift up ability to attract recent grads from OSU, OU, and other regional insts.

# DEMOGRAPHICS

### Population



### Labor Force



#### **Population & Workforce Summary**

- The charts at left show simply the absolute number of people and the labor force within a 40 minute drive time of each comparison point.
- These figures show in part the challenge of competing with communities and sites on the edge of very large markets like Dallas. The sheer number of people and workers within a standard and reasonable 40 minute drivetime for places like Midlothian is very high.
- That being said, the data for MAIP look favorable as well, with more than 335,000 people within the same 40 minute laborshed. That number is comparable with other mid-size markets examined herein.

# **POPULATION & WORKFORCE INDICATORS**

### Working Age Population (15-64)



MAIP

#### Working Age Population Summary

- The chart at left show simply the absolute number of people ages 15-64 within a 40 minute drive time of each comparison point.
- This figure differs from the labor force number because labor force does not include those who are not currently seeking employment. Overall, MAIP is comparable with other mid-size markets with 213,959 people of working age within the laborshed.

#### Labor Force Participation Rate



### **Unemployment Rate**



#### Labor Force Participation Rate Summary

- Labor force participation can be a useful indicator of whether there is any potential "slack" remaining in a market and how much of the population is working.
- The labor force participation numbers for MAIP are very high, and are consistent with a region where people are actively engaged in the labor market rather than an area with high numbers of students or retirees.

#### **Unemployment Summary**

- The chart at left shows historical unemployment rates for each comparison location over the past five years.
- Up until this spring, the unemployment rate was becoming a less useful indicator, as it reached historically low levels across the country.
   Differentiating between multiple markets all with ultra-low unemployment rates became an exercise in splitting hairs as the data shows in the chart.
- As a result, we encourage MAIP and other stakeholders to carefully monitor unemployment rates throughout the next several months, knowing that there will be significant variance.

#### **Population Growth:** Historic (2010-2019) and Projected Growth (2019-2024)



### Age Breakdown with Median Age



#### **Population Summary**

- The figure at top right shows historic population growth (since 2010) and projected population growth over the next five years (to 2024).
- Historic and projected population growth in the MAIP labor shed are very favorable, and roughly aligned with the same growth in south Dallas suburbs like Midlothian. This strong growth is in part fueled by growth in the eastern portions of metro Tulsa in communities like Broken Arrow.

#### Age Summary

Median Age

- Companies place an increasingly large emphasis on locating in markets with a young, sustainable workforce. Whether explicitly looking for attractive markets for "millennials" or just markets that have long term demographic advantages, the age profile of a market can make a significant difference.
- The age profile of MAIP is generally favorable and in line with that in other communities. In SSG's view, a median age above 40 can be a warning sign of underlying demographic challenges, but that is not the case here.



#### Income Breakdown with Median Income



#### Educational Attainment: Population 25+

NW Arkansas	42%	21%	37%
Desoto Co., MS	39%	24%	36%
Augusta, GA	43%	22%	35%
Midlothian, TX	45%	21%	34%
Bradley Co., TN	46%	22%	32%
Hopkinsville, KY	45%	25%	30%
MAIP	46%	25%	29%
Joplin, MO	49%	24%	27%
Fort Smith, AR	52%	23%	25%
Ardmore, OK	54%	22%	24%
	■ HS & Below ■ Some C	College Degrees	

#### **Income Summary**

- Target income profiles can swing greatly by the type of requirement, with some companies wanting a higher income profile while some put more emphasis on moderate income levels as a proxy for skill and wage profiles.
- Median income levels in the MAIP labor shed again are right in the middle of the comparison areas and aligned with the requirements of mid- and high-skill manufacturing. We highlight those lower income brackets, as those categories can be most aligned with manufacturing workforce requirements.

#### **Educational Summary**

- Like on income profiles, the target educational profile of a community can vary considerably by the type of project. That being said, for a premier site having a higher share of individuals with degrees (associate's, bachelor's, and above) can be seen as more favorable.
- We highlight the proportion of people with a degree in the chart at left. MAIP trends a bit more toward the middle/bottom of comparison locations here, but is still generally aligned with needs of mid- and highskill industrial requirements.

# **COMMUTE ANALYSIS**

# **COMMUTING SUMMARY: MAIP**



### Key Commuting Drive Time Thresholds

	50 <sup>th</sup> Percentile	80 <sup>th</sup> Percentile
All Workers	22.8	41.3
Lower Wage Workers	21.5	36.3
Higher Wage Workers	23.0	42.1

#### <u>Summary</u>

- Every workforce analysis begins with a commuting and labor shed analysis to determine where an operation will draw the majority of its workers from.
- The table at left shows the travel times that workers employed in MAIP travel from their homes. For example, 50% of all workers travel 22.8 minutes or less, while 80% of low wage workers travel 36.3 minutes or less.
- SSG typically uses the 80<sup>th</sup> percentile as a key threshold to determine the reasonable commute radius around a site.
- Overall, the data show that a 40 minute drive time is a reasonable estimate to identify the labor shed surrounding MAIP.
- Further, there is a relatively small gap between commute thresholds between higher and lower earning workers. This is important as it demonstrates that whether hiring a entry-level production worker or a highly skilled engineer, the labor shed is going to be similar.



### Detailed Commuting Drive Time Distribution around MAIP

## **COMMUTING PATTERNS: MAIP**



### Where Workers Employed in MAIP Live



#### <u>Summary</u>

- The map here shows the block groups that individuals who work in MAIP tend to live. Darker shaded areas show block groups where there's a higher concentration of resident workers who work in MAIP.
- The map also overlays those key times shown in red (22.8 minutes for 50% of workers) and purple (41.3 minutes for 80% of workers).
- The data show a very strong pull to the north and east.
   While these are more rural areas, the data shows that
   MAIP gets a lot of its
   workforce from those more rural areas, and in some cases, exceed that ~40 minute commute threshold.
- At the same time, the data shows some commuting from the eastern suburbs of Tulsa from areas like Broken Arrow.
- Overall, the analysis shows a broad commute draw to MAIP, with a stronger pull from rural areas, while still retaining access to metro Tulsa.



#### Comparison Commuting Drive Time Thresholds (in minutes)

	<b>All Wages</b> (50 <sup>th</sup> percentile)	<b>All Wages</b> (80 <sup>th</sup> percentile)
NW Arkansas	19.3	29.0
Joplin, MO	17.8	30.7
Fort Smith, AR	20.5	33.8
Hopkinsville, KY	15.4	34.2
Bradley County, TN	18.4	34.8
Desoto County, MS	25.6	35.0
Augusta, GA	29.4	37.5
ΜΑΙΡ	22.8	41.3
Midlothian, TX	29.1	43.1
Ardmore, OK	27.7	47.7

#### <u>Summary</u>

- The table at left shows the same commuting data for all the comparison submarkets to give some relative sense for labor draw across the different markets. For most labor studies and corporate engagements, we typically assume a 35-45 minute commute draw for most communities.
- As the data shows, MAIP has one of the stronger commute draws compared to the other markets at 41.3 minutes, exceeded only by Midlothian and Ardmore (a smaller market which can typically have a wider labor draw).

# **OCCUPATIONAL** DYNAMICS



#### **Summary**

- The data below show presence, growth, and concentration statistics for the key occupational clusters examined herein within a 40 minute drivetime of MAIP. We highlighted the "blue collar" occupational clusters in light blue, and those more "white collar" clusters in white.
- Overall, the occupational data show an extremely strong concentration of occupational clusters critical for manufacturing and industrial requirements. For example, the table includes a dotted line at the national average for concentration. For all blue collar clusters, MAIP has a higher concentration of these workers compared to the national average, and oftentimes a much higher concentration. In summary, MAIP has a very strong sheer presence of critical skill sets for industrial operations.
- The data at far right show the same data but from a place of residence perspective that is, where these individuals actually live rather than just work. The most important takeaway from this data is that there is still an outflow of workers from that 40 minute labor shed who work in other parts of the Tulsa region (e.g. commuting from Claremore to Tulsa proper, or eastern parts of Broken Arrow). This emphasizes the continued opportunity to attract more workers who live in the labor shed to work at MAIP.

		OCCUPATIONAL PRESENCE							OCCUPATIONAL PRESENCE				
		(PLACE OF WORK)							(PLACE OF RESIDENCE)				
Occupational Cluster	2014 Jobs	2019 Jobs	% Growth (Historic)	2024 Jobs	% Growth (Projected)	2019 Location Quotient	Median Cluster Wages	2014 Workers	2019 Workers	% Growth (Historic)	2019 Location Quotient	Current Outflow	
Metal & Plastic Production	11,829	11,708	-1.02%	12,243	4.57%	2.22	\$18.65	6,752	6,481	-4.02%	0.99	-5,227	
All Production	19,169	19,930	3.97%	20,993	5.34%	2.00	\$17.57	11,505	11,396	-0.95%	5.82	-8,534	
Chemical Production	4,686	4,946	5.56%	5,259	6.33%	1.67	\$19.81	2,855	2,887	1.14%	0.83	-2,059	
Paper & Pulp Production	2,739	2,855	4.22%	3,037	6.39%	1.58	\$21.97	1,751	1,797	2.62%	1.50	-1,058	
Engineering	2,460	2,752	11.89%	3,236	17.56%	1.56	\$39.13	1,399	1,480	5.82%	6.96	-1,272	
Logistics - Support	2,319	2,505	8.02%	2,708	8.12%	1.50	\$20.28	1,290	1,428	10.67%	1.23	-1,077	
Maintenance	4,508	4,825	7.04%	5,233	8.45%	1.32	\$21.67	3,071	3,267	6.38%	1.35	-1,558	
Logistics - Material Moving	8,313	9,061	9.00%	9,454	4.33%	1.25	\$16.20	4,969	5,497	10.62%	1.15	-3,564	
Foundry Production	291	321	10.64%	318	-1.14%	1.00	\$17.92	258	268	3.93%	0.24	-53	
Business	6,155	6,587	7.02%	6,883	4.49%	0.98	\$27.09	4,141	4,158	0.41%	1.15	-2,429	
Information Technology	3,763	4,105	9.09%	4,500	9.63%	0.75	\$33.95	2,198	2,394	8.90%	0.20	-1,711	



#### **Summary**

• Comparing wages and salaries by market can be a tricky endeavor, as databases can vary greatly by how they estimate costs across markets. As a result, SSG leverages two different databases to estimate comparable wages and salaries. In our view, this gives a balanced approach that helps uncover whether markets are generally more or less expensive relative to one another.

- EMSI: This source leverages actual wage estimates by SOC code, but because job and skill requirements can vary by market and requirement it is not an exact comparison. For example, "welders" in a market where most applicable jobs require less skill is classified the same as a market where "welders" tend to have higher skill requirements, but it may appear that the latter has higher wages overall.
- ERI: This source estimates the wage for the exact same job, skill requirement, and tenure across markets, but takes a more modeled approach so is less based on actual wage levels. We use example job titles under each cluster in the below to show those differences.
- As shown in the table below, MAIP tends to have moderate wages compared to the other benchmark communities. Wages as calculated by EMSI tend to be a little higher, which could reveal the impact of higher skill requirements and/or the impact of the energy industry. A large, fast-growing market like Midlothian (Dallas) tends to consistently have higher wages.

	All Pro	duction	Chei Prodi	mical uction	Metal 8 Produ	k Plastic uction	Paper Produ	& Pulp uction	Foundry F	Production	Mainte	enance	Logi	stics	
MARKET	Median Cluster Wage (EMSI)	Ex. Machine Operator (ERI)	Median Cluster Salary (EMSI)	Ex. Chemical Operator (ERI)	Median Cluster Salary (EMSI)	Ex. CNC Operator (ERI)	Median Cluster Salary (EMSI)	Ex. Packaging Operator (ERI)	Median Cluster Salary (EMSI)	Ex. Foundry Worker (ERI)	Median Cluster Salary (EMSI)	Ex. Mntc. Mechanic (ERI)	Median Cluster Salary (EMSI)	Ex. Forklift Operator (ERI)	AVERAGE
Fort Smith, AR	\$12.88	\$17.83	\$13.14	\$21.09	\$13.26	\$17.98	\$13.18	\$14.48	\$13.48	\$16.51	\$19.09	\$22.66	\$15.85	\$15.78	\$15.47
NW Arkansas	\$13.49	\$18.38	\$14.06	\$22.17	\$14.44	\$18.62	\$13.65	\$15.09	\$15.86	\$17.10	\$20.07	\$23.95	\$17.80	\$16.70	\$16.38
Ardmore, OK	\$17.14	\$17.12	\$17.18	\$20.80	\$16.55	\$17.66	\$18.84	\$14.37	\$15.50	\$16.20	\$21.06	\$22.39	\$17.10	\$15.89	\$16.71
Desoto Co., MS	\$15.05	\$18.95	\$15.34	\$22.99	\$15.25	\$19.38	\$16.08	\$15.84	\$18.10	\$17.81	\$21.42	\$25.23	\$15.41	\$18.14	\$17.23
MAIP	\$18.37	\$16.82	\$19.81	\$20.83	\$18.65	\$17.28	\$21.97	\$14.37	\$17.92	\$15.87	\$21.67	\$22.63	\$16.20	\$15.54	\$17.37
Bradley Co., TN	\$15.45	\$18.34	\$16.63	\$22.13	\$16.77	\$18.71	\$16.68	\$15.28	\$20.31	\$17.22	\$22.20	\$24.34	\$15.72	\$17.32	\$17.39
Joplin, MO	\$15.63	\$17.88	\$17.69	\$21.75	\$16.50	\$17.70	\$18.45	\$14.91	\$25.76	\$16.23	\$19.39	\$22.92	\$17.59	\$16.00	\$17.40
Hopkinsville, KY	\$16.48	\$18.71	\$18.31	\$22.27	\$17.05	\$18.66	\$19.67	\$15.42	\$19.45	\$17.12	\$21.56	\$23.92	\$15.06	\$16.34	\$17.54
Midlothian, TX	\$15.61	\$19.10	\$17.05	\$23.71	\$16.61	\$19.46	\$16.60	\$15.96	\$16.01	\$17.81	\$22.15	\$26.32	\$16.74	\$17.75	\$17.70
Augusta, GA	\$17.35	\$19.02	\$20.76	\$23.45	\$17.18	\$19.41	\$19.47	\$15.92	\$19.17	\$17.78	\$21.85	\$25.00	\$13.55	\$16.61	\$17.95



#### **Summary**

- The summary below shows salary differences for the more white collar, or professional oriented occupational clusters analyzed herein. Again, we leverage the same data sources (with differing assumptions) to show which markets tend to have higher and lower salaries.
- Like on the wage or blue collar side, based on the data below, MAIP tends to have moderate wages compared to the other markets. Once again, the cluster based approach from EMSI tends to show slightly higher wages (which could be impacted from either higher skill requirements or the impact of the energy sector driving higher wages).
- But one thing is clear from both sources a market like Midlothian (Dallas) has much higher salary costs across both sources and all job clusters/titles compared to all other markets. This is the key tradeoff for companies considering locating in these larger markets – there may be more access to sheer population and target occupational clusters, but wages and salaries tend to be higher.

	Logistics Support		Engineering		IT Business Support		Support		
MARKET	Median Cluster Wage (EMSI)	Ex. Logistics Coordinator (ERI)	Median Cluster Salary (EMSI)	Ex. Mfg. Engineer (ERI)	Median Cluster Salary (EMSI)	Ex. IT Analyst (ERI)	Median Cluster Salary (EMSI)	Ex. Financial Analyst (ERI)	AVERAGE
Ardmore, OK	\$40,274	\$44,990	\$70,856	\$72,285	\$55,315	\$59,337	\$41,439	\$69,883	\$56,797
Joplin, MO	\$35,530	\$46,285	\$74,061	\$73 <i>,</i> 835	\$58,850	\$63,064	\$42,867	\$73,776	\$58,534
Fort Smith, AR	\$38,536	\$46,279	\$72,942	\$74,623	\$61,881	\$62,208	\$45,826	\$74,213	\$59,564
Hopkinsville, KY	\$44,526	\$47,663	\$74,437	\$76,473	\$63,672	\$63,150	\$45,205	\$73,805	\$61,116
MAIP	\$42,187	\$44,842	\$81,396	\$74,945	\$70,626	\$61,450	\$56,346	\$72,356	\$63,019
NW Arkansas	\$43,481	\$48,707	\$77,233	\$75 <i>,</i> 859	\$68,416	\$66,045	\$53,611	\$79,813	\$64,146
Bradley Co., TN	\$37,584	\$49,163	\$78,341	\$80,569	\$74,286	\$67,665	\$50,722	\$78,208	\$64,567
Desoto Co., MS	\$34,436	\$51,338	\$74,886	\$80,903	\$69,195	\$69,184	\$56,778	\$81,387	\$64,763
Augusta, GA	\$42,839	\$49,994	\$85,671	\$84,276	\$73,159	\$68,054	\$50,638	\$81,024	\$66,957
Midlothian, TX	\$40,639	\$54,033	\$93,151	\$90,174	\$91,505	\$77,680	\$67,383	\$90,374	\$75,617 🕈

# **SUPPLY: MANUFACTURING INDUSTRY**



#### Industry Presence: Overall count of workers



Industry Concentration: Greater than 1.00 means high concentration







#### Manufacturing Industry Presence Summary

- The chart at left shows the absolute number of workers in the manufacturing industry within the 40 minute drive time. We start here to show the overall presence of the manufacturing industry in the region.
- There are nearly 30,000 workers employed in manufacturing (across occupational types) within the MAIP labor shed.

#### Manufacturing Industry Concentration Summary

- The chart at left shows the concentration of workers in the manufacturing industry within the 40 minute drive time.
- Any concentration above 1.00 means there's a high concentration. With a concentration metric above 2.00, that means there is a significant amount of manufacturing concentration in the MAIP labor shed.
- Here and throughout the analysis, the data show the critical importance of focusing on both absolute presence <u>and</u> concentration. If only focusing on the former, locations like Midlothian look more favorable even if they don't have a strong specialization in the industry/occupation.

#### Manufacturing Industry Growth Summary

- The chart at left shows five years of historic growth trends and five years of projected growth for the manufacturing industry.
- Historical growth data show a dip from 2014 to 2017, which is likely impacted by energy-focused companies. However, in recent years that has rebounded. Projected growth for manufacturing in the region is very favorable, exceeded only by growth in Hopkinsville (near fast growing Clarksville and Nashville).

# **DEMAND: MANUFACTURING INDUSTRY**



#### Manufacturing Industry Demand Summary

- The chart at right shows the relative demand for workers in the manufacturing industry by comparing overall industry presence to job postings activity.
- Demand for workers overall in the manufacturing industry compared to industry presence is generally moderate compared to some of the other comparison locations. In later analyses, we'll show relative demand for specific occupational clusters of interest.

100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0% www.arkansas Bradleyco.,Th FortSmithAR Joplin, MO Desoto CO. MS Ardmore, 04 AUBUST<sup>2</sup> GA widothian It MAIP

#### Wage Growth: Nominal wage growth over the past 10 years



#### Manufacturing Industry Wages Summary

- The chart at right shows the growth in salaries for the manufacturing industry over the past ten years. The emphasis here is on the change over time rather than on absolute wage/salary levels.
- As the chart shows, overall wages and salaries in the manufacturing industry have risen over the last 10 years, with a larger jump in MAIP from 2017 to 2018, likely driven by growth in the energy sector.

**Demand:** Measure of hiring demand vs. occupational presence

# **SUPPLY: ALL PRODUCTION**



#### **Occupational Presence:** Overall count of workers



Occupational Concentration: Greater than 1.00 means high concentration







#### All Production Presence Summary

- The chart at left shows the absolute number of workers in the occupational cluster within the 40 minute drive time. This cluster includes all workers classified as production (SOC 51-0000).
- There are nearly 20,000 production workers in the labor shed.

#### **All Production Concentration Summary**

- The chart at left shows the concentration of workers in the occupational cluster within the 40 minute drive time.
- Like on the manufacturing industry side, the data show an extremely strong concentration of production workers in the labor shed, with a concentration of two times the national average.

#### All Production Growth Summary

- The chart at left shows five years of historic growth trends and five years of projected growth for the cluster.
- And once again like on the manufacturing side, the historical growth data shows a dip in the growth of production occupations from 2014 to 2017 with a sharp rebound. Growth projections show moderate occupational growth going forward.

## **DEMAND: ALL PRODUCTION**



#### All Production Demand Summary

- The chart at right shows the relative demand for workers in this occupational cluster by comparing overall occupational presence to job postings activity.
- Relative demand for production workers is high in the MAIP labor shed, exceeding that in the other comparison markets. While there is a very strong concentration of these types of workers in the region, there is also very high demand.

Demand: Measure of hiring demand vs. occupational presence



#### Wage Growth: Nominal wage growth over the past 10 years



#### All Production Wages Summary

- The chart at right shows the growth in salaries for this occupational cluster over the past ten years. Because each market has a unique mix of occupational presence within each cluster, the emphasis here is on the change over time rather than on absolute wage/salary levels.
- Supporting the demand data, the data show a strong rise in wages for production workers over the past decade.

# **SUPPLY: CHEMICAL PRODUCTION**



#### **Occupational Presence:** Overall count of workers



Occupational Concentration: Greater than 1.00 means high concentration







#### **Chemical Production Presence Summary**

- The chart at left shows the absolute number of workers in the occupational cluster within the 40 minute drive time. This includes production workers with a focus on chemical-oriented occupations.
- There are nearly 5,000 workers employed in specific chemical production jobs in the MAIP labor shed.

#### **Chemical Production Concentration Summary**

- The chart at left shows the concentration of workers in the occupational cluster within the 40 minute drive time.
- The concentration of this occupational clusters is very high, and well above national averages.

#### **Chemical Production Growth Summary**

- The chart at left shows five years of historic growth trends and five years of projected growth for the cluster.
- The historic and projected growth data for this occupational cluster shows a similar pattern as others – a historic dip, followed by a rebound and strong to moderate occupational growth projected going forward.

# **DEMAND: CHEMICAL PRODUCTION**



#### **Chemical Production Demand Summary**

- The chart at right shows the relative demand for workers in this occupational cluster by comparing overall occupational presence to job postings activity.
- The data show high levels of relative demand for chemical production workers compared to the other locations. In other words, that means that even with high occupational presence, there is a still a lot of demand and hiring.

**Demand:** Measure of hiring demand vs. occupational presence



#### Wage Growth: Nominal wage growth over the past 10 years



#### **Chemical Production Wages Summary**

- The chart at right shows the growth in salaries for this occupational cluster over the past ten years. Because each market has a unique mix of occupational presence within each cluster, the emphasis here is on the change over time rather than on absolute wage/salary levels.
- Wage levels for chemical production have risen steadily over the past decade.



#### **Occupational Presence:** Overall count of workers



Occupational Concentration: Greater than 1.00 means high concentration



### **Occupational Growth:** 5 Year Historic & Projected (2014 = 0)



#### Metal & Plastic Production Presence Summary

- The chart at left shows the absolute number of workers in the occupational cluster within the 40 minute drive time.
- There are nearly 12,000 workers in production occupations focused specifically on metal and plastics requirements (e.g. machining, CNC, welding, operators, etc.).

#### Metal & Plastic Production Concentration Summary

- The chart at left shows the concentration of workers in the occupational cluster within the 40 minute drive time.
- Of all the occupational clusters examined here, MAIP has the highest concentration of these types of workers.

#### Metal & Plastic Production Growth Summary

- The chart at left shows five years of historic growth trends and five years of projected growth for the cluster.
- The projected growth data show more muted growth in these occupations in the MAIP region compared to other occupational clusters.

# **DEMAND: METAL & PLASTIC PRODUCTION**

#### Metal & Plastic Production Demand Summary

- The chart at right shows the relative demand for workers in this occupational cluster by comparing overall occupational presence to job postings activity.
- Like other production-focused clusters, the data show high levels of relative demand for these types of metal and plastics production workers.

#### Metal & Plastic Production Wages Summary

- The chart at right shows the growth in salaries for this occupational cluster over the past ten years. Because each market has a unique mix of occupational presence within each cluster, the emphasis here is on the change over time rather than on absolute wage/salary levels.
- Wage data over the past decade show that MAIP tends to have higher wages for these types of occupations compared to other locations, which could be driven in part by high growth in the energy sector.





#### Wage Growth: Nominal wage growth over the past 10 years





# **SUPPLY: PAPER & PULP PRODUCTION**



#### **Occupational Presence:** Overall count of workers



Occupational Concentration: Greater than 1.00 means high concentration







#### Paper & Pulp Production Presence Summary

- The chart at left shows the absolute number of workers in the occupational cluster within the 40 minute drive time.
- This is a more specific occupational cluster with a smaller number of job codes included. Regardless, there are nearly 3,000 workers employed in these specific paper and pulp positions in the MAIP labor shed.

#### Paper & Pulp Production Concentration Summary

- The chart at left shows the concentration of workers in the occupational cluster within the 40 minute drive time.
- Again, MAIP has a strong concentration of these types of paper and pulp workers relative to the national average.

#### Paper & Pulp Production Growth Summary

- The chart at left shows five years of historic growth trends and five years of projected growth for the cluster.
- Projected growth data show favorable, positive growth for these types of occupations over the next five years.
- Of note, the chart shows a significant dip for DeSoto County (Memphis) from 2016 to 2018, which is likely either due to a major plant shut-down, or reclassification of occupations.

## **DEMAND: PAPER & PULP PRODUCTION**

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#### Paper & Pulp Production Demand Summary

- The chart at right shows the relative demand for workers in this occupational cluster by comparing overall occupational presence to job postings activity.
- While not quite as high as in other production-focused clusters, the relative demand for paper and pulp production workers in MAIP is comparatively high.



#### **Demand:** Measure of hiring demand vs. occupational presence

#### Wage Growth: Nominal wage growth over the past 10 years

### Paper & Pulp Production Wages Summary

- The chart at right shows the growth in salaries for this occupational cluster over the past ten years. Because each market has a unique mix of occupational presence within each cluster, the emphasis here is on the change over time rather than on absolute wage/salary levels.
- That elevated demand also reveals itself in an uptick in wage levels in MAIP, especially from 2017 to 2018.



# **SUPPLY: FOUNDRY PRODUCTION**



#### **Occupational Presence:** Overall count of workers



Occupational Concentration: Greater than 1.00 means high concentration







#### Foundry Presence Summary

- The chart at left shows the absolute number of workers in the occupational cluster within the 40 minute drive time. This clusters includes occupations like cluster pourers and casters, coremakers, and similar occupations found in a foundry.
- This is a very specific category with few component occupations. As a result, the data show only about 320 workers in the labor shed under these occupational codes.

#### Foundry Concentration Summary

- The chart at left shows the concentration of workers in the occupational cluster within the 40 minute drive time.
- From a concentration perspective, the data show MAIP has the exact same concentration of these types of workers compared to the nation overall.

#### Foundry Growth Summary

- The chart at left shows five years of historic growth trends and five years of projected growth for the cluster.
- While these occupations have grown historically, most markets (MAIP included) show a projected decline in this occupational cluster going forward.

# **DEMAND: FOUNDRY PRODUCTION**



#### Foundry Demand Summary

- The chart at right shows the relative demand for workers in this occupational cluster by comparing overall occupational presence to job postings activity.
- Relative demand for these types of foundry focused occupations is comparatively high in the MAIP laborshed.



#### **Demand:** Measure of hiring demand vs. occupational presence

#### Wage Growth: Nominal wage growth over the past 10 years



#### Foundry Wages Summary

- The chart at right shows the growth in salaries for this occupational cluster over the past ten years. Because each market has a unique mix of occupational presence within each cluster, the emphasis here is on the change over time rather than on absolute wage/salary levels.
- Wage data shows muted growth over the past decade until a slight uptick over the past two years.

### **SUPPLY: MAINTENANCE**



#### **Occupational Presence:** Overall count of workers



Occupational Concentration: Greater than 1.00 means high concentration







#### Maintenance Presence Summary

- The chart at left shows the absolute number of workers in the occupational cluster within the 40 minute drive time. This occupational cluster includes industrial mechanics, electricians, millwrights, and other key occupations. In SSG's experience, this occupational cluster is oftentimes the most difficult one to hire and retain.
- There are about 5,000 of these maintenance workers in the MAIP labor shed.

#### Maintenance Concentration Summary

- The chart at left shows the concentration of workers in the occupational cluster within the 40 minute drive time.
- In SSG's experience, this is an occupational clusters that does not vary significantly from one market to another. So a concentration statistic at 1.32 (well above the national average and those in almost all other markets), is actually very favorable.

#### Maintenance Growth Summary

- The chart at left shows five years of historic growth trends and five years of projected growth for the cluster.
- We see a slight historic dip in maintenance jobs from 2015 to 2017, and moderate growth moving forward.

## **DEMAND: MAINTENANCE**



#### Maintenance Demand Summary

- The chart at right shows the relative demand for workers in this occupational cluster by comparing overall occupational presence to job postings activity.
- Again, demand for these types of workers in SSG's experience is extremely high. But compared to other markets, the relative demand for MAIP is moderate, which is favorable.



#### **Demand:** Measure of hiring demand vs. occupational presence

#### Wage Growth: Nominal wage growth over the past 10 years



- The chart at right shows the growth in salaries for this occupational cluster over the past ten years. Because each market has a unique mix of occupational presence within each cluster, the emphasis here is on the change over time rather than on absolute wage/salary levels.
- MAIP tends to have higher wages for these types of positions, but they have not grown as quickly as in other markets.



## **SUPPLY: ENGINEERING**



#### **Occupational Presence:** Overall count of workers



Occupational Concentration: Greater than 1.00 means high concentration







#### Engineering Presence Summary

- The chart at left shows the absolute number of workers in the occupational cluster within the 40 minute drive time. This includes engineering and technician occupations with a focus on those required for manufacturing settings.
- The data show about 2,750 engineers in the labor shed.

#### **Engineering Concentration Summary**

- The chart at left shows the concentration of workers in the occupational cluster within the 40 minute drive time.
- From an occupational concentration perspective, MAIP has the highest concentration of these types of critical workers, well above all the other comparison markets.

#### **Engineering Growth Summary**

- The chart at left shows five years of historic growth trends and five years of projected growth for the cluster.
- Like manufacturing and production jobs, the data shows a historic dip connected to changes in the energy sector. The MAIP labor shed shows strong growth going forward.
- The spike and decline in historical growth for engineers is for the Augusta region, and could be caused by hiring/reclassification of engineers at the massive nearby Savannah River DoE site.

# **DEMAND: ENGINEERING**



#### **Engineering Demand Summary**

- The chart at right shows the relative demand for workers in this occupational cluster by comparing overall occupational presence to job postings activity.
- Unlike the production jobs, relative demand for engineering occupations is moderate in MAIP.



#### **Demand:** Measure of hiring demand vs. occupational presence

#### Wage Growth: Nominal wage growth over the past 10 years

### Engineering Wages Summary

- The chart at right shows the growth in salaries for this occupational cluster over the past ten years. Because each market has a unique mix of occupational presence within each cluster, the emphasis here is on the change over time rather than on absolute wage/salary levels.
- Wage and salary data for MAIP show a steady increase in salaries for engineers, following the trend for other markets.





#### **Occupational Presence:** Overall count of workers



Occupational Concentration: Greater than 1.00 means high concentration







#### Logistics – Material Moving Presence Summary

- The chart at left shows the absolute number of workers in the occupational cluster within the 40 minute drive time. This focuses on occupations like forklift drivers, picker/packers, and other logistics focused operations.
- It's no surprise that larger markets have a significantly larger share of these types of workers.

#### Logistics - Material Moving Concentration Summary

- The chart at left shows the concentration of workers in the occupational cluster within the 40 minute drive time.
- Again, a major distribution market like Memphis has an extremely high concentration of these types of occupations. Nevertheless, MAIP still has a higher-than-average concentration. In SSG's view, having a more moderate concentration of logistics workers can be favorable, as it means less competition from DC's to squeeze the market for industrial labor.

#### Logistics – Material Moving Growth Summary

- The chart at left shows five years of historic growth trends and five years of projected growth for the cluster.
- SSG would pitch the more moderate growth of logistics workers in the MAIP labor shed as a good sign, as it points to lower competition from these operations in the future.

# **DEMAND: LOGISTICS – MATERIAL MOVING**

#### Logistics – Material Moving Demand Summary

- The chart at right shows the relative demand for workers in this occupational cluster by comparing overall occupational presence to job postings activity.
- While SSG would present lower concentration and growth of logistics workers as an attractive asset, the relative demand data shows comparatively high current demand for these types of workers.
- This is an occupational clusters where looking at the change in demand over time may reveal additional information. The chart at right shows that data and demonstrates that absolute demand for logistics workers has trended lower in MAIP compared to the other markets.
- As a result, the supposed high relative demand is really caused by the lower presence/concentration of logistics workers in the MAIP region, rather than high absolute demand.

#### Logistics – Material Moving Wages Summary

- The chart at right shows the growth in salaries for this occupational cluster over the past ten years. Because each market has a unique mix of occupational presence within each cluster, the emphasis here is on the change over time rather than on absolute wage/salary levels.
- The growth in wages in MAIP mirrors that in other markets and falls towards the middle of the pack.





#### Demand Over Time: Change in hiring demand since 2016





#### Wage Growth: Nominal wage growth over the past 10 years

# **SUPPLY: LOGISTICS – SUPPORT**



#### **Occupational Presence:** Overall count of workers



Occupational Concentration: Greater than 1.00 means high concentration







#### Logistics – Support Presence Summary

- The chart at left shows the absolute number of workers in the occupational cluster within the 40 minute drive time. This cluster differs from the previous in that it focuses on more white collar, or administrative jobs within logistics like managers, logisticians, and other types of clerks.
- There are approximately 2,500 of these logistics support workers in the MAIP labor shed.

#### Logistics – Support Concentration Summary

- The chart at left shows the concentration of workers in the occupational cluster within the 40 minute drive time.
- Interestingly, the data shows a strong concentration of these types of workers in the MAIP region. In part, this is because these types of workers are found commonly in manufacturing facilities, verse the very high numbers of direct distribution workers (e.g. forklift, packers) that are found in higher numbers in distribution centers.

#### Logistics – Support Growth Summary

- The chart at left shows five years of historic growth trends and five years of projected growth for the cluster.
- The historic and projected growth for these types of occupations in the MAIP labor shed lags rates in other markets.

### **DEMAND: LOGISTICS – SUPPORT**

### Logistics – Support Demand Summary

- The chart at right shows the relative demand for workers in this occupational cluster by comparing overall occupational presence to job postings activity.
- Relative demand for these types of occupations is mostly consistent across markets, but is a bit elevated in MAIP.

#### Logistics – Support Wages Summary

- The chart at right shows the growth in salaries for this occupational cluster over the past ten years. Because each market has a unique mix of occupational presence within each cluster, the emphasis here is on the change over time rather than on absolute wage/salary levels.
- Further showing potential demand pressures, wages for these types of occupations have risen steadily in the MAIP region.

**Demand:** Measure of hiring demand vs. occupational presence



#### Wage Growth: Nominal wage growth over the past 10 years



# **SUPPLY: INFORMATION TECHNOLOGY**



#### **Occupational Presence:** Overall count of workers



Occupational Concentration: Greater than 1.00 means high concentration







#### Information Technology Presence Summary

- The chart at left shows the absolute number of workers in the occupational cluster within the 40 minute drive time. This sector includes all IT workers (regardless of industry), but we present it here as IT's importance for industrial project requirements continues to accelerate.
- The MAIP labor shed has about 4,100 of these IT workers, which pales in comparison to a large market like Midlothian (Dallas).

#### Information Technology Concentration Summary

- The chart at left shows the concentration of workers in the occupational cluster within the 40 minute drive time.
- With the exception of Midlothian, all these markets have relatively low concentrations of IT workers. As manufacturing becomes more sensitive to technological requirements, this is in part why many advanced manufacturing operations look for options nearer major markets where they can attract production, engineering, and IT talent.

#### Information Technology Growth Summary

- The chart at left shows five years of historic growth trends and five years of projected growth for the cluster.
- IT jobs are generally expected to grow nationwide, and the data shows that MAIP is no exception to that trend.

# **DEMAND: INFORMATION TECHNOLOGY**

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#### Information Technology Demand Summary

- The chart at right shows the relative demand for workers in this occupational cluster by comparing overall occupational presence to job postings activity.
- Even with lower presence of IT workers, relative demand for these skill sets is comparatively lower in MAIP compared to most other markets, but especially those large markets like Dallas and Memphis.

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#### **Demand:** Measure of hiring demand vs. occupational presence

#### Wage Growth: Nominal wage growth over the past 10 years



- market has a unique mix of occupational presence within each cluster, the emphasis here is on the change over time rather than on absolute wage/salary levels.
- Wages for IT workers has grown in MAIP, but pale in comparison to absolute rates in places like Midlothian (Dallas).



### **SUPPLY: BUSINESS**



#### **Occupational Presence:** Overall count of workers



Occupational Concentration: Greater than 1.00 means high concentration







#### **Business Presence Summary**

- The chart at left shows the absolute number of workers in the occupational cluster within the 40 minute drive time. This cluster includes all those business support roles like finance and accounting. While these occupations typically do not drive location decisions, they can influence decisionmakers concerned about having executive and support staff.
- There are about 6,600 of these types of workers in the MAIP labor shed.

#### **Business Concentration Summary**

- The chart at left shows the concentration of workers in the occupational cluster within the 40 minute drive time.
- The concentration of these types of finance and accounting workers is about inline with the national average.

#### **Business Growth Summary**

- The chart at left shows five years of historic growth trends and five years of projected growth for the cluster.
- Projected growth for these types of positions is modest in MAIP compared to some of the faster growing markets, like Midlothian (Dallas).



#### **Business Demand Summary**

- The chart at right shows the relative demand for workers in this occupational cluster by comparing overall occupational presence to job postings activity.
- Relative demand for these business focused finance and accounting jobs is relatively low in MAIP compared to the other markets.



#### **Demand:** Measure of hiring demand vs. occupational presence

#### Wage Growth: Nominal wage growth over the past 10 years



#### **Business Wages Summary**

- The chart at right shows the growth in salaries for this occupational cluster over the past ten years. Because each market has a unique mix of occupational presence within each cluster, the emphasis here is on the change over time rather than on absolute wage/salary levels.
- Salary levels have grown in the MAIP labor shed but trail those in much larger markets like Midlothian (Dallas).



#### **Organized Labor Summary**

- The table below shows private organized labor rates across all the comparison metro areas examined herein for the past five years. Data is not available for all metropolitan statistical areas, and as a result, it is not shown for smaller markets like Ardmore and Joplin.
- Overall, all these benchmark locations have relatively low organized labor rates, as do most markets in the southern United States. Tulsa's rate has hovered right around 4.0% over the past five years. While there are some markets that have extremely low rates (e.g. markets in Arkansas) there is really not a significant difference between these markets. As a result based on this data, SSG would categorize the presence of organized labor in the market as low.



### Private Unionization Rates (Past Five Years)



#### **Organized Labor Summary**

- We further examine the presence of organized labor by reviewing organization attempts over the past five years, via filings with the National Labor Relations Board. This data shows how many attempts to organize have occurred within the same labor shed used previously.
- Overall, its no surprise that few of these markets have seen many organization attempts in the past five years, MAIP included. For these smaller and mid-size markets in the southern U.S., there is little threat of ongoing organization activity.
- However, even in the southern part of the county, larger more densely populated areas can have more organization activity. For example, the data for the area surrounding Midlothian shows a much larger number of overall and successful filing attempts compared to the other markets. While SSG would not consider Dallas (or Texas) a hotbed of organized labor activity, compared to other markets, it may be a slight disadvantage.

### Organization Attempts (Past Five Years within 40 Minutes)

	ALL FILINGS			CESSFUL ELEC	TIONS RESULTING RESENTATION	CURRENT OPEN FILINGS		
MARKET	Count of Filings	Count of Affected Employees		Count of Successful Elections	Count of Affected Employees	Count of Open Elections	Count of Affected Employees	
Fort Smith, AR	1	10		0	0	1	10	
NW Arkansas	2	86		0	0	0	0	
Ardmore, OK	1	10		1	10	0	0	
Joplin, MO	4	250		1	6	0	0	
MAIP	5	84		3	76	0	0	
Augusta, GA	12	841		8	619	0	0	
Hopkinsville, KY	17	531		10	273	0	0	
Desoto Co., MS	29	2,463		13	840	3	620	
Midlothian, TX	79	10,258		24	1,649	0	0	

# WORKFORCE TRAINING

# ENGINEERING & ENG. TECHNICIAN COMPLETIONS

#### Engineering Degree Completions: Most Recent Year (2018)



### Engineering Degree Completions: Last 10 Years



#### Engineering Degree Completions Summary

- The figures above show engineering <u>degree</u> completions within a broader 60 minute drive time of each site.
- As part of a larger metro area, the number of engineering degrees issued in Midlothian is much higher, as it is in locations with a large university (e.g. Univ. of Arkansas). However, compared to the other smaller markets listed here, the number of engineering degrees in the MAIP region is moderate, but growing.

#### Engineering Technician Completions: Most Recent Year (2018) 914 469 469 469 469 469

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Midlothian

### Engineering Technician Completions: Last 10 Years

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#### Engineering Technician Completions Summary

- The figures above show all engineering <u>technician</u> completions within a broader 60 minute drive time of each site.
- The MAIP region has a very large number of engineering technician completions, trailing only Midlothian (Dallas) which has a significantly larger population.
- A large share of these engineering technician completions are driven by aerospace related programs at Spartan College, although there are a fair number from Tulsa Tech, Univ. of Tulsa, Tulsa Community College, and Rogers State.

# **PRODUCTION & MAINTENANCE COMPLETIONS**

#### Precision Production Completions: Most Recent Year (2018)



Precision Production Completions: Last 10 Years



#### **Precision Production Completions Summary**

- The figures above show all precision production completions within a broader 60 minute drive time of each site. This includes completions in areas like machining, welding, and similar.
- MAIP (and the greater Tulsa region) show a very large number of completions in this category, which is very favorable for growing the industrial workforce. This captures completions from institutions like Northeast Technology Center, Tulsa Tech, and private schools like Tulsa Welding School.



#### Maintenance Completions: Most Recent Year (2018)

### Maintenance Completions: Last 10 Years



#### Maintenance Completions Summary

- The figures above show all maintenance completions within a broader 60 minute drive time of each site. This includes programs like industrial maintenance, electric, and HVAC.
- While the number of completions in MAIP trails those in a much larger market like Midlothian, they are still higher than all others, DeSoto/Memphis included. These positions tend to be in very high demand, so showing a large number of these completions is important to growing the workforce pipeline.

# APPENDIX

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### **OCCUPATIONAL CLUSTER DEFINITIONS**

PRODUCTION WORKERS (OVERALL)
SOC Description
51-0000 Production Workers

	PAPER/PULP PRODUCTION
SOC	Description
51-9196	Paper Goods Machine Setters, Operators, and Tenders
51-9198	HelpersProduction Workers
51-1011	First-Line Supervisors of Production and Operating Workers
51-5112	Printing Press Operators
51-9032	Cutting and Slicing Machine Setters, Operators, and Tenders
51-9111	Packaging and Filling Machine Operators and Tenders

	CHEMICAL PRODUCTION
SOC	Description
51-1011	First-Line Supervisors of Production and Operating Workers
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic
51-6091	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers
51-8091	Chemical Plant and System Operators
51-8092	Gas Plant Operators
51-8099	Plant and System Operators, All Other
51-9011	Chemical Equipment Operators and Tenders
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers
51-9111	Packaging and Filling Machine Operators and Tenders
51-9121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders
51-9192	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders
51-9198	HelpersProduction Workers
51-9199	Production Workers, All Other

ME	TAL & PLASTIC-FOCUSED PRODUCTION
soc	Description
51-1011	First-Line Supervisors of Production and Operating Workers
51-2041	Structural Metal Fabricators and Fitters
51-2098	Assemblers and Fabricators, All Other, Including Team Assemblers
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic
51-4041	Machinists
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic
51-4111	Tool and Die Makers
51-4121	Welders, Cutters, Solderers, and Brazers
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers
51-9121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders
51-9198	HelpersProduction Workers
51-9199	Production Workers, All Other

## **OCCUPATIONAL CLUSTER DEFINITIONS – CONT.**

#### MAINTENANCE

SOC	Description
47-2111	Electricians
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment
49-9041	Industrial Machinery Mechanics
49-9043	Maintenance Workers, Machinery
49-9044	Millwrights
49-9051	Electrical Power-Line Installers and Repairers
49-9071	Maintenance and Repair Workers, General

FOUNDRY		
SOC	Description	
51-4052	Pourers and Casters, Metal	
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	
51-4071	Foundry Mold and Coremakers	
51-8013	Power Plant Operators	
51-9011	Chemical Equipment Operators and Tenders	

ENGINEERING		
SOC	Description	
11-3051	Industrial Production Managers	
11-9041	Architectural and Engineering Managers	
17-2041	Chemical Engineers	
17-2071	Electrical Engineers	
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	
17-2112	Industrial Engineers	
17-2131	Materials Engineers	
17-2141	Mechanical Engineers	
17-3013	Mechanical Drafters	
17-3023	Electrical and Electronics Engineering Technicians	
17-3024	Electro-Mechanical Technicians	
17-3025	Environmental Engineering Technicians	
17-3026	Industrial Engineering Technicians	
17-3027	Mechanical Engineering Technicians	
17-3029	Engineering Technicians, Except Drafters, All Other	

LOGISTICS – MATERIAL MOVING (BLUE COLLAR)		
SOC	Description	
53-1048	First-line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	
53-7011	Conveyor Operators and Tenders	
53-7051	Industrial Truck and Tractor Operators	
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	
53-7063	Machine Feeders and Offbearers	
53-7064	Packers and Packagers, Hand	
53-1048 53-7011 53-7051 53-7062 53-7063 53-7064	Material Moving Workers, Except Aircraft Cargo Handling SupervisorsConveyor Operators and TendersIndustrial Truck and Tractor OperatorsLaborers and Freight, Stock, and Material Movers, HandMachine Feeders and OffbearersPackers and Packagers, Hand	

LOGISTICS – SUPPORT (WHITE COLLAR)		
SOC	Description	
11-3071	Transportation, Storage, and Distribution Managers	
13-1081	Logisticians	
43-3061	Procurement Clerks	
43-5011	Cargo and Freight Agents	
43-5061	Production, Planning, and Expediting Clerks	
43-5071	Shipping, Receiving, and Traffic Clerks	

### **OCCUPATIONAL CLUSTER DEFINITIONS – CONT.**

#### IT WORKERS

SOC	Description
11-3021	Computer and Information Systems Managers
15-1111	Computer and Information Research Scientists
15-1121	Computer Systems Analysts
15-1122	Information Security Analysts
15-1131	Computer Programmers
15-1132	Software Developers, Applications
15-1133	Software Developers, Systems Software
15-1134	Web Developers
15-1141	Database Administrators
15-1142	Network and Computer Systems Administrators
15-1143	Computer Network Architects
15-1151	Computer User Support Specialists
15-1152	Computer Network Support Specialists
15-1199	Computer Occupations, All Other
15-2021	Mathematicians
15-2031	Operations Research Analysts
15-2041	Statisticians
17-2061	Computer Hardware Engineers
43-9011	Computer Operators

BUSINESS SUPPORT		
SOC	Description	
13-2011	Accountants and Auditors	
15-2011	Actuaries	
43-3031	Bookkeeping/Accounting/Auditing Clerks	
13-2031	Budget Analysts	
13-2041	Credit Analysts	
13-2051	Financial Analysts	
13-2061	Financial Examiners	
11-3031	Financial Managers	
13-2099	Financial Specialists, All Other	
41-3031	Securities, Commodities & Financial Services Sales Agents	
13-2081	Tax Examiners and Collectors, and Revenue Agents	
13-2082	Tax Preparers	
19-3011	Economists	
13-1041	Compliance Officers	
13-1111	Management Analysts	
13-2051	Financial Analysts	
15-2021	Mathematicians	
15-2031	Operations Research Analysts	
15-2041	Statisticians	



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