The Association of Union Constructors

The Voice For Union Construction and Maintenance

UNION LABOR SUPPLY SURVEY

2016

"Measuring Today for a Successful Tomorrow"

INTRODUCTION

The **2016 TAUC Union Labor Supply Survey** marks the second year that **The Association of Union Constructors (TAUC)** has commissioned the **Construction Labor Research Council (CLRC)** to conduct a comprehensive analysis of the current state of the Union Construction and Maintenance Industry. The first study was completed in 2015. Copies of the previous year's report can be obtained by contacting TAUC.

The Association of Union Constructors (TAUC)

The Association of Union Constructors (TAUC) is the premier national trade association for the union construction and maintenance industry. Membership is comprised of more than 2,000 contractors who utilize union labor for their projects, as well as local contractor associations and vendors in the industrial maintenance and construction industries. TAUC's mission is to act as an advocate for union contractors and to enhance cooperation between the three entities involved in the successful completion of construction and maintenance projects: the union, the contractor, and the owner/client (the company for which the work is being completed). **TAUC's ultimate goal: to demonstrate that union construction and maintenance is the best option because it's safer, more productive and provides a higher quality, cost-competitive product.**

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Construction Labor Research Council (CLRC)

The Construction Labor Research Council (CLRC) is the nation's foremost source of labor cost and related information for the unionized sector of the construction industry. It serves as a key resource for data on labor costs, workforce issues, market share, labor contract terms, safety, and associated topics. The CLRC database contains wages, fringe benefits and contract language information on nearly 3,000 contracts in 285 cities for 17 crafts. CLRC is supported by management associations whose member firms employ union construction craft workers.

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EXECUTIVE SUMMARY & KEY FINDINGS

The 2016 Union Labor Supply Survey was conducted by The Association of Union Constructors (TAUC) in conjunction with the Construction Labor Research Council (CLRC). This is the **ONLY** union-specific study focusing on construction and maintenance. The findings will help create a detailed, **data-driven** picture of the current state of the labor supply throughout the United States.

TAUC launched the Union Labor Supply Survey in 2015 (you can read the full results and download a free copy of last year's survey report by clicking here). It received a tremendous response from a wide cross-section of the entire industry – nearly 1,000 contractors, labor representatives, owner-clients and construction association representatives completed the survey.

This year's survey has been enhanced based on feedback from last year's respondents. You asked for more data, and we heard you! The 2016 Union Labor Supply Survey drills down even further into the specifics of both regional and national labor supply trends. Our goal is to provide the industry with an even more robust set of metrics. TAUC and its partners in labor believe that a data-driven approach is the only way to achieve our shared goals of planning for the future and increasing union market share.

Study Focus

This study covers the following topics:

- Overall growth in construction and maintenance work opportunities (union and nonunion)
- Labor supply for union craft workers overall and for 14 specific unions, covering:
  - Recent history
  - Projections for 2016
  - Apprentice levels
- Time taken to fill union craft labor needs

Key Features

A number of features make this study a timely and useful resource for those interested in the construction and maintenance industry.

- The population from which the large sample (N=792) was drawn is knowledgeable and engaged regarding the topic of craft labor supply.
- Respondents were instructed to describe their own experiences, not their perceptions of others' experiences or what they may have read, which should enhance the validity of the results.
- Thorough and detailed analyses of the data were conducted.
- A large amount of craft-by-craft specific results are presented in the body and appendix of the report.
- Detailed analyses, including data cuts by the four demographic variables (i.e., role, industry, region, organization size), are presented throughout the report.
- Many charts and graphs are included to make interpretation of the findings easy and accurate.

Sample Demographics

The demographic characteristics of the sample are shown in the tables below for the following categories:

- Respondent role
- Industry
- Geographic region
- Organization size

	Percent of Sample	
Role	**2015**	**2016**
Association	11%	2%
Construction Manager	5%	2%
Contractor/Sub	44%	45%
Owner/Client	3%	4%
Union/Labor Representative	33%	46%
Other	4%	1%
Total	**100%**	**100%**

	Percent of Sample	
Industry	**2015**	**2016**
Civil	5%	3%
Commercial	41%	43%
Manufacturing	17%	16%
Petro/Natural Gas/Chemical	13%	13%
Utility	18%	20%
Other	6%	5%
Total	**100%**	**100%**

	Percent of Sample	
Region	**2015**	**2016**
New England	3%	12%
Middle Atlantic	19%	19%
Southeast	6%	14%
East North Central	48%	30%
West North Central	8%	9%
South Central	5%	5%
Mountain Northern Plains	3%	4%
Northwest	3%	3%
Southwest	6%	5%
Total	**100%**	**100%**

Organization Size	Percent of Sample
	2016
1-25	10%
26-100	12%
101-500	30%
501-1,000	14%
1,001-5,000	15%
5,001-10,000	4%
More than 10,000	15%
Total	**100%**

SUMMARY & KEY FINDINGS

1. Management vs. Labor

The results clearly show that management (i.e., association representatives, construction managers, contractors/subcontractors, owner/clients) had much less positive or optimistic evaluations than union/labor representatives. This was true for:

1) Overall construction and maintenance growth projections **(see Section II, Exhibit 2.3)**,
2) Union craft labor supply **(see Section III, Exhibit 3.2),**
3) Time taken to fill union craft jobs **(see Section III, Exhibits 3.7-3.10)** and
4) A large percent of the craft specific analyses **(Section VI, Exhibits 6.1-6.42)**.

Stated differently, the union/labor contingent was the most positive about growth prospects, the least concerned about union craft labor shortages and rated the time lapse in filling union craft jobs the shortest. This theme was one of the most prominent throughout the study, and often the differences among the management roles and the union/labor role were large enough to achieve statistical significance ($p<.05$).

2. Growth in Construction and Maintenance Work Opportunities

Projections for growth in construction and maintenance work opportunities were still present in over half of the sample, but the optimism was tempered among some for 2016 compared to 2015. Even so, a plurality of respondents thought there would be very strong growth in 2016, so there was greater diversity in opinions about growth in work opportunities this year than last year.

3. Union Craft Labor Supply

The union craft labor supply, the crux of the study, showed about an even split between those who thought there was a shortage (52%) and those who thought there was not (i.e., either there was a surplus or the union craft labor supply in their organization was the right size).

About a fourth (23%) of the respondents reported a shortage of at least 4% in their organization. Carpenters, Plumbers/Pipefitters/Steamfitters and Electricians exhibited the largest shortage pervasiveness. Teamsters had the smallest percent of respondents reporting a shortage in their organization. Only three crafts—Boilermakers, Carpenters and Iron Workers—had a smaller reported shortage in 2016 than in 2015.

These results beg the questions: How do these results for the current time period (2015 and 2016) compare to other time periods? Are these results to be interpreted as benign, somewhat concerning or alarming? What are "normal" or baseline results to which these data can be benchmarked?

Since this is only the second year for this report, answers to those questions are not fully available. However, within a few short years trends will emerge and clearer answers to these questions will be available. Moreover, a surplus can be problematic. Therefore, some sort of union craft labor supply issue or "problem" exists for well over half of the sample, whether it be a large or small shortage, or a surplus (Only 32% said their union craft labor staffing level was the right size.).

4. Industry Differences

The largest industry represented by far, commercial/institutional, had the second highest growth projections and the lowest worker shortage ratings. This suggests "better" health for this industry, relatively speaking, compared to the other industries. That does not mean individual organizations will not experience labor supply challenges, just that they may be less likely in the commercial/institutional sector than in other industries. Results for the second largest industry reported in the sample, utility, were somewhat counterintuitive in that low growth was projected yet it also carried the largest worker shortage evaluations for 2015.

5. Regional Variation

The greatest growth was projected for three of the four corners of the United States: New England, the Southeast and the Northwest. New England and the Southeast had elevated concerns regarding staffing levels compared to other regions; thus, combined with their stronger growth expectations, those regions may be expected to have some of the strongest challenges meeting union labor craft supply needs. The Northwest region had the fewest concerns (compared to the other regions) regarding adequate staffing, so that provides some labor supply relief since good growth was also projected there. The low growth prospects for the largest region, the East North Central region, were met with lower shortage ratings as well, so labor supplies may be less stressed there than other regions.

STUDY RESULTS

I. Sample Demographics

A questionnaire focusing on the craft labor supply in the construction and maintenance industry was emailed to approximately 5,892 construction and maintenance professionals in the TAUC database on January 18, 2016. A total of 792 individuals responded, representing a variety of roles in their organizations, industries, and geographic regions. The demographic characteristics of the respondent sample are shown in the following section.

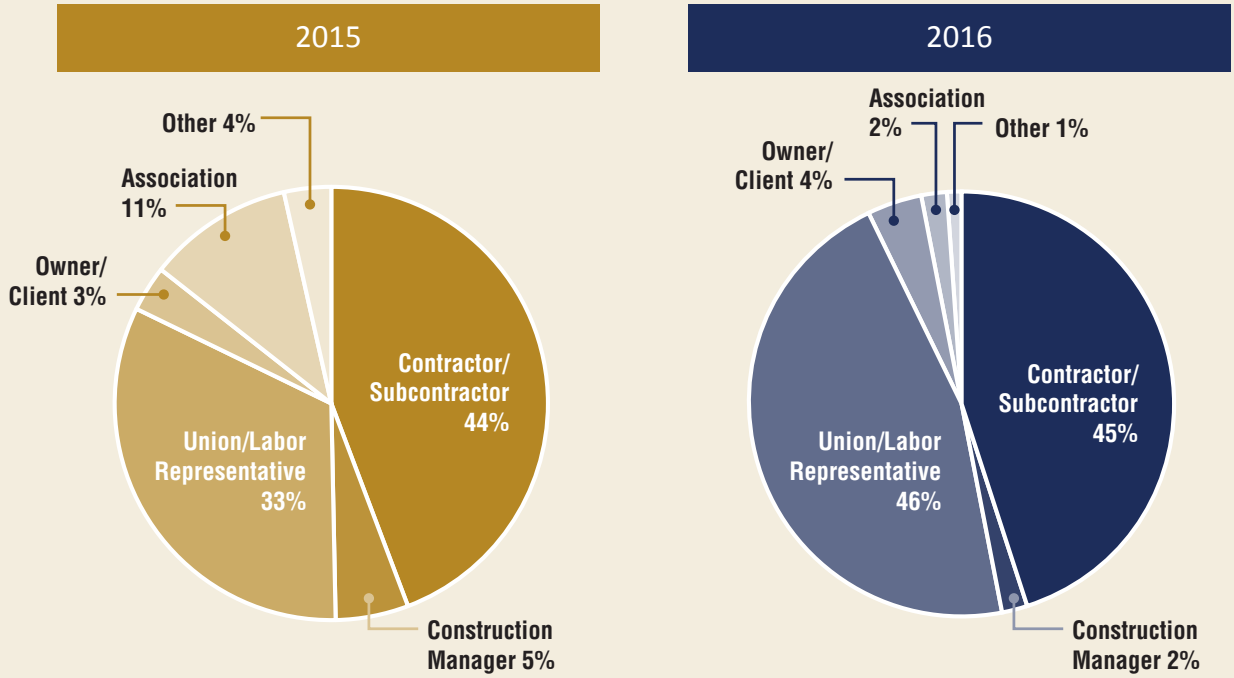
As shown in **Exhibits 1.1 and 1.2**, in 2016 the largest proportion of respondents was from the union/labor representative role (46%) with contractors/subcontractors a close second (45%). These were also the most populous categories in 2015, but with the order reversed and a noticeably smaller percent in the union/labor category (contractors/subcontractors 44%, union/labor 33%).

The percent of respondents who were not in either of these categories fell from 23% in 2015 to 9% in 2016.

Exhibit 1.1
Respondent role table

	Percent of Sample	
Role	**2015**	**2016**
Association	11%	2%
Construction Manager	5%	2%
Contractor/Sub	44%	45%
Owner/Client	3%	4%
Union/Labor Representative	33%	46%
Other	4%	1%
Total	**100%**	**100%**

Exhibit 1.2
Respondent role charts



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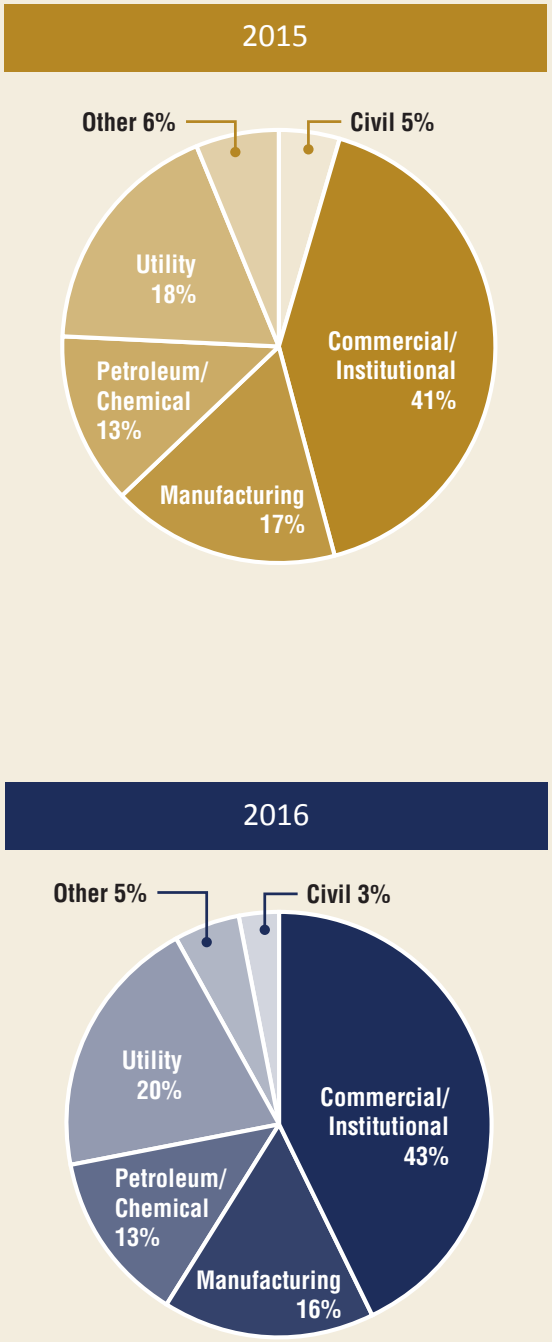
Exhibits 1.3 and 1.4 display how each industry sector was represented in the data. The commercial/institutional industry sector was again the most common one in 2016, representing 43% of the responses (41% in 2015). Manufacturing, petroleum/natural gas/chemical and utility were represented by 13% to 20% of the data in both 2015 and 2016. The final industry sector, civil, represented 5% and 3% of the data in 2015 and 2016, respectively.

Exhibit 1.3
Industry type table

	Percent of Sample	
Industry	**2015**	**2016**
Civil	5%	3%
Comm/Institution	41%	43%
Manufacturing	17%	16%
Petro/Nat Gas/Chem	13%	13%
Utility	18%	20%
Other	6%	5%
Total	**100%**	**100%**

Exhibit 1.4
Industry type charts



The region with a strong plurality of responses was the East North Central region in both 2015 (48%) and 2016 (30%), as illustrated in **Exhibits 1.5 and 1.6**. While this region represented nearly half of the results in 2015, it declined to less than a third in 2016, allowing for a stronger representation of other geographic areas such as the Middle Atlantic (19%), Southeast (14%) and New England (12%). All other regions had a single digit percent of the responses.

Exhibit 1.5

Region table

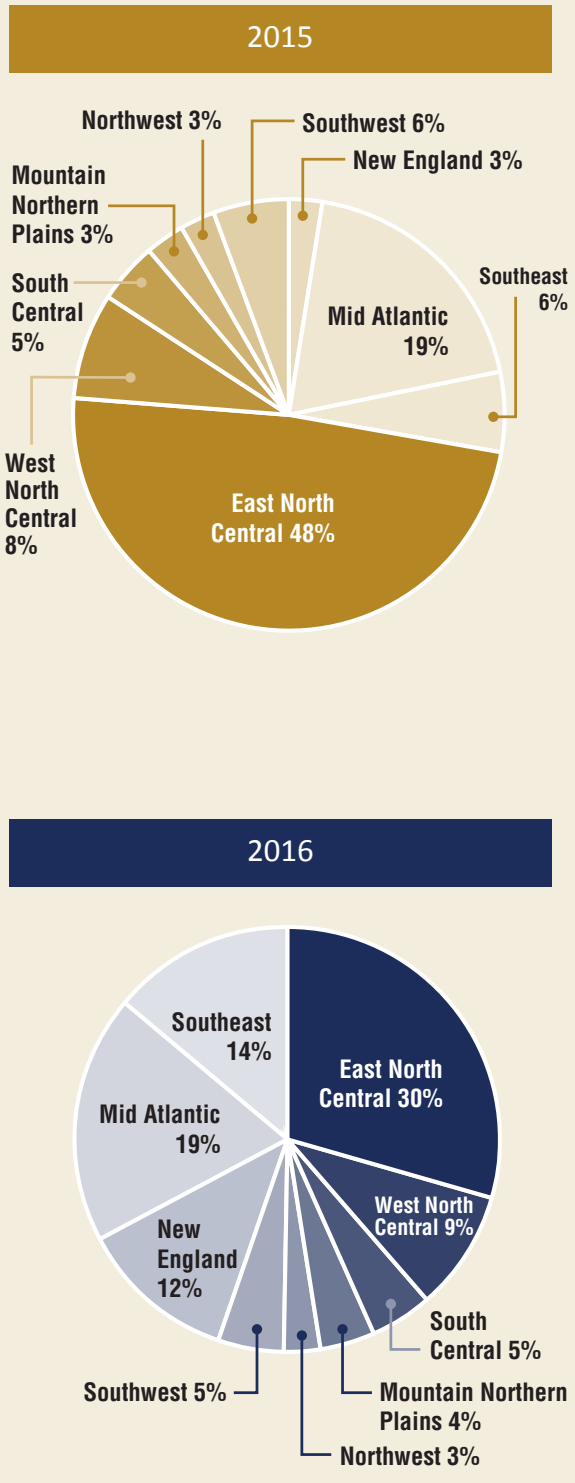
	Percent of Sample	
Region	**2015**	**2016**
New England	3%	12%
Middle Atlantic	19%	19%
Southeast	6%	14%
East North Central	48%	30%
West North Central	8%	9%
South Central	5%	5%
Mountain Northern Plains	3%	4%
Northwest	3%	3%
Southwest	6%	5%
Total	**100%**	**100%**

Regions:

New England: CT, MA, ME, NH, RI, VT. **Middle Atlantic**: DC, DE, MD, NJ, NY, PA. **Southeast**: AL, FL, GA, KY, MS, NC, SC, TN, VA. **East North Central**: IL, IN, MI, MN, OH, WI, WV. **West North Central**: IA, KS, MO, NE. **South Central**: AR, LA, NM, OK, TX. **Mountain Northern Plains**: CO, MT, ND, SD, UT, WY. **Northwest**: AK, ID, OR, WA. **Southwest Pacific**: AZ, CA, HI, NV.

Exhibit 1.6

Region charts



New for 2016, **Exhibits 1.7 and 1.8** display the distribution of respondents by organization size. The most common sized organization was 101-500 employees and the least common size was 5,001-10,000 employees. Generally speaking, most organization sizes were well represented in the results.

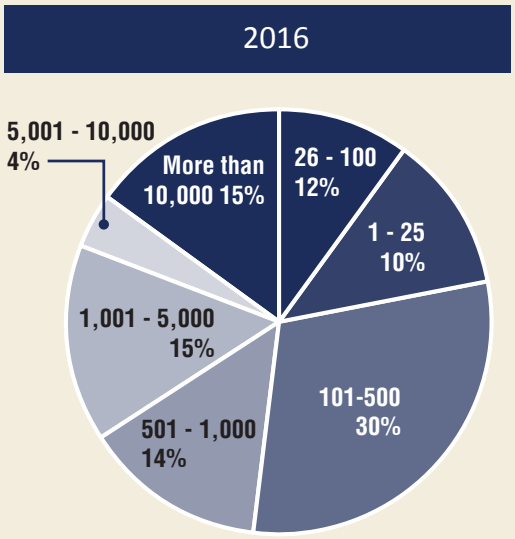
Exhibit 1.7

Organization size table

	Percent of Sample
Organization Size	**2016**
1-25	10%
26-100	12%
101-500	30%
501-1,000	14%
1,001-5,000	15%
5,001-10,000	4%
More than 10,000	15%
Total	**100%**

Exhibit 1.8

Organization size chart



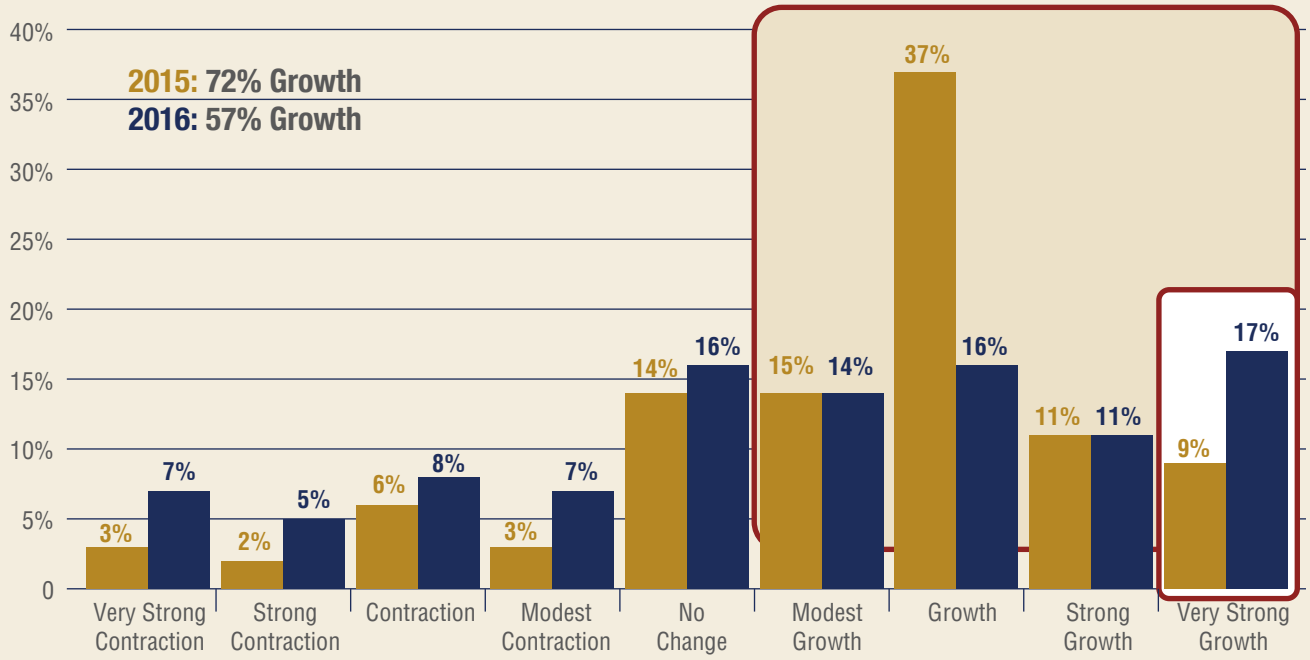
II. Projected Growth/Contraction in Construction & Maintenance Work Opportunities

Exhibit 2.1 shows how respondents see the growth/contraction prospects for 2015 and 2016 by intensity level (e.g., contraction, modest growth, strong growth). These results relate to all construction and maintenance work, union and otherwise. The exhibit shows the percent of the sample endorsing each response option.

There was a decline of 15% from last year in overall growth projections. Specifically, as reported in early 2015 (last year's report), 72% projected growth for 2015; in early 2016 (this year's report), 57% projected growth for 2016. Interestingly, in 2016, 17% said they anticipated "very strong growth" (10% or more), which is nearly double the 2015 rate of 9% of the respondents. Thus, although overall there were fewer projecting growth for 2016 than there were in 2015, there was a substantial subset that projected very strong growth for 2016.

Exhibit 2.1

Detailed overall growth/contraction projections in construction and maintenance work opportunities: 2015 vs 2016

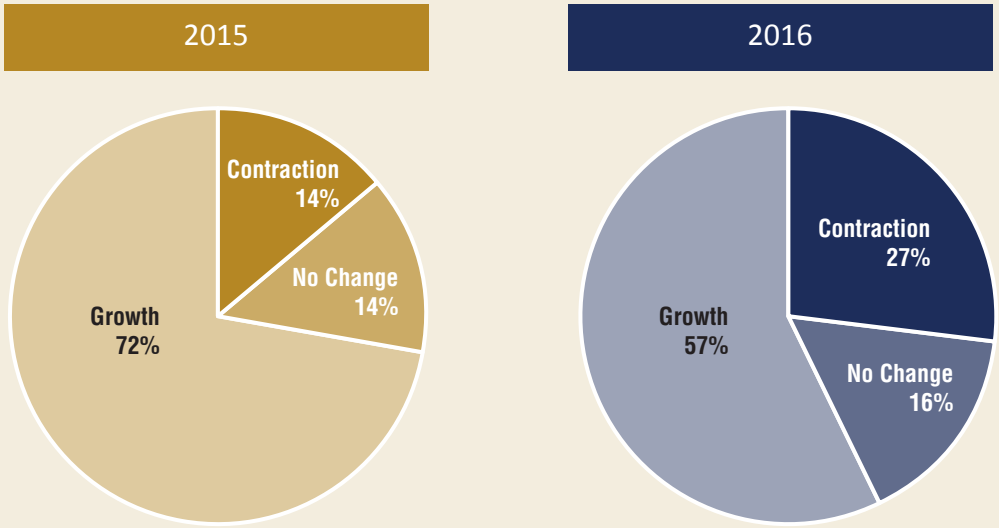


Very Strong Contraction = -10% or greater; **Strong Contraction** = -7% to -9%; **Contraction** = -4% to -6%; **Modest Contraction** = -1% to -3%; **No Change** = 0%; **Modest Growth** = 1% to 3%; **Growth** = 4% to 6%; **Strong Growth** = 7% to 9%; Very Strong Growth = 10% or greater.

As summarized in **Exhibit 2.2**, the proportion of respondents who project growth fell in 2016 and the proportion who project contraction increased. More specifically, in 2015 the ratio of growth to contraction was 5:1 and in 2016 the ratio was much less, 2:1. In other words, in 2015 for every rater anticipating contraction that year there were five anticipating growth. In 2016 there were just two raters anticipating growth for each one anticipating contraction, meaning overall there is noticeably less optimism about overall growth in construction and maintenance work for 2016.

Exhibit 2.2

Overall growth/contraction projections in construction and maintenance work opportunities: 2015 vs 2016



Survey participants were also asked how long they anticipated the growth/contraction (whichever they chose) to last. The average time period was 3.1 years. Interestingly, generally speaking, the stronger the projection—whether for growth or contraction—the longer the respondent thought it would last. For example, the average time period for those that projected 2% growth was 2.6 years while the average time period for those that projected 8% growth was 3.6 years.

Exhibits 2.3-2.7 show the results for overall growth/contraction **(Exhibit 2.1)** by four data cuts: role, industry, region and organization size. The bars represent the percent of the sample providing each rating, not the actual percent of growth/contraction.

In **Exhibit 2.3**, the results regarding growth projections for 2016 are shown by respondent role. Results for three roles—construction manager, contractor/subcontractor and owner/client—were clustered together, with average growth ratings in the 1.2%-2.2% range and just over 60% (green segments) reporting growth and just under 40% reporting contraction (red segments). As indicted by the oval in the inset table, nearly one third (32%) of owners/clients said there would be no change in 2016.

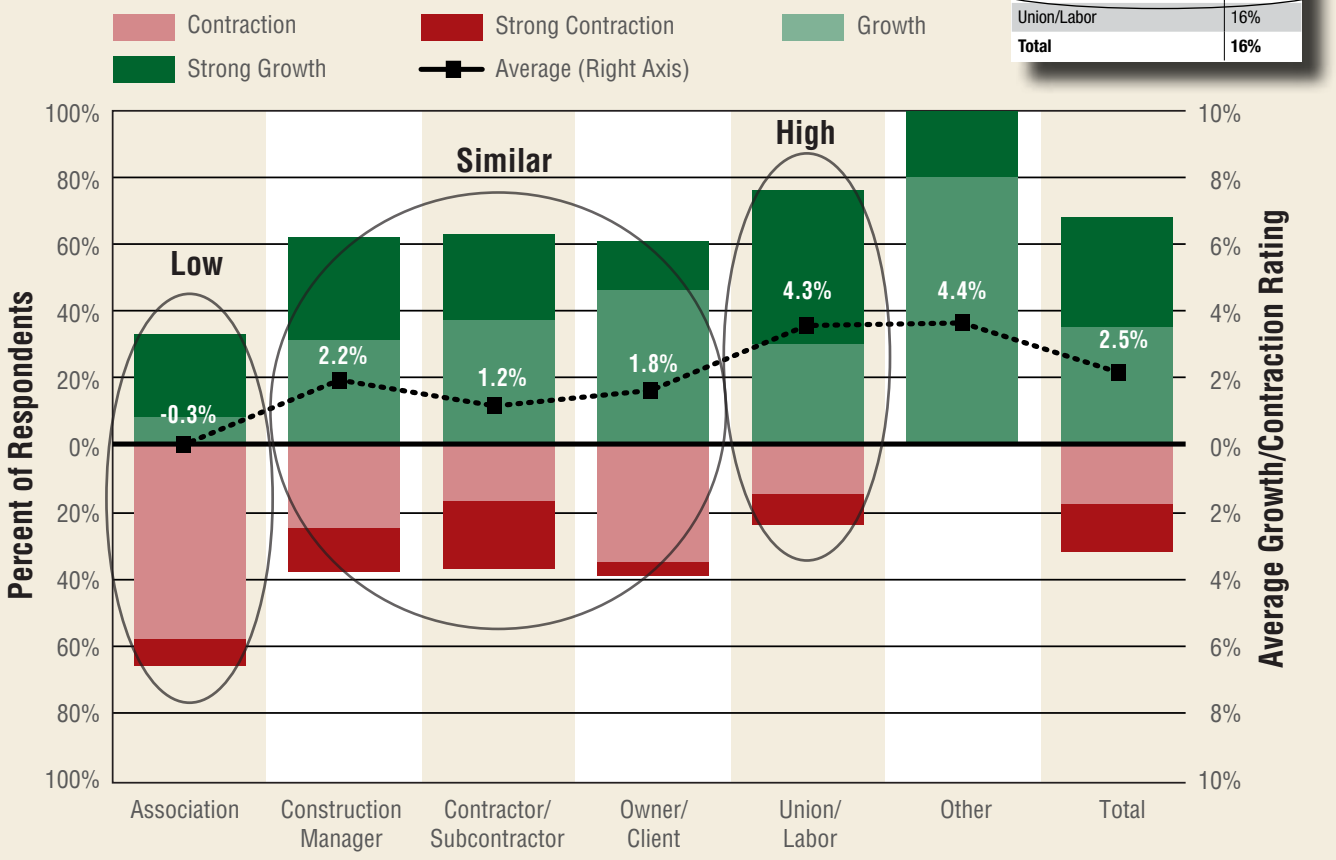
The least optimistic role was association representative with an average rating of -0.3% and 66% projecting contraction. The most optimistic role (excluding "other") was union/labor with an average growth rating about double the next highest role at 4.3%, over 75% reporting growth and just under 25% reporting contraction for 2016.

Overall (shown by the "Total" bar), 73% of those who thought there would be either growth or contraction (i.e., excluding those in the inset table who predicted no change) said they thought there would be growth in 2016 while 27% thought there would be contraction, for an average growth rating of 2.5%.

Role	No Change
Association	8%
Construction Manager	6%
Contractor/Subcontractor	15%
Owner/Client	32%
Union/Labor	16%
Total	**16%**

Exhibit 2.3

Growth/contraction projections in construction and maintenance work opportunities for 2016 by role



NOTE: For Exhibits **2.3-2.6**, those who reported no change are shown in the inset table, but are not included in the results shown in the bar charts.
The bars relate to the left axis and show the percent of the respondents for each rating (e.g., contraction, strong growth), excluding "No Change."
The black line refers to the right axis and shows the average rating. Note that the average mutes the intensity of the shortage (surplus) for those with a union craft worker shortage (surplus) because those ratings are blended with ratings from respondents experiencing the opposite, a surplus (shortage), as well as with ratings from those experiencing neither a shortage nor a surplus.

NOTE: The "Total" column to the right in **Exhibits 2.3-2.6** combines all responses for that exhibit and can serve as a benchmark comparison to which the specific data cuts (e.g., union/labor role in **Exhibit 2.3**, New England region in **Exhibit 2.5**) can be compared. The results for Total may vary modestly across **Exhibits 2.3-2.6** because not every respondent answered every question and therefore the sample composition may be different among these four analyses.

Growth/contraction for 2016 by industry results are displayed in **Exhibit 2.4**. The ovals highlight the high and low growth industries. The highest ratings were given for civil and commercial/institutional, with average growth ratings of 4.9% and 4.1%, respectively. A modest number of ratings were provided for the civil sector, yet even so, every one of them projected growth, with most indicating strong growth (dark green segment). At the other end of the scale, ratings were the least positive for the utility industry, with an average growth rating of 0%.

Exhibit 2.4

Growth/contraction projections in construction and maintenance work opportunities for 2016 by industry

Industry	No Change
Civil	0%
Commercial/Institutional	15%
Manufacturing	15%
Petro/Chemical	18%
Utility	17%
Total	**16%**

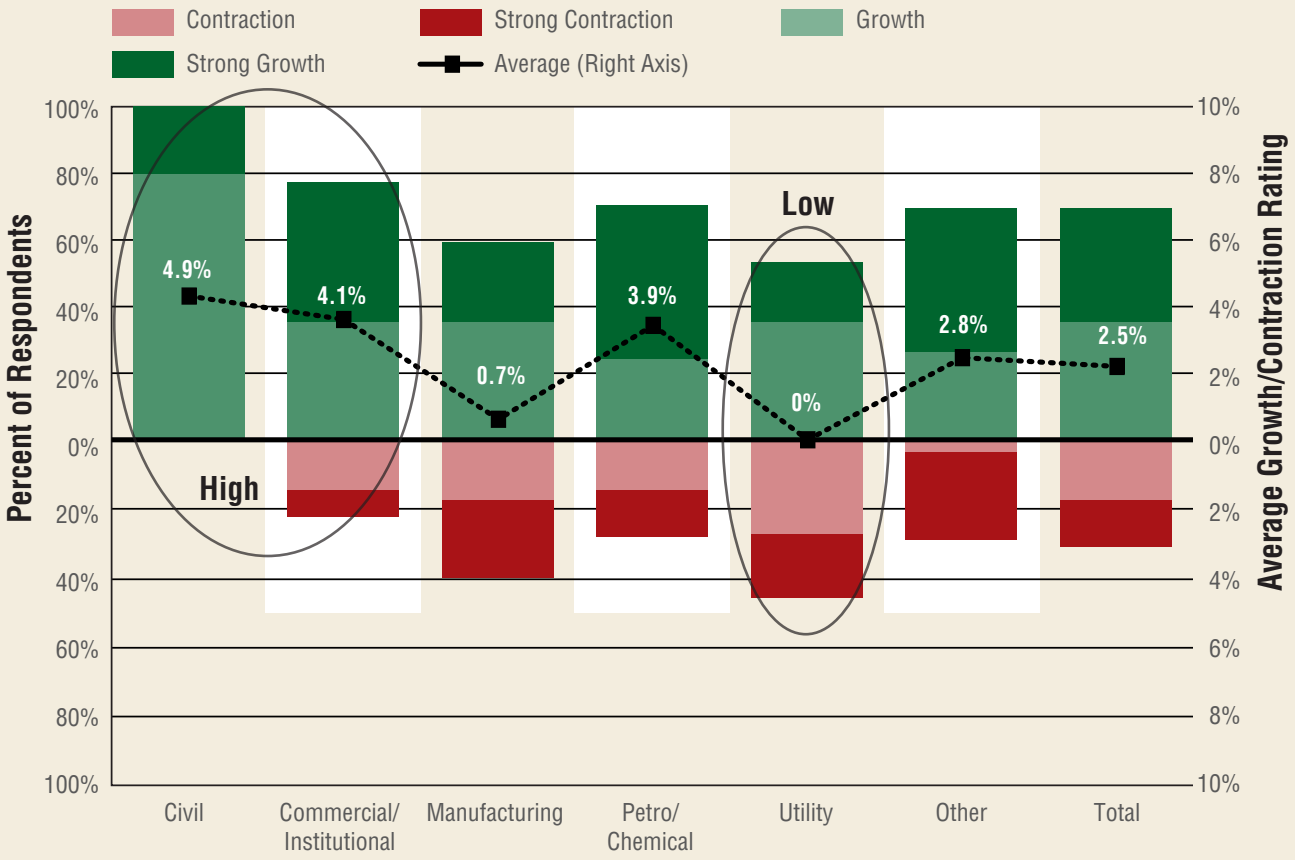
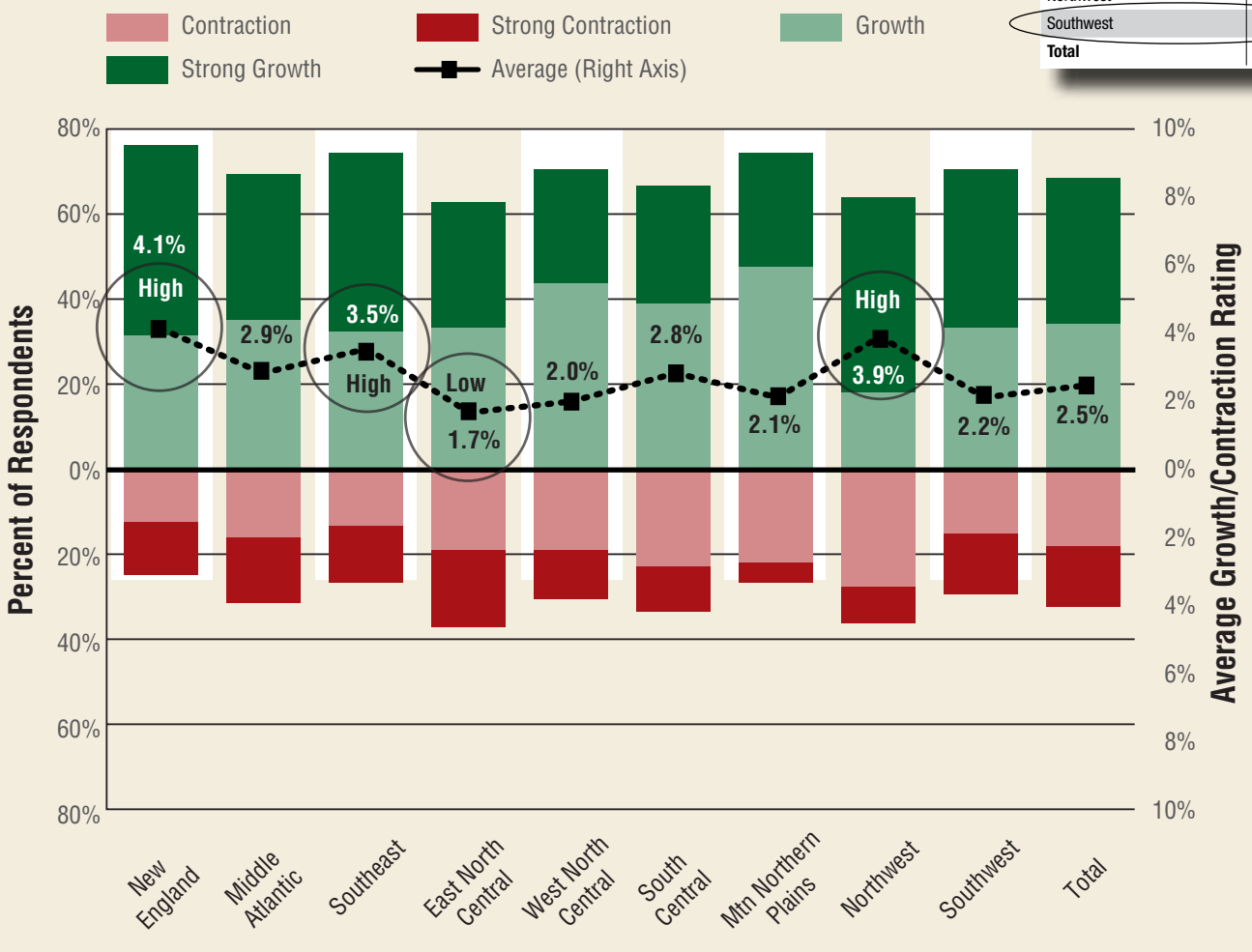


Exhibit 2.5 illustrates the projections by geographic region. The New England, Southeast and Northwest regions all had average ratings greater than 3.0%. The lowest rated region was East North Central with a 1.7% expected growth rate in 2016. A little over a fourth of the respondents for the Mountain Northern Plains and Southwest regions each thought there would be no change in 2016, as shown in the inset table.

Region	No Change
New England	7%
Middle Atlantic	12%
Southeast	17%
East North Central	16%
West North Central	20%
South Central	16%
Mountain Northern Plains	26%
Northwest	4%
Southwest	27%
Total	**16%**

Exhibit 2.5

Growth/contraction projections in construction and maintenance work opportunities for 2016 by region



Organizations in the mid-range of size displayed both the strongest and weakest projections, as shown in **Exhibit 2.6.** In other words, respondents in organizations with 501-1,000 employees projected a 1.2% average growth rate for 2016 while those in the next larger size organization, 1,001-5,000 employees, had ratings that were over four times greater, 4.9%. There was no trend between organization size and growth projections. Many (26%) from organizations with 5,001-10,000 employees projected no change for 2016, as shown in the inset table.

Organization Size	No Change
1-25	26%
26-100	18%
101-500	16%
501-1,000	12%
1,001-5,000	20%
5,001-10,000	26%
10,000+	10%
Total	**16%**

Exhibit 2.6

Growth/contraction projections in construction and maintenance work opportunities for 2016 by organization size

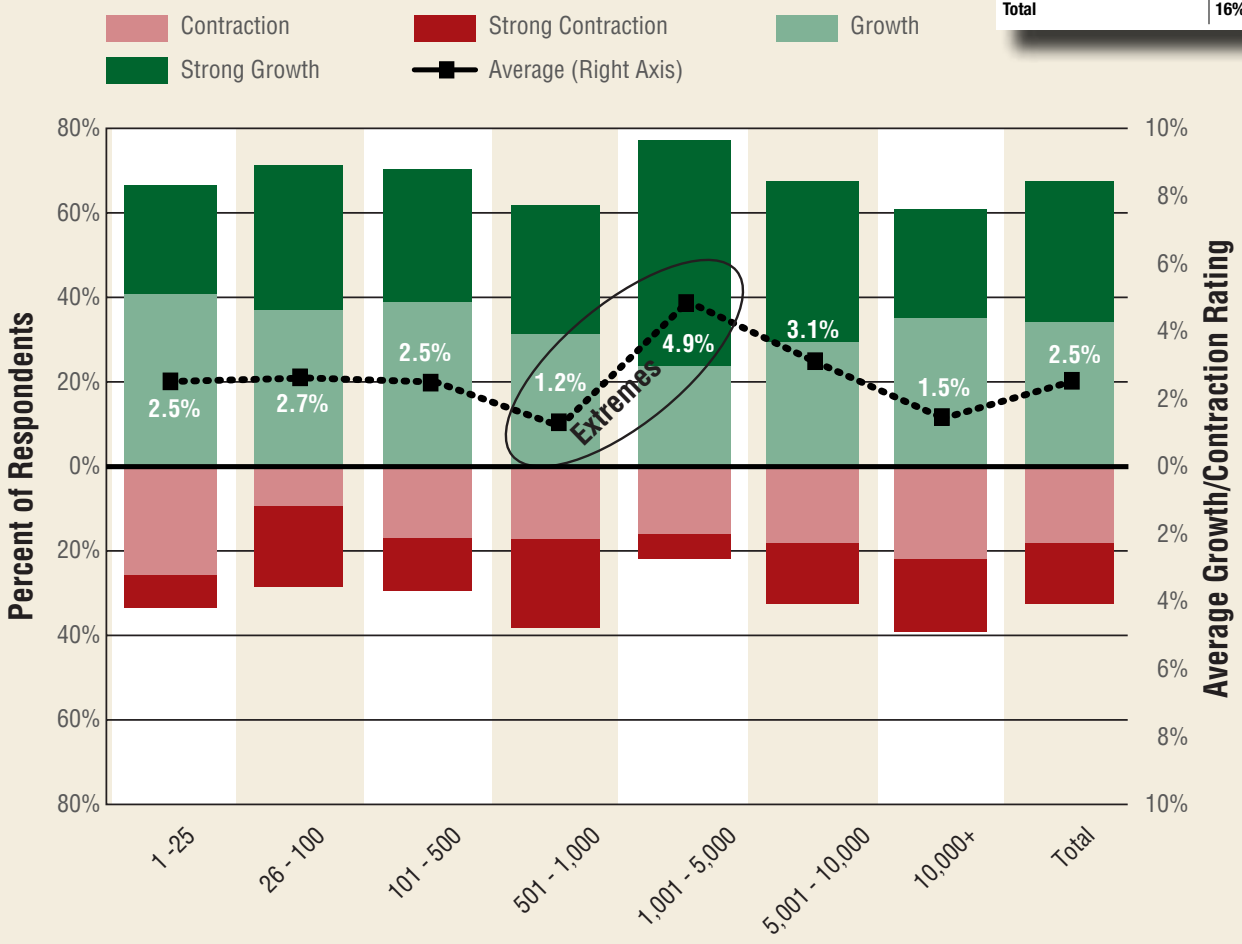


Exhibit 2.7 summarizes the highlights from each data cut regarding growth prospects for 2016. Union/labor representatives were the most optimistic about growth in construction and maintenance in their organization while association representatives were the least optimistic. Respondents rated the civil and commercial/institutional industries as most likely to achieve higher growth and the utility industry likely to have lower growth.

The New England, Southeast and Northwest regions received the strongest projections for growth and the East North Central received the weakest. For the final data cut, organization size, those from organizations with 1,001-5,000 employees were more likely to project growth and those in organizations with 501-1,000 employees were the least likely to project growth in their own organizations. The percent of respondents rating growth for the listed data cut is shown in parenthesis in the table.

Exhibit 2.7

Highlights of growth projections in construction and maintenance work opportunities for 2016 by data cut

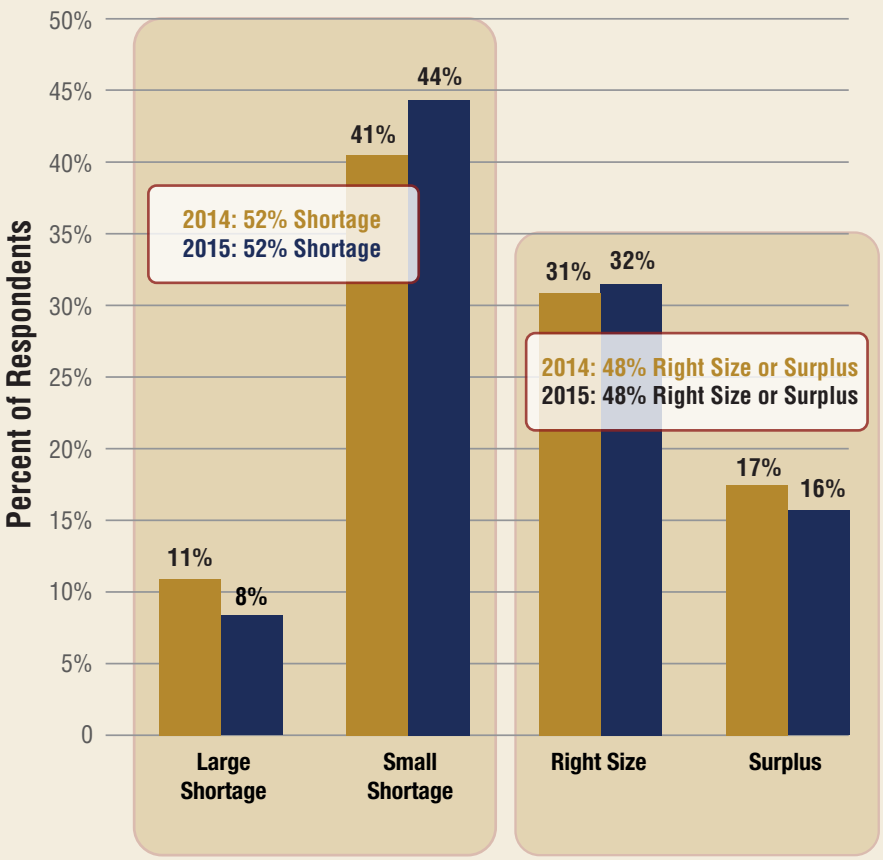
	Growth Level	
Data Cut	**Higher**	**Lower**
Role	Union/Labor (76% growth)	Association Representative (33% growth)
Industry	Civil (100%) Commercial/Institutional (77%)	Utility (53%)
Region	New England (76%) Southeast (74%) Northwest (63%, 3.9% average)	East North Central (63%, 1.7% average)
Organization Size	1,001-5,000 (77%)	501-1,000 (62%)

III. Overall Union Craft Labor Supply

Part 1. Historical Shortages and Surpluses

As shown in **Exhibit 3.1**, just over half (52%) of the respondents said there was a union craft labor shortage in their company in 2015. These can be considered "actual" results since respondents reported their company's experience from the previous year (not projections for upcoming years). A plurality (44%) reported a small shortage and 8% reported a large shortage. Just under a third (32%) indicated that their labor force was the right size and 16% said they had a surplus in 2015. These results are very similar to the results from the previous year's study, conducted in 2015, as is readily seen in **Exhibit 3.1**.

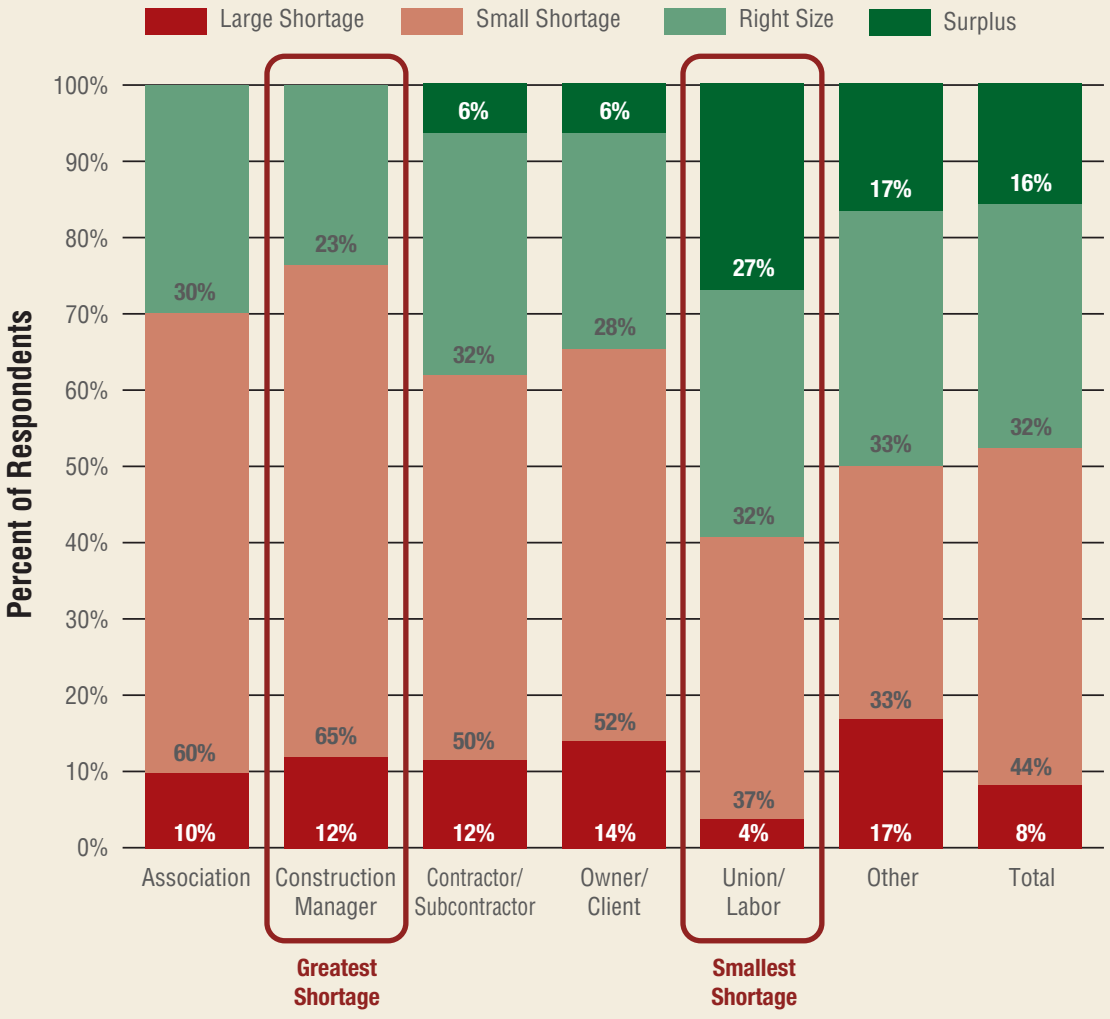
Exhibit 3.1
Overall historical union craft labor supply in 2014 and 2015



Exhibits **3.2-3.6** show the results for union craft labor supply in 2015 (**Exhibit 3.1**) by four data cuts: role, industry, region and organization size. The bars represent the percent of the sample providing each rating, not the actual percent of shortage or surplus in the union craft workforce.

In **Exhibit 3.2**, the results for 2015 from **Exhibit 3.1** are broken out by respondent role. Construction managers expressed the greatest concern over union craft labor shortages, with 77% reporting a shortage (12% large shortage, 65% small shortage) and none reporting a surplus. Conversely, union/labor respondents reported the lowest shortage rates at 41% (4% large shortage, 37% small shortage) and the highest surplus rate (27%). For three of five role categories and total, about a third said the workforce was the right size in their organization in 2015—while construction managers and owners/clients reported lower rates of having the right sized union craft labor force at 24% and 28%, respectively.

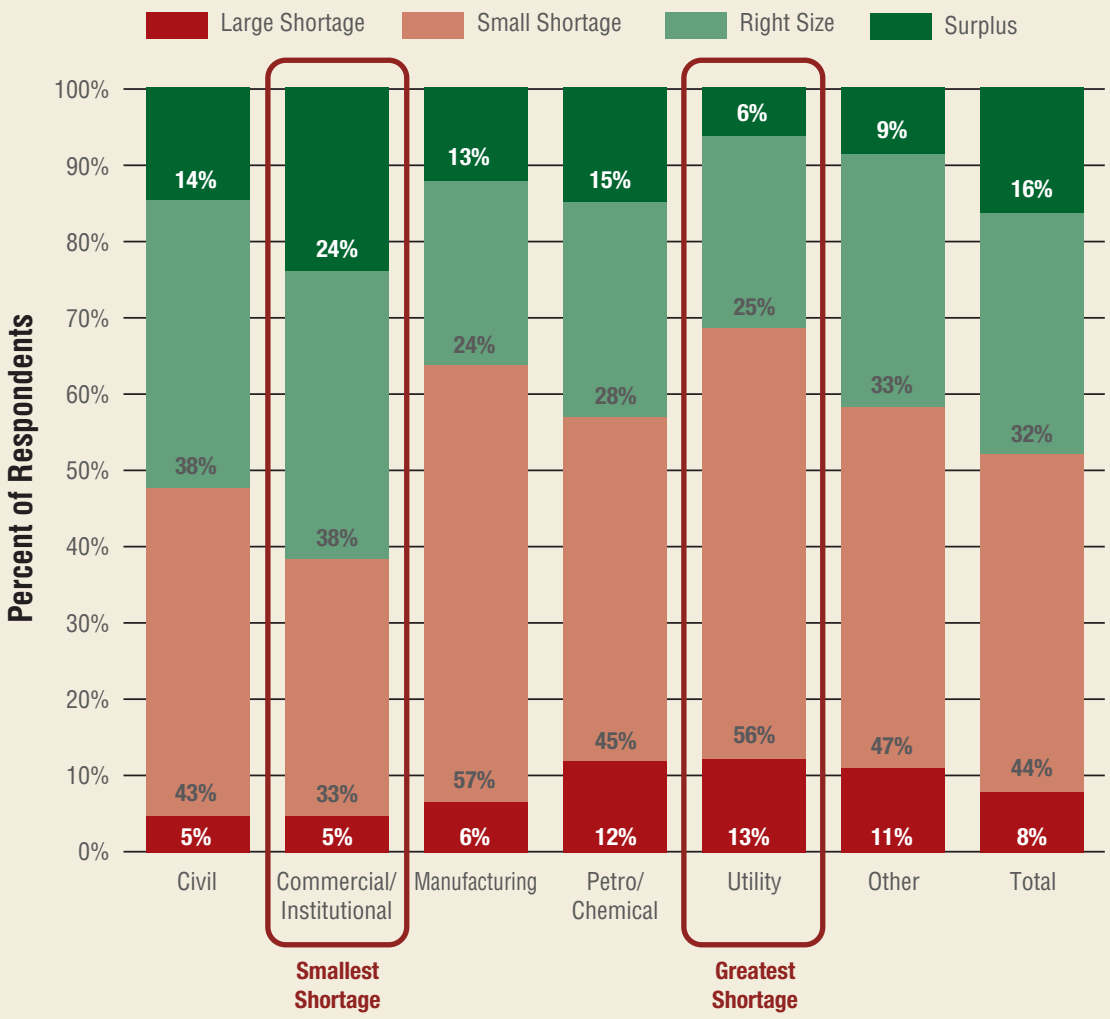
Exhibit 3.2
Union craft labor supply in 2015 by role



NOTE: The "Total" column to the right in **Exhibits 3.2-3.5** combines all responses for that exhibit and can serve as a benchmark comparison to which the specific data cuts (e.g., union/labor role in **Exhibit 3.2**, New England region in **Exhibit 3.4**) can be compared. The results for Total may vary modestly across **Exhibits 3.2-3.5** because not every respondent answered every question and therefore the sample composition may be different among these four analyses.

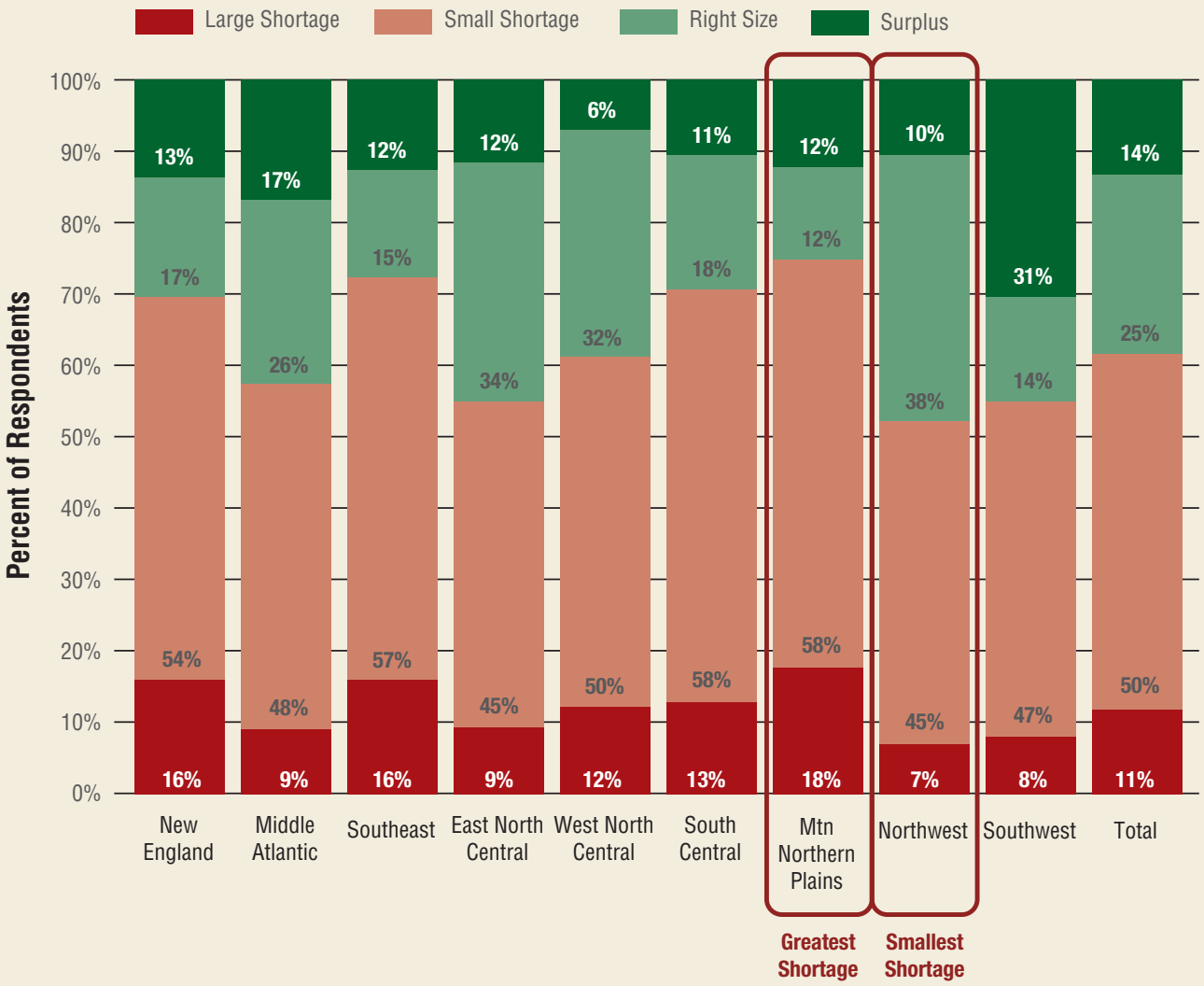
Exhibit 3.3 illustrates the findings by industry data cut. Once again, highlighting the high and low findings with ovals, results show that the lowest reported incidence of a labor shortage was in commercial/institutional work and the greatest need was in the utility industry. Specifically, 38% said there was a shortage (5% large shortage, 33% small shortage) of union craft workers in their organization's commercial/institutional sector work and 24% said there was a surplus. At the other end of the spectrum, in the utility sector, 69% said they had a shortage (13% large shortage, 56% small shortage) and just 6% said they experienced a surplus of union craft workers.

Exhibit 3.3
Union craft labor supply in 2015 by industry



The results by region are shown in **Exhibit 3.4**. In the Northwest region the labor shortage was the least pronounced, although 52% still said they experienced some sort of union craft labor shortage in 2015 (7% large shortage, 45% small shortage). Similar results were found for the Middle Atlantic and East North Central regions. The most critical labor shortage was in the Mountain Northern Plains region where 76% reported a shortage (18% large shortage, 58% small shortage) and 13% reported a surplus.

Exhibit 3.4
Union craft labor supply in 2015 by region



For **Exhibit 3.5** the results for union craft labor supply in 2015 were analyzed according to the number of employees in the organization in which the respondent was employed. The smallest organizations reported the lowest shortage rates, 41% (8% large shortage, 33% small shortage). Larger organizations—but not the very largest ones—indicated the most significant shortage, with 74% of the respondents reporting a shortage (18% large shortage, 56% small shortage).

Exhibit 3.5
Union craft labor supply in 2015 by organization size

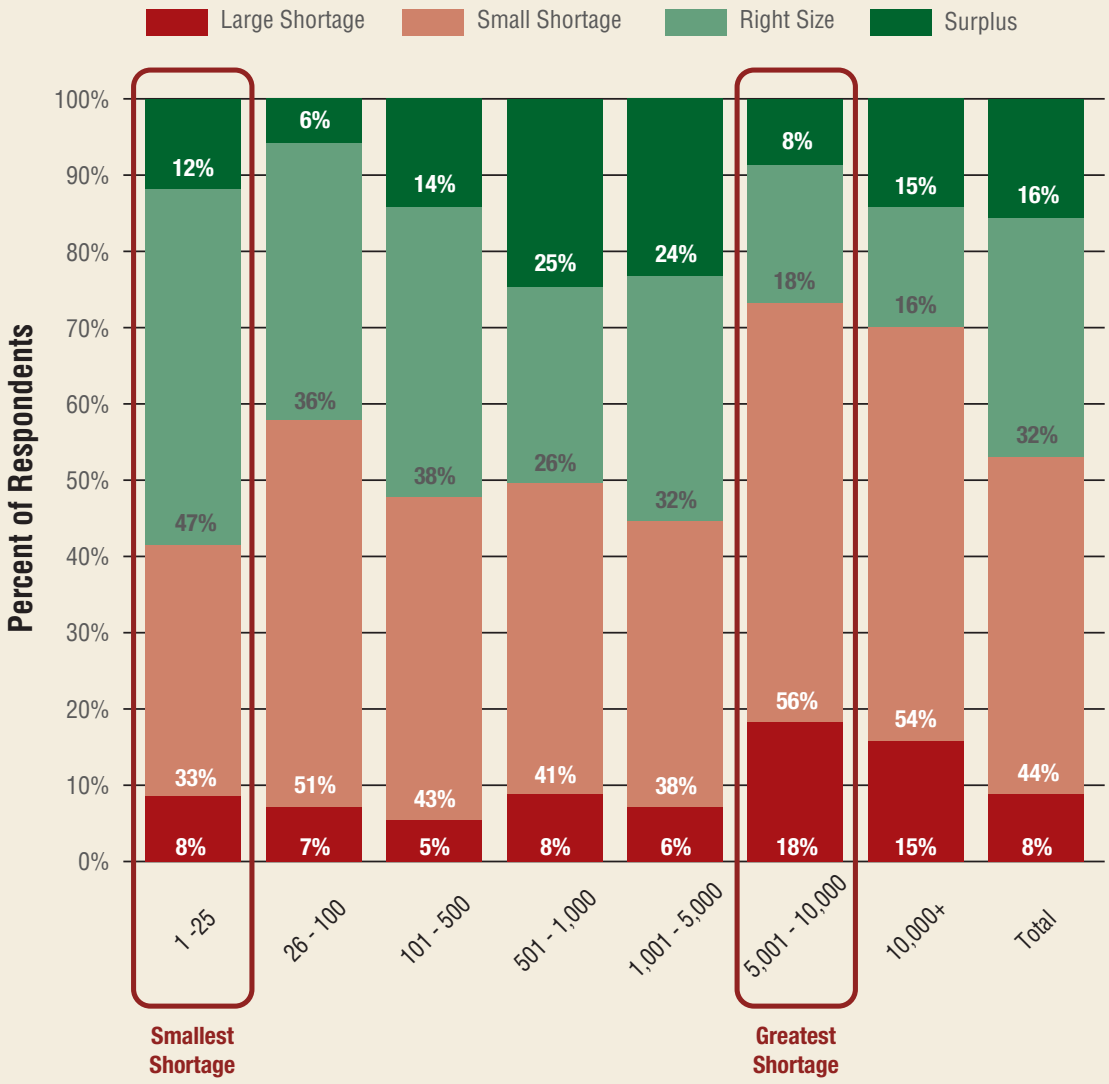


Exhibit 3.6 summarizes the highlights from each data cut regarding union craft workforce shortages/surpluses. Construction managers were the most likely and union/labor representatives were the least likely to report worker shortages. The utility industry garnered the most concern and the commercial/institutional the least concern regarding labor shortages.

Regarding the region data cut, larger pervasiveness of worker shortages was noted in the Mountain Northern Plains region and smaller pervasiveness of shortages was projected for the Northwest. Finally, a larger percent of those from organizations with 5,001-10,000 employees expressed shortages regarding the union craft labor supply while a smaller percent of those in very small organizations (1-25 employees) reported shortages. The percent of respondents rating shortage for the listed data cut is shown in parenthesis in the table.

Exhibit 3.6

Highlights of experienced union craft labor shortage levels in 2015 by data cut

	Shortage Level	
Data Cut	**Larger**	**Smaller**
Role	Construction Manager (77%)	Union/Labor (41%)
Industry	Utility (69%)	Commercial/Institutional (38%)
Region	Mountain Northern Plains (76%)	Northwest (52%)
Organization Size	5,001-10,000 (74%)	1-25 (41%)

III. Overall Union Craft Labor Supply

Part 2. Time Taken to Fill Union Craft Jobs

Another aspect of this study is to look at the time it takes to fill union craft positions. Overall, the average number of days was 2.0. Fifty percent of the jobs were filled in one day and about three fourths (73%) were filled in two days. However, the findings varied by demographic variable, as shown below.

Exhibit 3.7 shows the averages by role. The management roles thought it took longer and the union role thought it took less time to fill union worker requests. All of the averages from the management roles (2.4-3.0 days) were higher than the overall average while only the average rating from the union role (1.6 days) was below (i.e., a shorter time period) the overall average of 2.0 days.

Exhibit 3.7
Average number of days taken to fill union craft labor requests by role

Role	Number of Days
Association Representative	3.0
Construction Manager	3.0
Contractor/Subcontractor	2.4
Owner/Client	2.4
Union/Labor Representative	1.6
Average	**2.0**

Longest Time

Shortest Time

Exhibit 3.8 contains the results by industry. It took the longest time, on average, to fill union craft positions in the utility industry (2.5 days). The quickest time was in the civil industry (1.5 days).

Exhibit 3.8
Average number of days taken to fill union craft labor requests by industry

Industry	Number of Days
Civil	1.5
Commercial/Institutional	1.8
Manufacturing	2.2
Petro/Natural Gas/Chemical	2.2
Utility	2.5
Average	**2.0**

Shortest Time

Longest Time

Exhibit 3.9 displays the average number of days by region. The results clustered in a fairly tight band, ranging from a low of 1.8 days in the Northwest to a high of 2.6 days in the Southeast region.

Exhibit 3.9
Average number of days taken to fill union craft labor requests by region

Region	Number of Days
New England	2.3
Middle Atlantic	1.9
Southeast	2.6
East North Central	2.2
West North Central	2.3
South Central	2.5
Mountain Northern Plains	2.2
Northwest	1.8
Southwest	1.9
Average	**2.0**

Longest Time

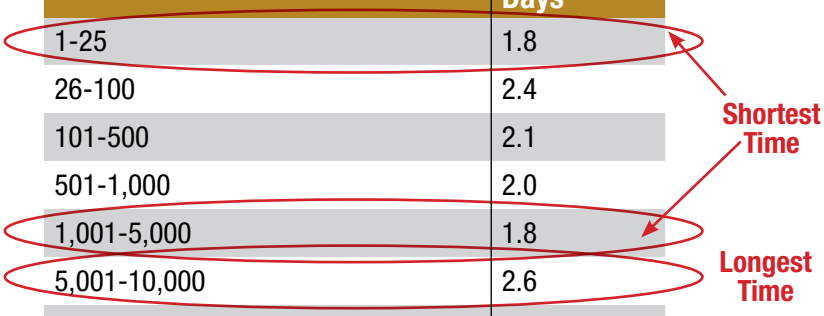
Shortest Time

Exhibit 3.10 shows how long it typically took to fill union craft jobs by organization size. Like the results for the region analysis, the values were clustered together with modest variance. In fact, the range was less than one day, going from 1.8 days for organizations with 1-25 and 1,001-5,000 employees to 2.6 days for those with 5,001-10,000 employees. There was no apparent correlation between organization size and time taken to fill union craft positions.

Exhibit 3.10

Average number of days taken to fill union craft labor requests by organization size

Organization Size	Number of Days
1-25	1.8
26-100	2.4
101-500	2.1
501-1,000	2.0
1,001-5,000	1.8
5,001-10,000	2.6
More than 10,000	2.0
Average	**2.0**



IV. Craft Specific Results: Overview

Part 1. Historical: Results for 2015

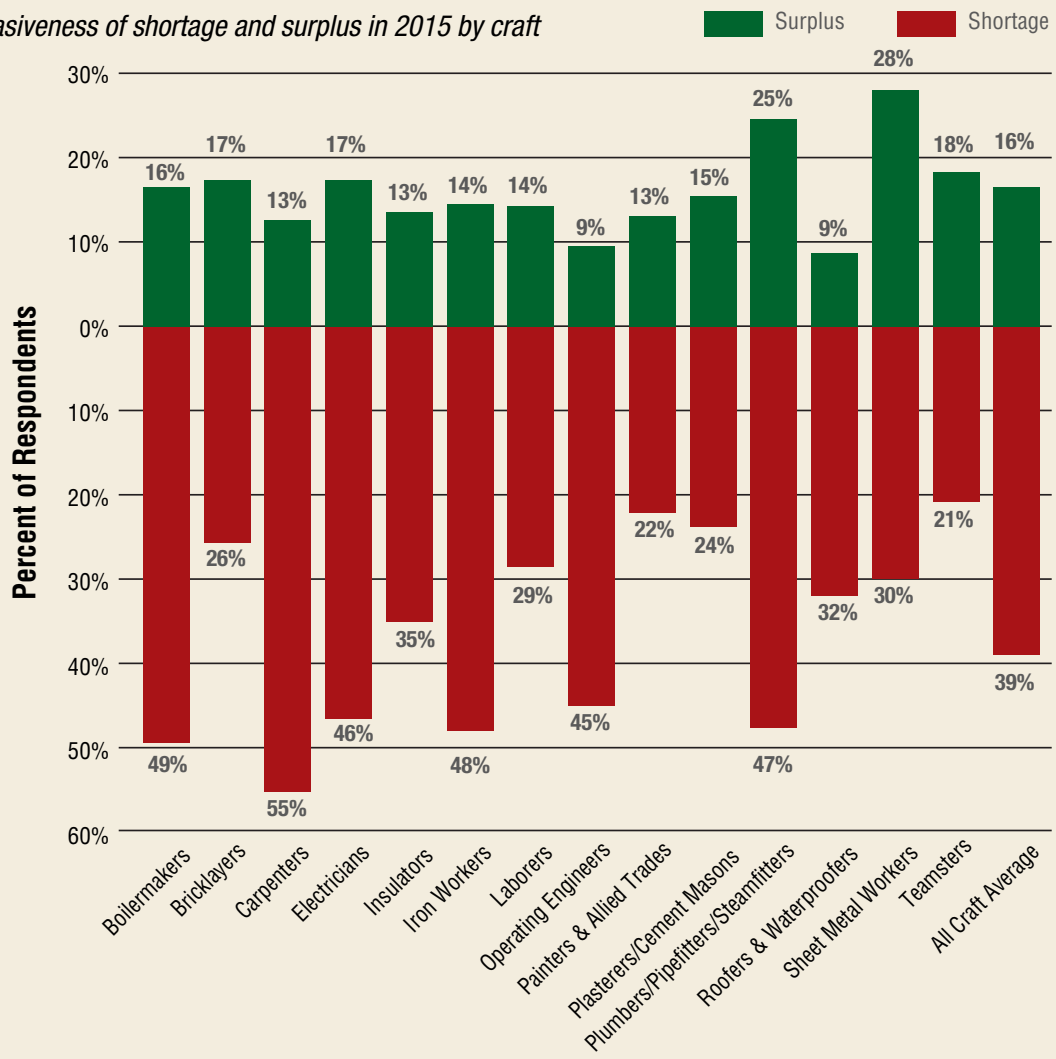
Exhibits 4.1 and 4.2 display perhaps the single best overviews of the union craft labor surplus and shortage situation by craft for 2015. In **Exhibit 4.1** the red bar segments show what percent of the respondents said there was a shortage of manpower for each craft; the green segments show the percent that reported a surplus. For example, for Boilermakers, 49% of the respondents said there was a shortage in their organization in 2015 while 16% reported a surplus. The crafts are listed in alphabetical order with the all-craft average shown at the far right of **Exhibits 4.1 and 4.2**.

As shown in **Exhibit 4.1**, the pervasiveness of shortage ratings ranged from a low of 21% for Teamsters to a high of 55% for Carpenters. This means that from 21% to 55% of the organizations represented in this study experienced a shortage of workers for a given single union craft in 2015. It does not mean that there was a 21% shortage of Teamsters, however, for example. When considering all crafts together, a higher percent of organizations would have experienced a shortage. Regarding a surplus of workers, the pervasiveness was less pronounced. The range went from 9% for Roofers & Waterproofers to 28% for Sheet Metal Workers.

The all-craft average was 39% for shortage and 16% for surplus, a 2.4:1 ratio. In other words, for each person reporting a surplus of union craft labor in their organization there were 2.4 others reporting a shortage in their organization.

Exhibit 4.1

Pervasiveness of shortage and surplus in 2015 by craft



It is important to note that the bar and line charts in **Exhibits 4.1, 4.2, 4.4, 4.5, 4.8 and 4.9** show only those reporting a shortage or surplus—they exclude those reporting no shortage or surplus, which was a significant percent of the ratings. The tables in **Exhibit 4.3, 4.6 and 4.10** list the percent of the ratings stating that there was no shortage or surplus.

In Exhibit 4.1 the pervasiveness of the shortage or surplus of union craft labor was examined. **Exhibit 4.2** looks at the degree or intensity of the shortage for those reporting a shortage, the degree of the surplus for those reporting a surplus, and the overall degree of shortage/surplus.

More specifically, the green line in **Exhibit 4.2** focuses only on those indicating a surplus and averages the size of their surplus ratings. Take Boilermakers as an example. For the 16% of the sample that said there was a surplus of Boilermakers (see **Exhibit 4.1** to locate the 16%), the average degree of surplus was 8.9%--those respondents said their organization had 8.9% too many Boilermakers, on average.

Similarly, the red line focuses only on those in the sample indicating a shortage in their organization and then averages just those data points. For example, as shown in **Exhibit 4.1**, 49% of the sample reported a shortage of Boilermakers and the average degree or amount of that shortage for this subset of the sample was 7.1% (**Exhibit 4.2**).

Finally, the grey line averages all ratings: those saying they experienced a surplus, those saying they experienced a shortage and those reporting neither a surplus nor shortage. Although it is a useful overall metric, it does tend to mask the intensity of the shortage (surplus) for those with a union craft worker shortage (surplus) because those ratings are blended with ratings from respondents experiencing the opposite, a surplus (shortage), as well as with ratings from those experiencing neither a shortage nor a surplus.

In sum, to gain an overall assessment of the status of the union craft labor status, it is useful to examine **Exhibits 4.1 and 4.2** together in order to combine the pervasiveness of the shortage or surplus (**Exhibit 4.1**) with the degree or size of the shortage or surplus (**Exhibit 4.2**).

Exhibit 4.2

Degree of shortage and surplus in 2015 by craft

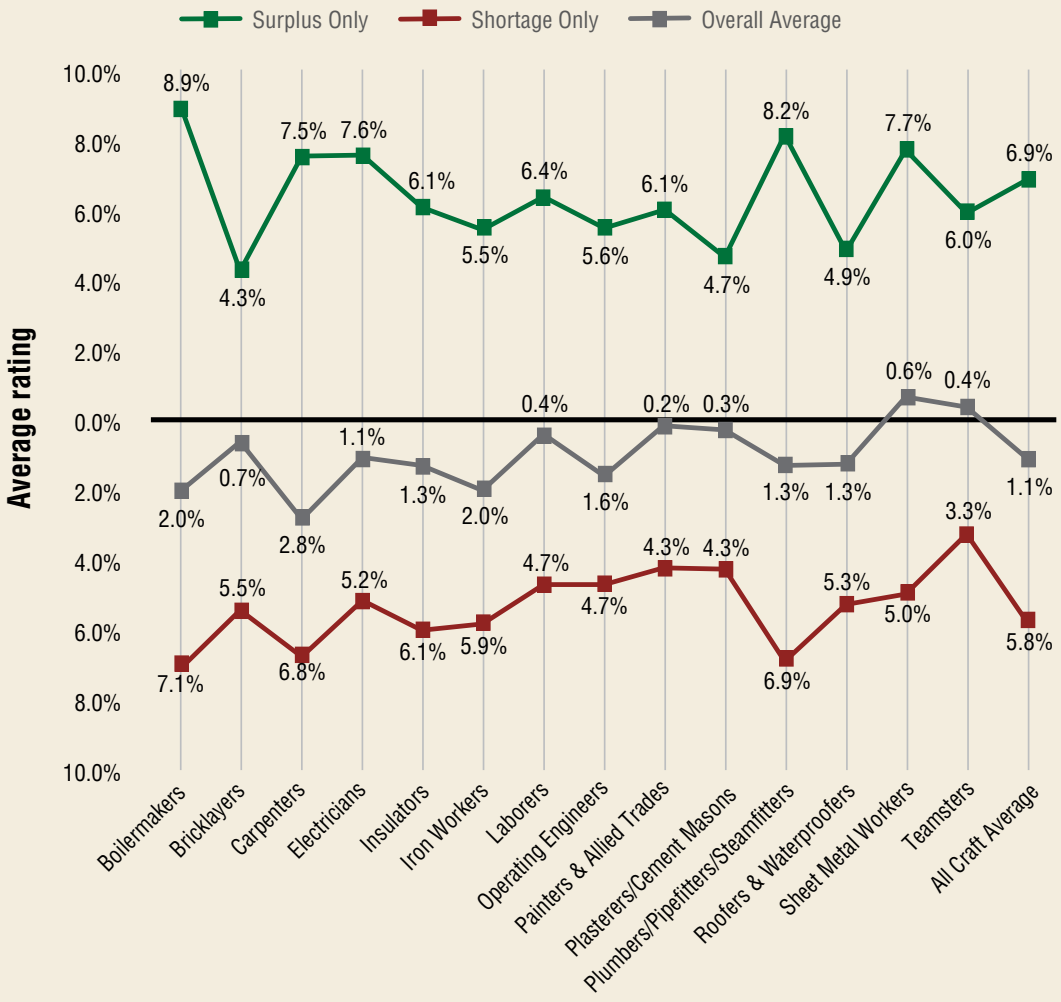


Exhibit 4.3 shows the percent of the respondents who said the union craft workforce in their organization was the right size. These results range from a low of 28% for Plumbers/Pipefitters/Steamfitters to a high of 65% for Painters & Allied Trades. The all-craft average was 45%, meaning nearly half of the raters thought the union craft labor supply in their organization in 2015 was about the right size, there was no shortage or surplus.

Exhibit 4.3

Percent of respondents reporting neither a shortage nor surplus in 2015 by craft

Craft	No Shortage or Surplus
Boilermakers	34%
Bricklayers	57%
Carpenters	32%
Electricians	36%
Insulators	52%
Iron Workers	38%
Laborers	57%
Operating Engineers	46%
Painters & Allied Trades	65%
Plasterers/Cement Masons	61%
Plumbers/Pipefitters/Steamfitters	28%
Roofers & Waterproofers	59%
Sheet Metal Workers	42%
Teamsters	61%
All Craft Average	**45%**

IV. Craft Specific Results: Overview

Part 2. Projections: Results for 2016

Exhibits 4.4-4.6 parallel **Exhibits 4.1-4.3**, except that they focus on projections for 2016 whereas **Exhibits 4.1-4.3** provided a historical perspective on 2015. (For an explanation of how to understand these exhibits, see **Exhibits 4.1-4.3.**)

As illustrated in **Exhibit 4.4**, overall for the all craft average, 42% of the respondents projected a shortage of union craft labor in 2016 and 16% predicted a surplus, for a 2.6:1 ratio of shortage to surplus (for 2015 the ratio was 2.4:1.0). Thus, the pervasiveness of the shortage is projected to be slightly greater in 2016 than it was in 2015.

Exhibit 4.4

Pervasiveness of shortage and surplus in 2016 by craft

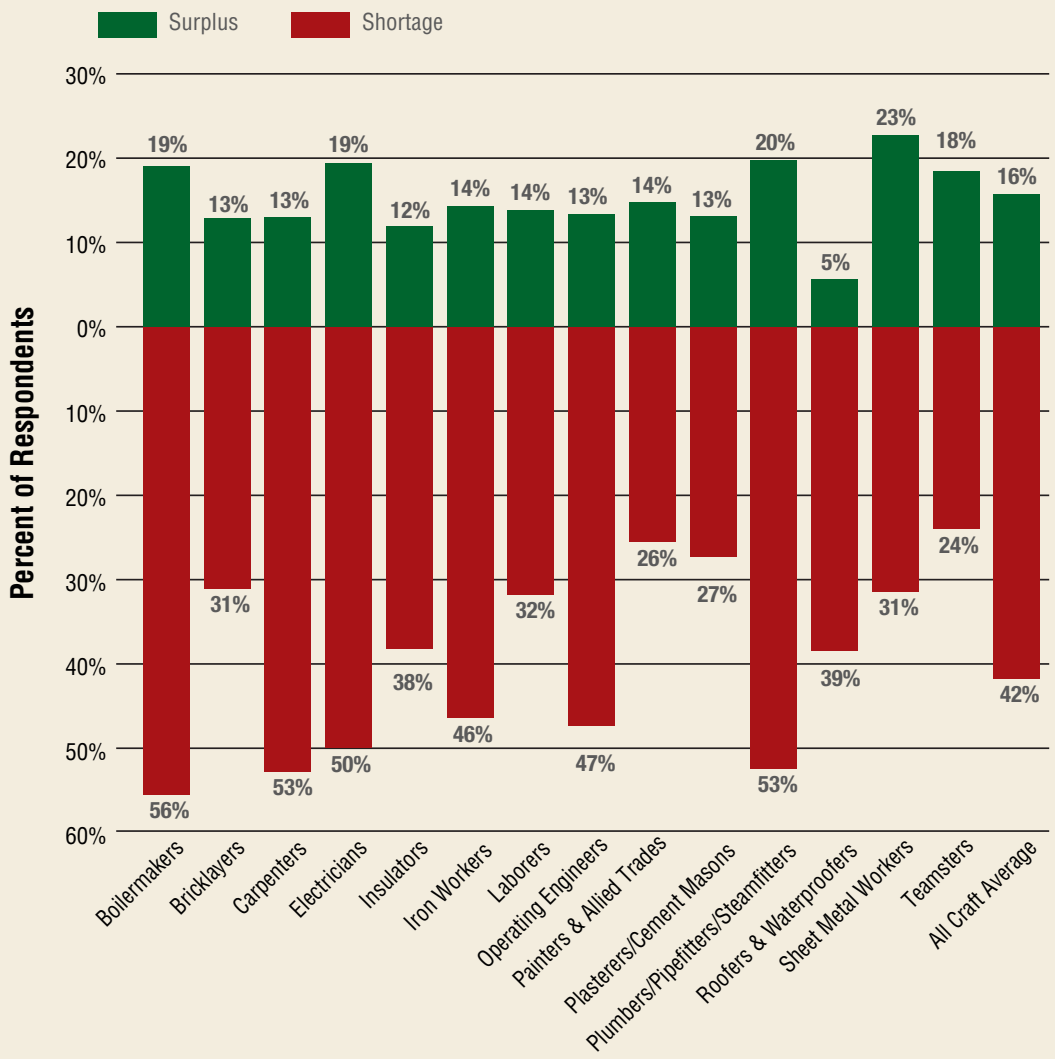
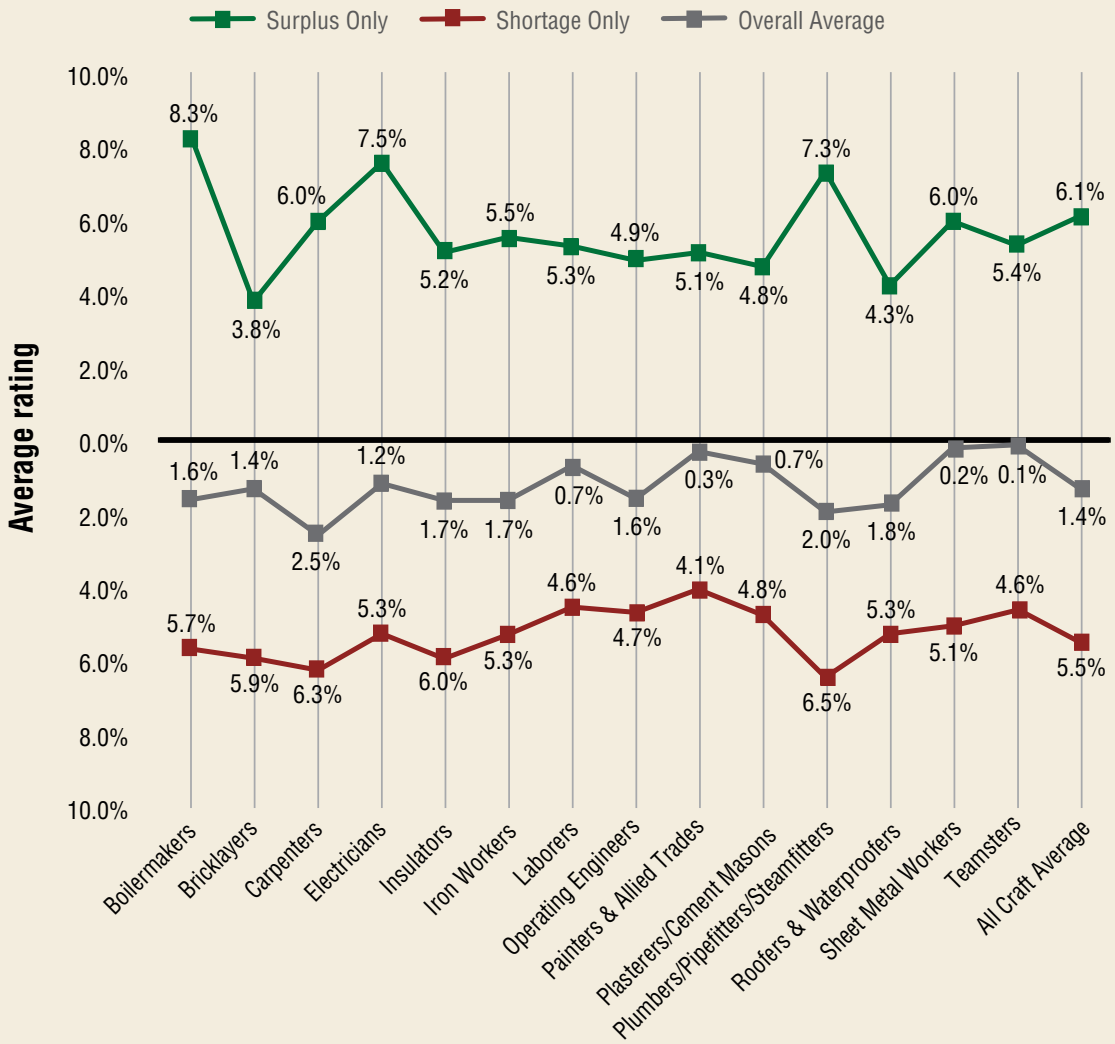


Exhibit 4.5 displays the degree or intensity of the projected shortage/surplus for union craft labor in 2016. For those projecting a shortage, the all craft average projected shortage is 5.5% for 2016 (in 2015 the average shortage was 5.8%). For those projecting a surplus, the degree of surplus was rated at 6.1% (in 2015 the rated surplus averaged 6.9%).

The overall average projection is for a shortage of 1.4% in 2016 (in 2015 the average was a shortage of 1.1%). However, as stated earlier, this metric can mask the situation experienced by individual organizations. To illustrate, if one organization had a surplus of 7% and another had a shortage of 7%, the average would be 0%, yet each organization would still have a significant labor issue—too many or too few workers. Thus, care should be given to over interpreting the results shown by the overall average (grey line).

Exhibit 4.5

Degree of shortage and surplus in 2016 by craft



As shown in **Exhibit 4.6**, the percent saying they do not foresee a shortage or surplus in 2016 ranged from 25% for Boilermakers to 60% for Painters & Allied Trades and Plasterers/Cement Masons. The all craft average was 43%, meaning a significant percent of the respondents thought their union craft labor workforce would be about right in their organization in 2016.

Exhibit 4.6

Percent of respondents projecting neither a shortage nor surplus in 2016 by craft

Craft	No Shortage or Surplus
Boilermakers	25%
Bricklayers	56%
Carpenters	34%
Electricians	31%
Insulators	50%
Iron Workers	39%
Laborers	55%
Operating Engineers	39%
Painters & Allied Trades	60%
Plasterers/Cement Masons	60%
Plumbers/Pipefitters/Steamfitters	27%
Roofers & Waterproofers	56%
Sheet Metal Workers	46%
Teamsters	58%
All Craft Average	**43%**

IV. Craft Specific Results: Overview

Part 3. Pervasiveness of Shortage: 2015 & 2016

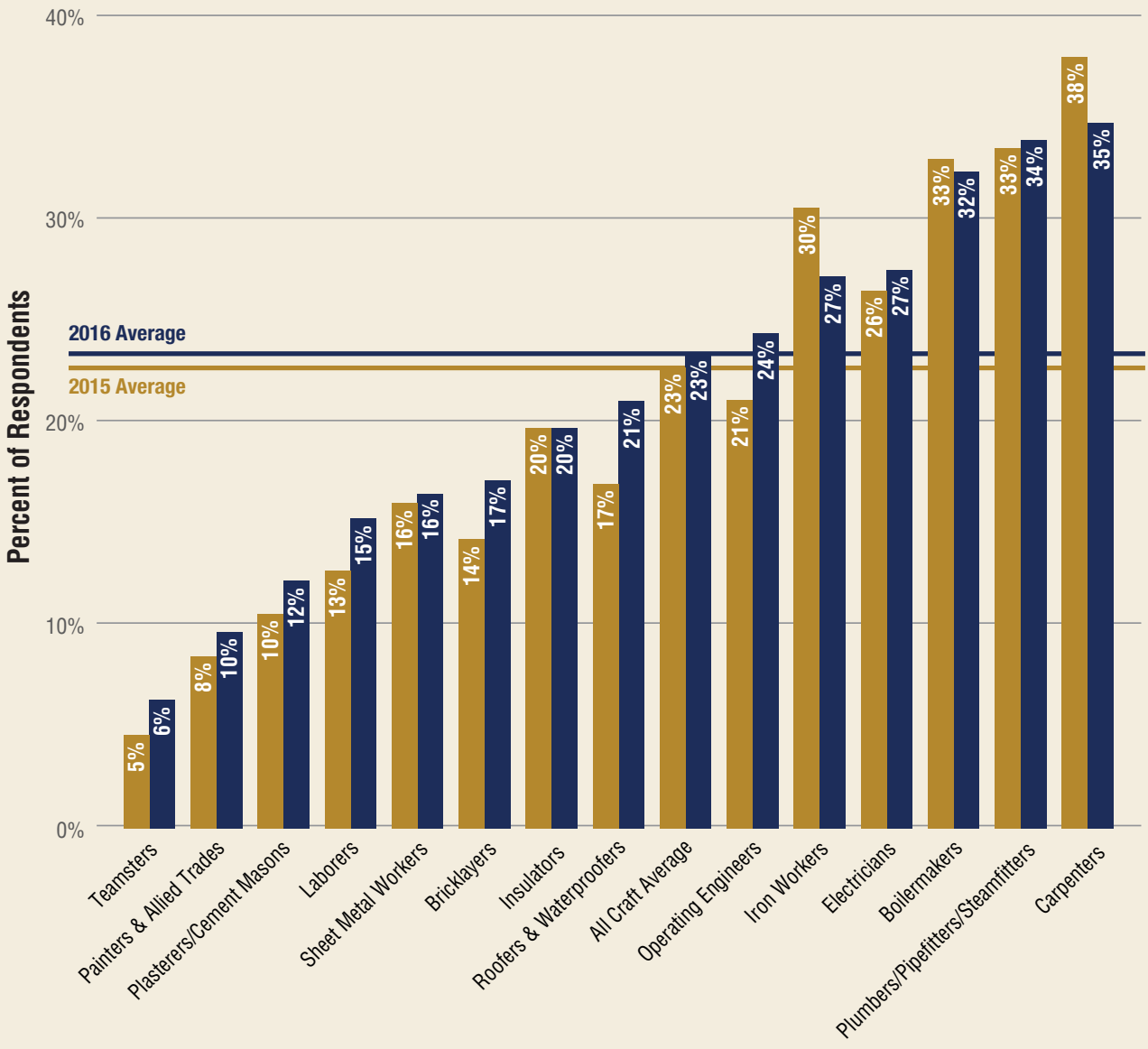
Exhibit 4.7 shows the pervasiveness of the union craft labor shortage by craft for both 2015 (historical results) and 2016 (projections), as reported this year, in the 2016 survey. The values shown are based only on those reporting more than a small shortage (i.e., greater than a 3% shortage). Therefore, lesser shortages of 1%-3% are not included in **Exhibit 4.7**. In other words, the exhibit shows the pervasiveness of (i.e., percent of respondents reporting) labor shortages when the degree of the shortage was more than a small amount. Results are ordered from smallest to largest based on 2016 results.

The all craft average is 23% for both 2015 and 2016. Carpenters exhibited the largest shortage pervasiveness at 38% and 35% in 2015 and 2016, respectively. Teamsters had the smallest percent of respondents reporting a shortage in their organization of at least 4%, at 5% and 6% in 2015 and 2016, respectively. Only three crafts—Boilermakers, Carpenters and Iron Workers—had a smaller reported shortage in 2016 than in 2015.

This exhibit offers a concise, organized way to see an overall rank ordering of the unions, from the least to the largest shortage of workers.

Exhibit 4.7

Pervasiveness of larger degrees of shortage (at least 4%) by craft: 2015 & 2016



IV. Craft Specific Results: Overview

Part 4. Apprentices: Results for 2015

The exhibits in this part (**Part 4**) parallel those in **Parts 1 and 2** in this section (**Section IV**). The difference is that here the focus is on apprentices in 2015, whereas in **Parts 1 and 2 (Exhibits 4.1-4.7)** the focus is on journeymen in 2015 and 2016, respectively.

As **Exhibit 4.8** shows, overall 35% reported a shortage of apprentices in 2015 in their organization and 14% reported a surplus. These findings are similar to those for the journeymen shortage and surplus in 2015 and 2016. The ratio of those saying they had a shortage to those saying they had a surplus of apprentices is 2.5:1.

Exhibit 4.8

Pervasiveness of shortage and surplus in 2015 by craft for apprentices

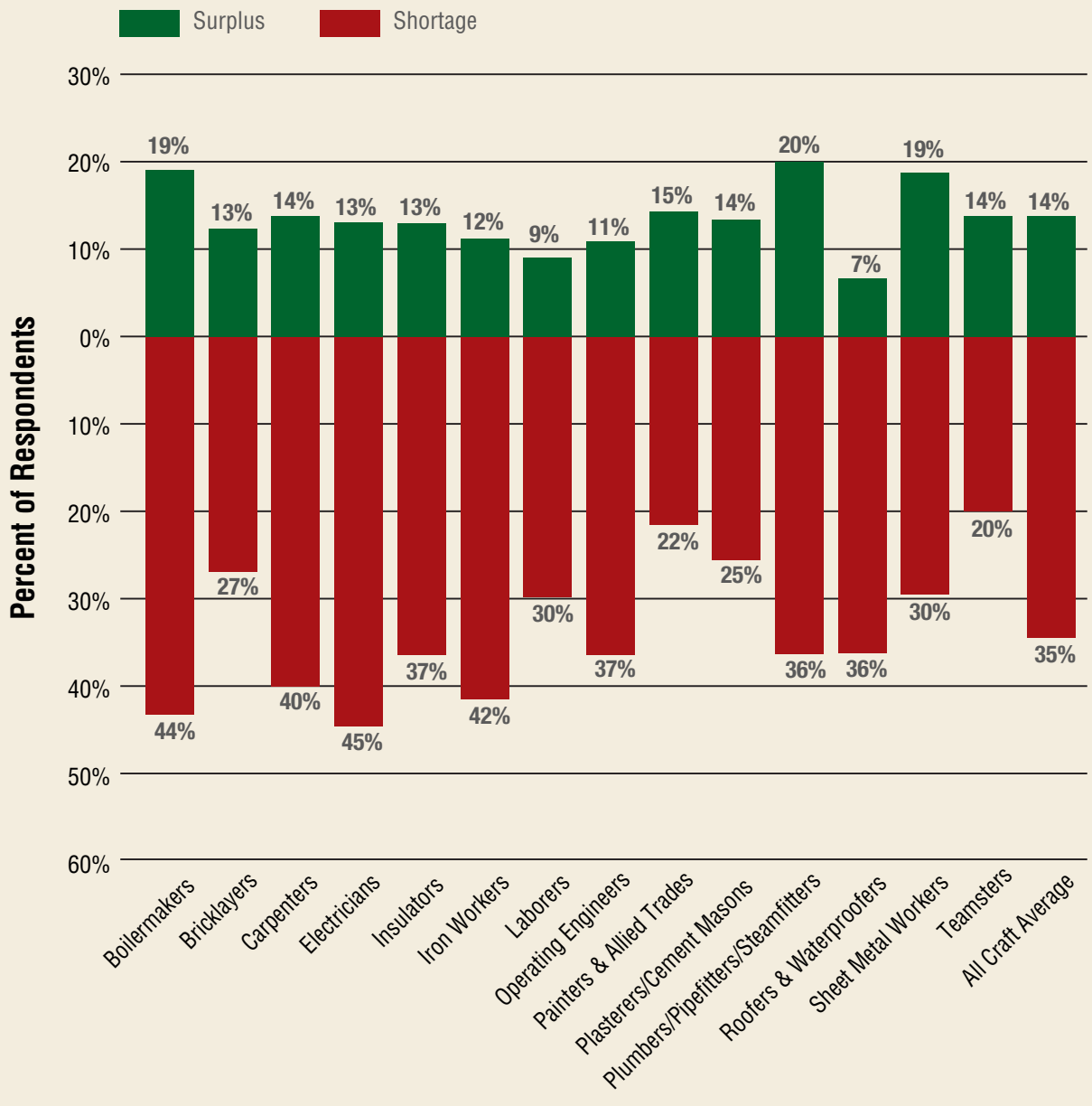
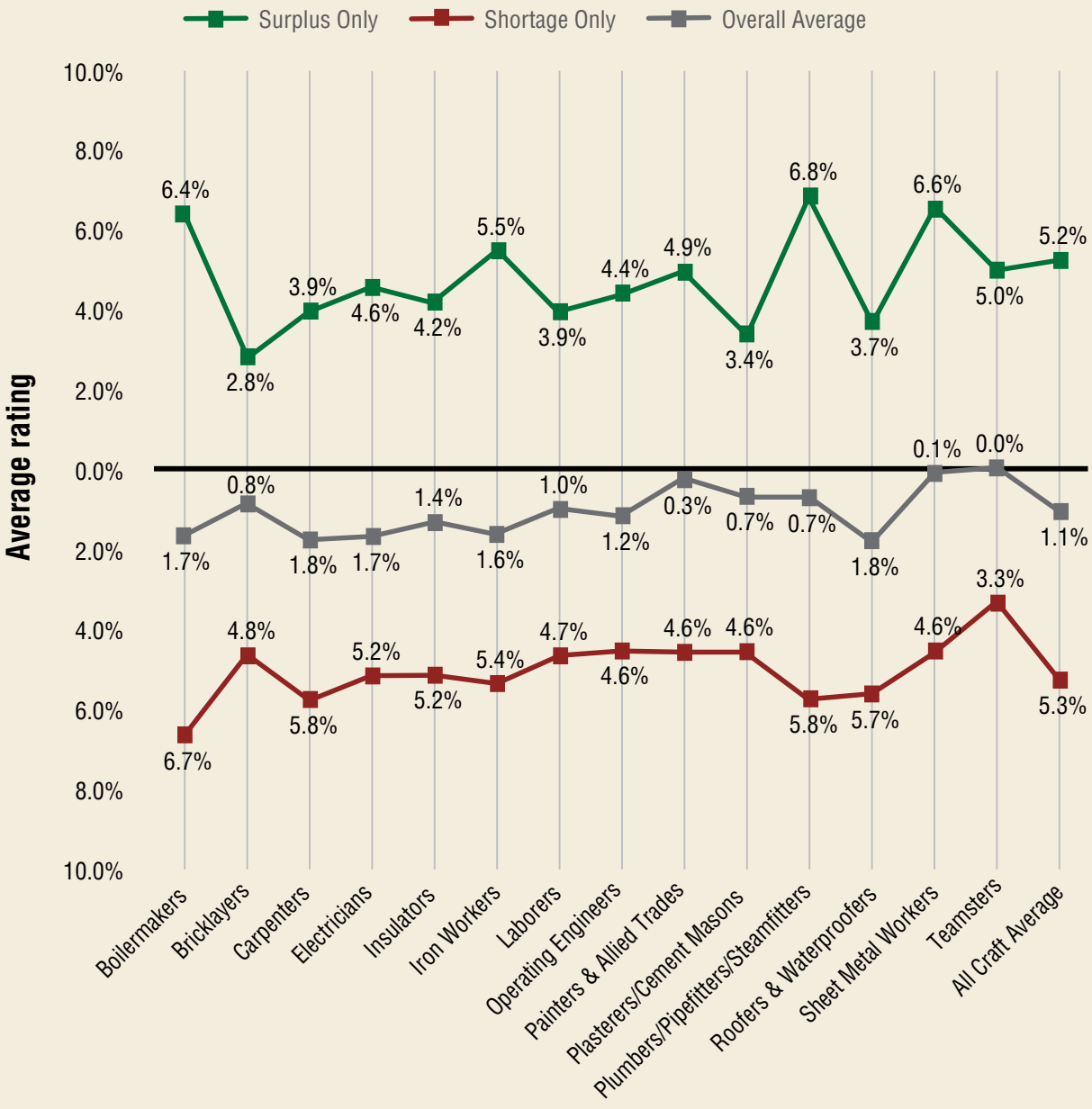


Exhibit 4.9 displays the degree of the union craft apprentice shortage/surplus in 2015. For those projecting a shortage, the average shortage was 5.3% in 2015. For those projecting a surplus, the degree of surplus was rated at 5.2%. The overall average was a shortage of 1.1%. (See earlier note regarding how this value can mask the degree of shortage/surplus experienced by individual organizations.)

Exhibit 4.9

Degree of shortage and surplus in 2015 by craft for apprentices



As shown in **Exhibit 4.10**, the percent saying they did not have a shortage or surplus of apprentices in 2015 ranged from 37% for Boilermakers to 66% for Teamsters. The all-craft average was 51%, meaning a little over half of the respondents thought their organization had about the right number of apprentices in 2015. And conversely, 49% indicated their organization did not have the right number of apprentices.

Exhibit 4.10
Percent of respondents projecting neither a shortage nor surplus in 2015 by craft for apprentices

Craft	No Shortage or Surplus
Boilermakers	37%
Bricklayers	61%
Carpenters	46%
Electricians	42%
Insulators	50%
Iron Workers	47%
Laborers	61%
Operating Engineers	52%
Painters & Allied Trades	64%
Plasterers/Cement Masons	61%
Plumbers/Pipefitters/Steamfitters	43%
Roofers & Waterproofers	57%
Sheet Metal Workers	51%
Teamsters	66%
All-Craft Average	**51%**

V. Summary and Key Findings

The study covered overall growth in construction and maintenance work opportunities (union and nonunion) and the labor supply for union craft workers, among other topics. A number of features make this study a timely and useful resource for those interested in the construction and maintenance industry.

- The population from which the large sample (N=792) was drawn is knowledgeable and engaged regarding the topic of craft labor supply.
- Respondents were instructed to describe their own experiences, not their perceptions of others' experiences or what they may have read, which should enhance the validity of the results.
- Thorough and detailed analyses of the data were conducted.
- A significant amount of craft-by-craft very specific results are presented in the body and appendix of the report.
- Detailed analyses, including data cuts by the four demographic variables (i.e., role, industry, region, organization size), are presented throughout the report.
- Many charts and graphs are included to make interpretation of the findings easy and accurate.

There are five key findings evident in the data.

1. Management vs. Labor

The results clearly show that management (i.e., association representatives, construction managers, contractors/subcontractors, owners/clients) had much less positive or optimistic evaluations than union/labor representatives. This was true for:

1) overall construction and maintenance growth projections (see **Section II, Exhibit 2.3**),
2) union craft labor supply (see **Section III, Exhibit 3.2**),
3) time taken to fill union craft jobs (see **Section III, Exhibits 3.7-3.10**) and
4) a large percent of the craft specific analyses (**Section VI, Exhibits 6.1-6.42**).

Stated differently, the union/labor contingent was the most positive about growth prospects, the least concerned about union craft labor shortages and rated the time lapse in filling union craft jobs the shortest. This theme was one of the most prominent throughout the study, and often the differences among the management roles and the union/labor role were large enough to achieve statistical significance ($p<.05$).

2. Growth in Construction and Maintenance Work Opportunities

Projections for growth in construction and maintenance work opportunities were still present in over half of the sample, but the optimism was tempered among some for 2016 compared to 2015. Even so, a plurality of respondents thought there would be very strong growth in 2016, so there was greater diversity in opinions about growth in work opportunities this year compared to last year.

3. Union Craft Labor Supply

The union craft labor supply, the crux of the study, showed about an even split between those who thought there was a shortage (52%) and those who thought there was not (i.e., either there was a surplus or the union craft labor supply in their organization was the right size).

About a fourth (23%) of the respondents reported a shortage of at least 4% in their organization. Carpenters, Plumbers/Pipefitters/Steamfitters and Electricians exhibited the largest shortage pervasiveness. Teamsters had the smallest percent of respondents reporting a shortage in their organization. Only three crafts—Boilermakers, Carpenters and Iron Workers—had a smaller reported shortage in 2016 than in 2015.

These results beg the questions: How do these results for the current time period (2015 and 2016) compare to other time periods? Are these results to be interpreted as benign, somewhat concerning or alarming? What are "normal" or baseline results to which these data can be benchmarked?

Since this is only the second year for this report, answers to those questions are not fully available. However, within a few short years trends will emerge and clearer answers to these questions will be available. In the meantime, even if not everyone reports a shortage, it can be stated that a labor shortage is still quite important for those who experience it. Moreover, a surplus can be problematic for those that report a surplus. Therefore, some sort of union craft labor supply issue or "problem" exists for well over half of the sample, whether it be a large or small shortage, or a surplus (Only 32% said their union craft labor staffing level was the right size.).

4. Industry Differences

The largest industry represented by far, commercial/institutional, had the second highest growth projections and the lowest worker shortage ratings. This suggests "better" health for this industry, relatively speaking, compared to the other industries. That does not mean individual organizations will not experience labor supply challenges, just that they may be less likely in the commercial/institutional sector than in other industries. Results for the second largest industry reported in the sample, utility, were somewhat counterintuitive in that low growth was projected yet it also carried the largest worker shortage evaluations for 2015.

5. Regional Variation

The greatest growth was projected for three of the four corners of the United States: New England, the Southeast and the Northwest. New England and the Southeast had elevated concerns regarding staffing levels compared to other regions; thus, combined with their stronger growth expectations, those regions may be expected to have some of the strongest challenges meeting union labor craft supply needs. The Northwest region had the fewest concerns (compared to the other regions) regarding adequate staffing, so that provides some labor supply relief since good growth was also projected there. The low growth prospects for the largest region, the East North Central region, were met with lower shortage ratings as well, so labor supplies may be less stressed there than other regions.

VI. Craft-Specific Results: Detailed

In **Section VI**, data are presented sequentially for three different topics for each craft—the crafts are presented in alphabetical order, each with three exhibits following the same pattern of results. The first topic (the first exhibit for each craft) has a chart showing the percent of respondents that rated each response option in the questionnaire regarding that craft's 2015 labor supply. This shows details about each craft's reported shortage/surplus of workers in 2015. The second topic (second exhibit) shows ratings for the projected 2016 labor supply for that craft. The third topic, apprentice levels in 2015, has an exhibit that illustrates findings for apprentice shortages/surpluses in 2015. The response options (horizontal x-axis) for all charts range from a -10% or greater (shortage) to a +10% or greater (surplus).

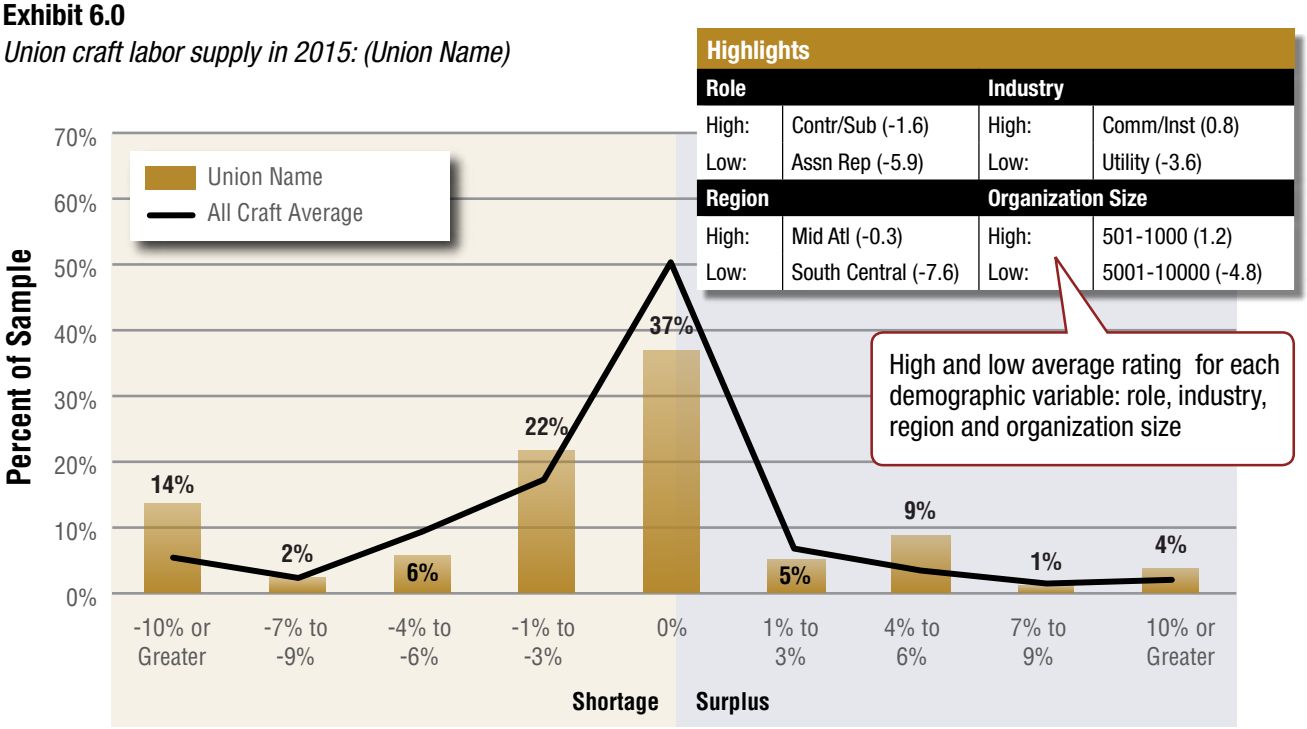
To illustrate, the first exhibit, **Exhibit 6.0**, is shown below as an example. The gold bars represent the percent of respondents that rated each response option for that craft. For example, 6% of the respondents thought there was a -4% to -6% shortage of *(Union Name)* in their organization in 2015. The average for all crafts combined for this response option is 10%, as shown by the black line.

The inset box provides additional drill down data for each respective chart. The box shows the high and low rating for the exhibit by each of the four demographic data cuts—role, industry, region and organization size. Thus, for **Exhibit 6.0**, contractors/subcontractors had the highest rating (-1.6%) and association executives the lowest (-5.9%). This means that, on average, all roles reported a shortage of *(Union Name)* in 2015 since there was no positive value; the smallest shortage (i.e., highest rating) was provided by contractors/subcontractors and the greatest shortage was reported by association representatives.

Example

Exhibit 6.0

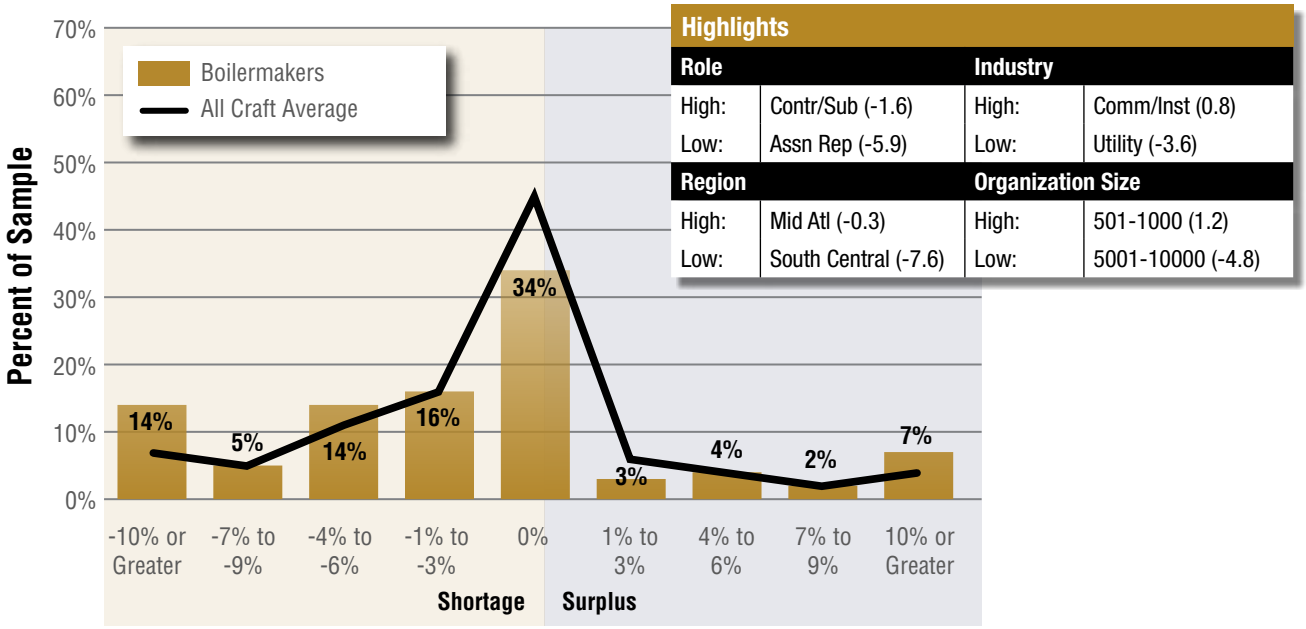
Union craft labor supply in 2015: (Union Name)



NOTE: the values in parentheses in the inset boxes represent the average shortage (negative values)/surplus (positive values) for that data cut. They do not represent the percent of respondents providing a certain response option, as is the case in the chart.

Exhibit 6.1

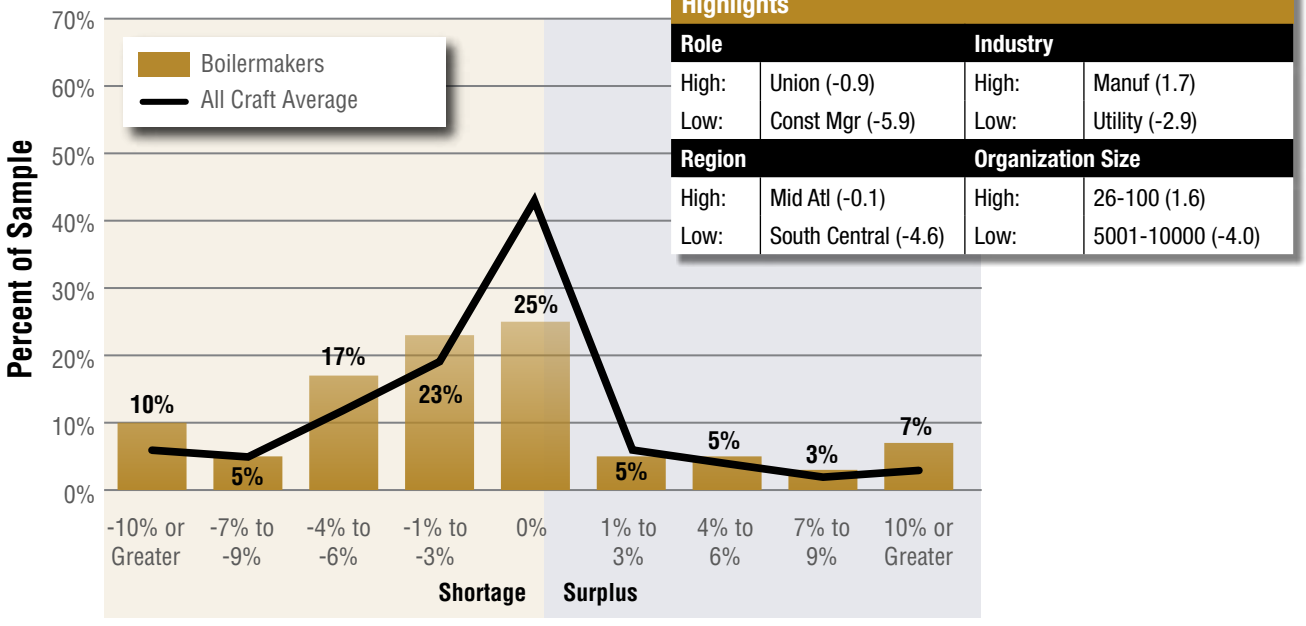
Union craft labor supply in 2015: Boilermakers



Highlights			
Role		**Industry**	
High:	Contr/Sub (-1.6)	High:	Comm/Inst (0.8)
Low:	Assn Rep (-5.9)	Low:	Utility (-3.6)
Region		**Organization Size**	
High:	Mid Atl (-0.3)	High:	501-1000 (1.2)
Low:	South Central (-7.6)	Low:	5001-10000 (-4.8)

Exhibit 6.2

Union craft labor supply in 2016: Boilermakers



Highlights			
Role		**Industry**	
High:	Union (-0.9)	High:	Manuf (1.7)
Low:	Const Mgr (-5.9)	Low:	Utility (-2.9)
Region		**Organization Size**	
High:	Mid Atl (-0.1)	High:	26-100 (1.6)
Low:	South Central (-4.6)	Low:	5001-10000 (-4.0)

Exhibit 6.3

Union craft labor supply in 2015 for apprentices: Boilermakers

Highlights			
Role		**Industry**	
High:	Owner (-0.9)	High:	Comm/Inst (0.4)
Low:	Assn Rep (-10.9)	Low:	Utility (-2.7)
Region		**Organization Size**	
High:	New Eng (-0.4)	High:	26-100 (2.6)
Low:	South Central (-4.3)	Low:	10000+ (-4.7)

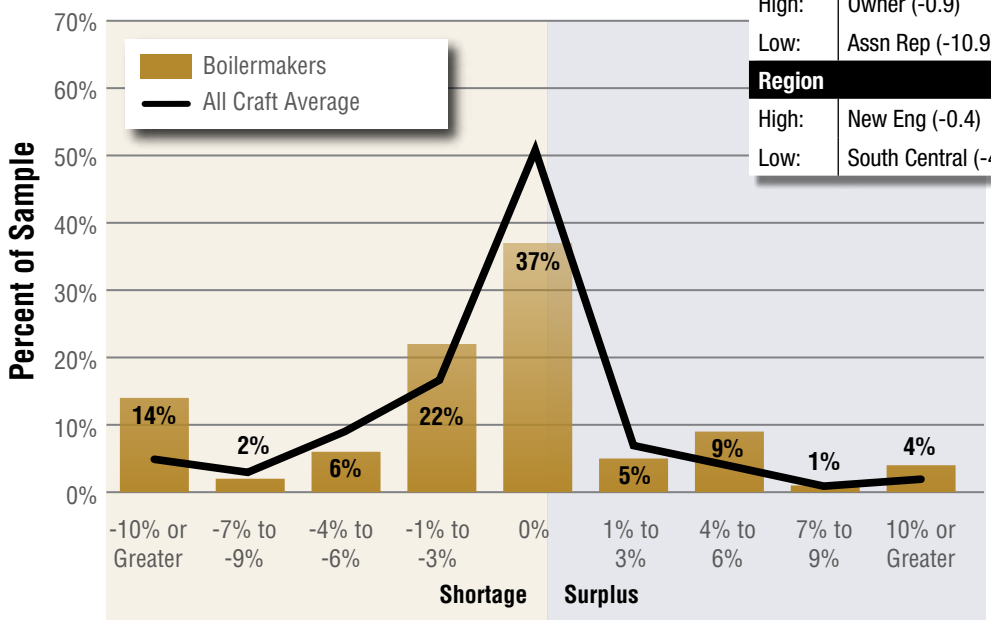


Exhibit 6.4

Union craft labor supply in 2015: Bricklayers

Highlights			
Role		**Industry**	
High:	Union (1.3)	High:	Utility (0.8)
Low:	Contr/Sub (-1.9)	Low:	Manuf (-2.3)
Region		**Organization Size**	
High:	Mid Atl (0.5)	High:	1001-5000 (1.8)
Low:	East N Central (-2.1)	Low:	26-100 (-2.1)

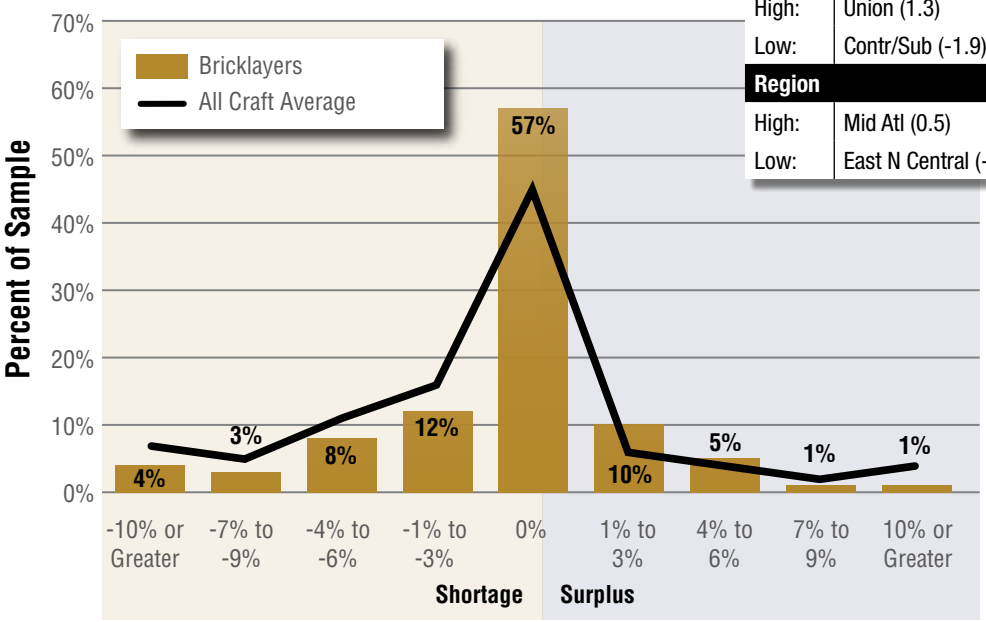


Exhibit 6.5

Union craft labor supply in 2016: Bricklayers

Highlights			
Role		**Industry**	
High:	Const Mgr (0.5)	High:	Utility (0.2)
Low:	Contr/Sub (-2.7)	Low:	Comm/Inst (-4.1)
Region		**Organization Size**	
High:	Southeast (-0.6)	High:	10000+ (-0.4)
Low:	East N Central (-2.5)	Low:	26-100 (-7.3)

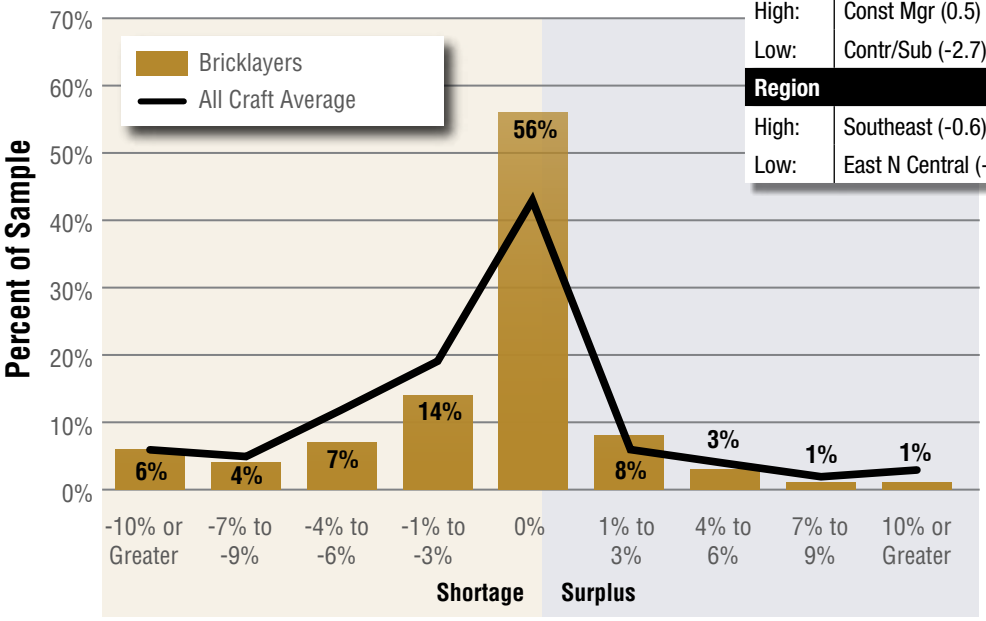
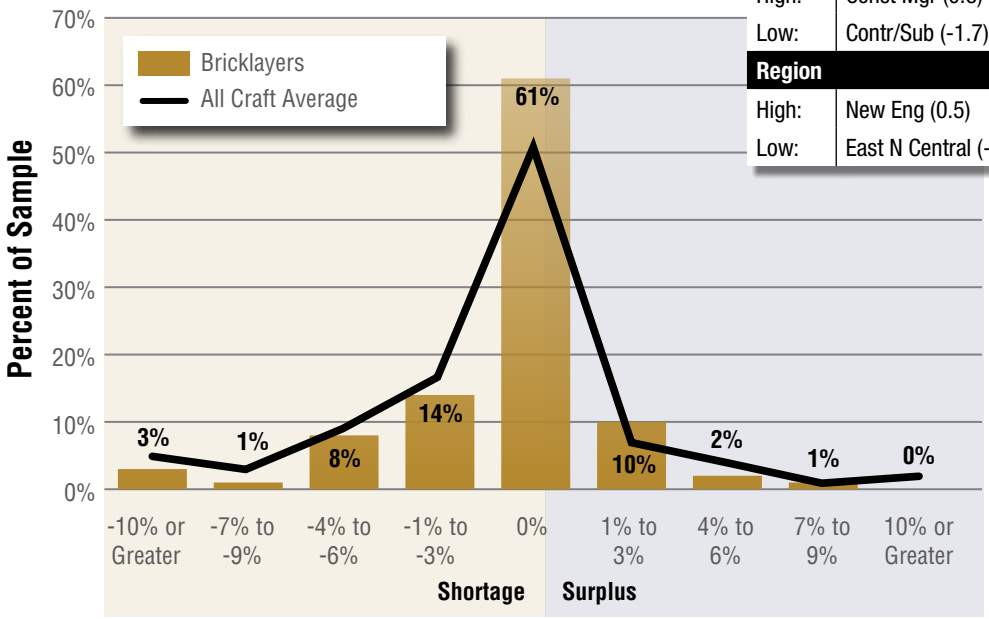


Exhibit 6.6

Union craft labor supply in 2015 for apprentices: Bricklayers



Highlights			
Role		**Industry**	
High:	Const Mgr (0.3)	High:	Utility (0.2)
Low:	Contr/Sub (-1.7)	Low:	Comm/Inst (-2.8)
Region		**Organization Size**	
High:	New Eng (0.5)	High:	10000+ (0.0)
Low:	East N Central (-2.0)	Low:	26-100 (-4.5)

Exhibit 6.7

Union craft labor supply in 2015: Carpenters

Highlights			
Role		**Industry**	
High:	Union (1.1)	High:	Comm/Inst (0.2)
Low:	Contr/Sub (-3.8)	Low:	Manuf (-4.3)
Region		**Organization Size**	
High:	Southwest (-0.2)	High:	26-100 (0.5)
Low:	Southeast (-4.8)	Low:	5001-10000 (-5.5)

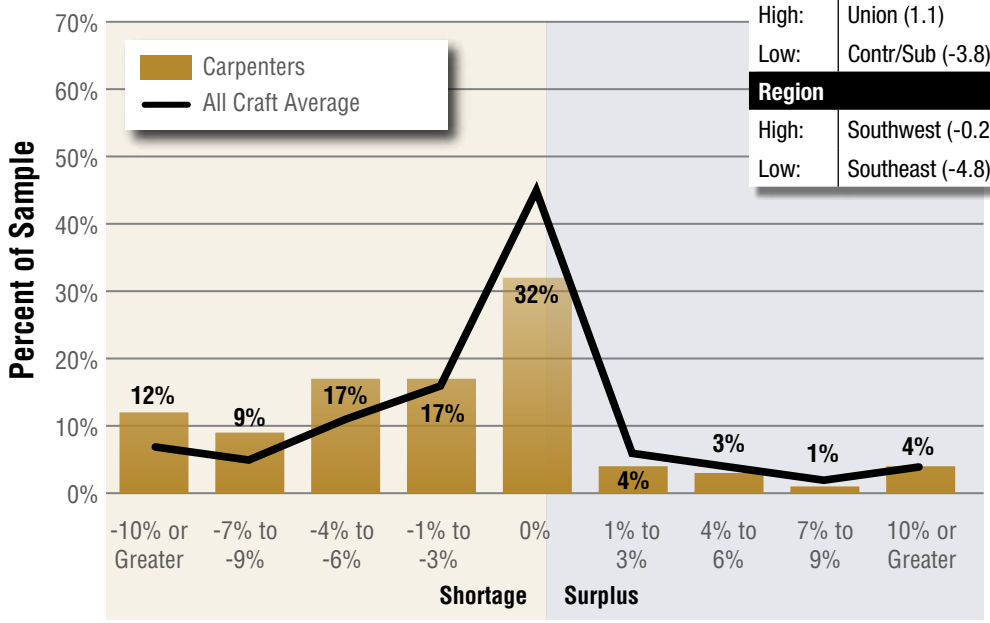


Exhibit 6.8

Union craft labor supply in 2016: Carpenters

Highlights			
Role		**Industry**	
High:	Union (1.2)	High:	Civil (0.0)
Low:	Contr/Sub (-3.6)	Low:	Manuf (-4.1)
Region		**Organization Size**	
High:	Mtn N Plains (1.0)	High:	26-100 (-0.2)
Low:	South Central (-4.6)	Low:	5001-10000 (-5.4)

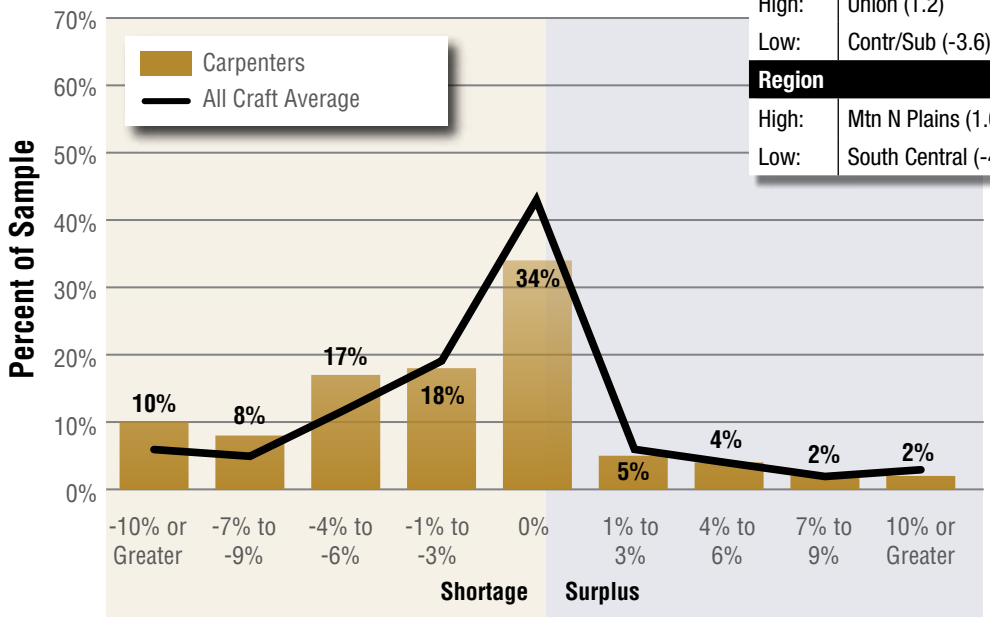
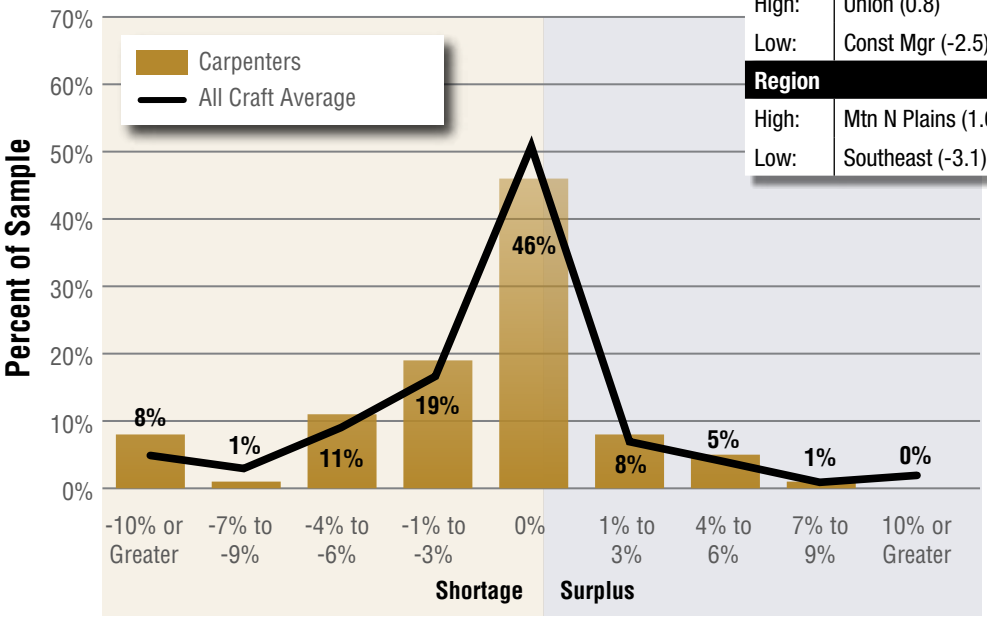


Exhibit 6.9

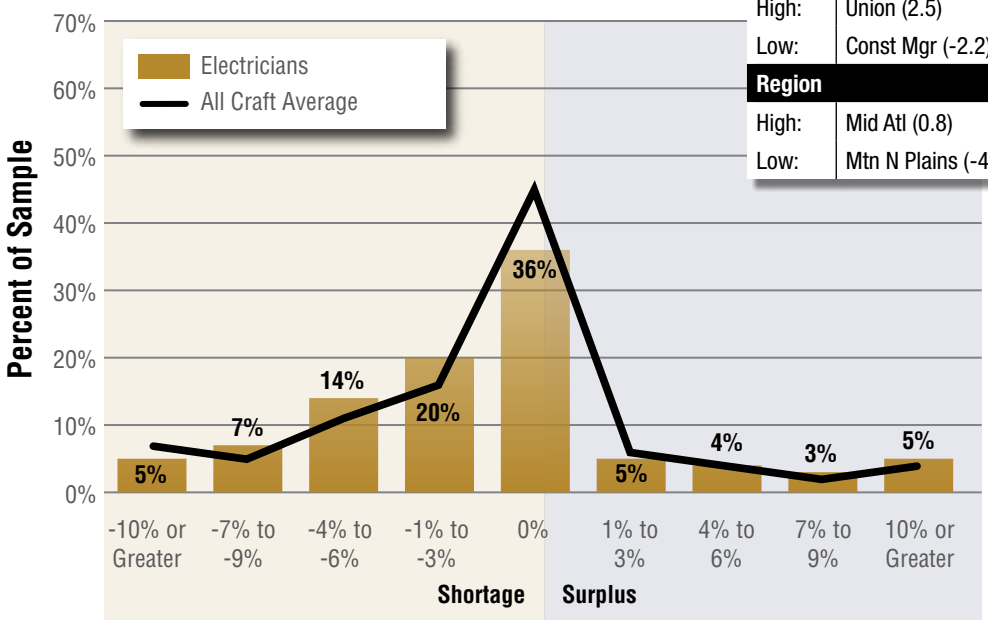
Union craft labor supply in 2015 for apprentices: Carpenters



Highlights			
Role		**Industry**	
High:	Union (0.8)	High:	Comm/Inst (0.9)
Low:	Const Mgr (-2.5)	Low:	Manuf (-2.9)
Region		**Organization Size**	
High:	Mtn N Plains (1.0)	High:	26-100 (0.0)
Low:	Southeast (-3.1)	Low:	5001-10000 (-3.6)

Exhibit 6.10

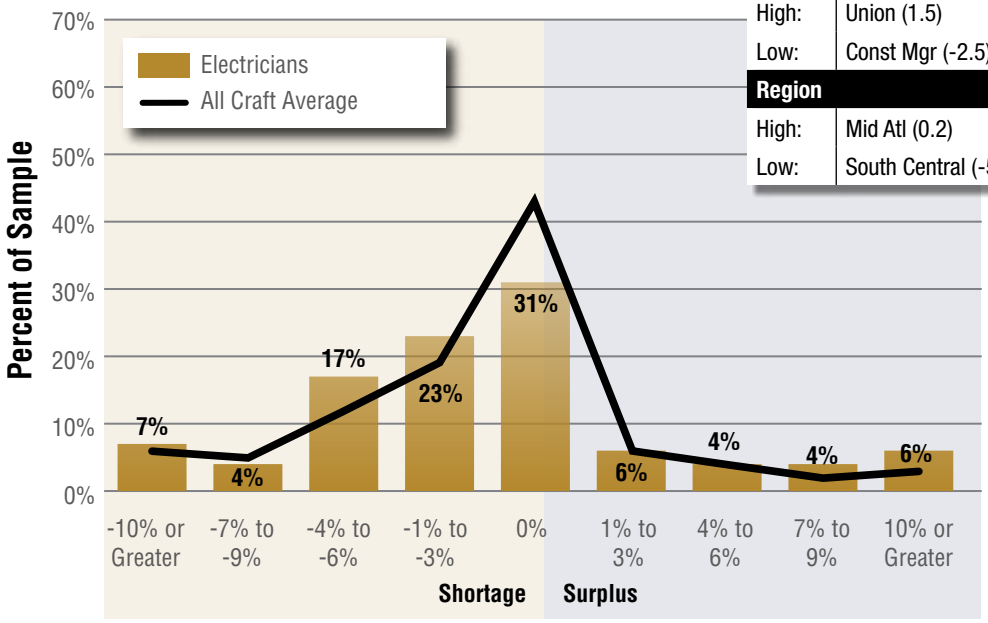
Union craft labor supply in 2015: Electricians



Highlights			
Role		**Industry**	
High:	Union (2.5)	High:	Comm/Inst (2.4)
Low:	Const Mgr (-2.2)	Low:	Manuf (-2.5)
Region		**Organization Size**	
High:	Mid Atl (0.8)	High:	1-25 (0.8)
Low:	Mtn N Plains (-4.6)	Low:	101-500 (-1.8)

Exhibit 6.11

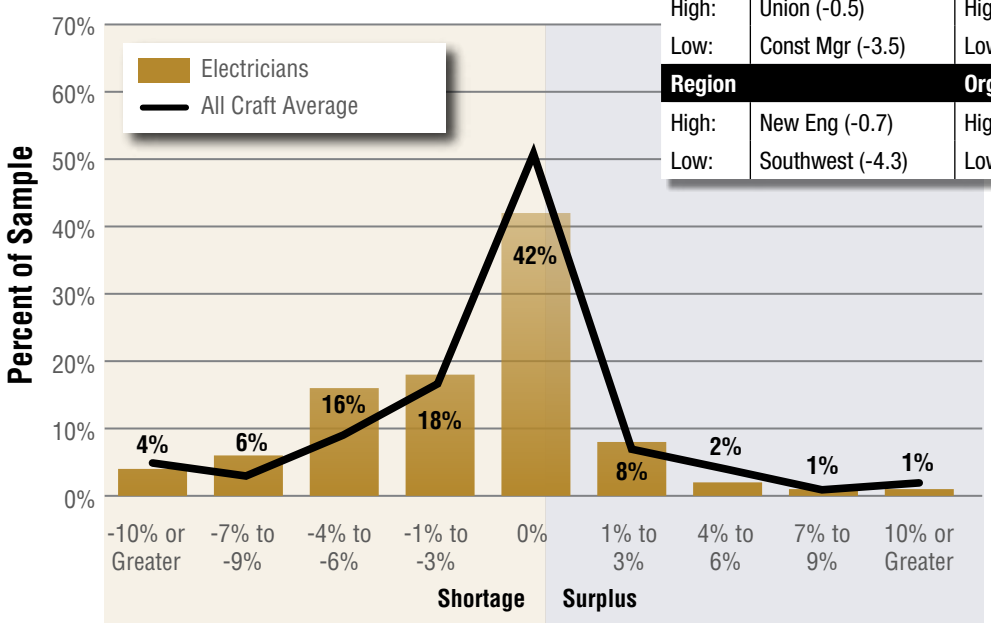
Union craft labor supply in 2016: Electricians



Highlights			
Role		**Industry**	
High:	Union (1.5)	High:	Comm/Inst (1.8)
Low:	Const Mgr (-2.5)	Low:	Manuf (-4.5)
Region		**Organization Size**	
High:	Mid Atl (0.2)	High:	26-100 (2.3)
Low:	South Central (-5.7)	Low:	101-500 (-2.8)

Exhibit 6.12

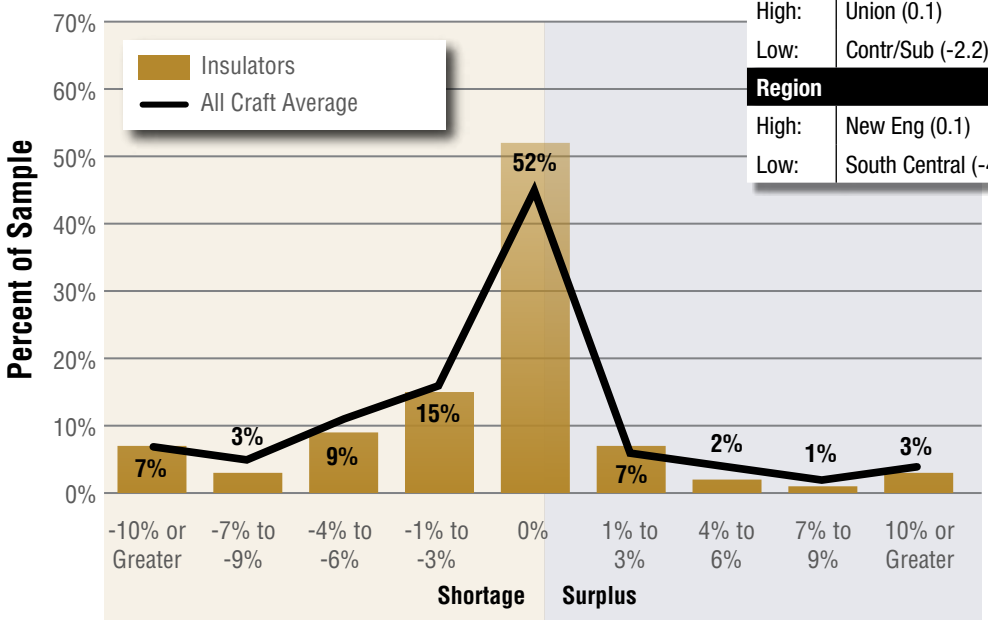
Union craft labor supply in 2015 for apprentices: Electricians



Highlights			
Role		**Industry**	
High:	Union (-0.5)	High:	Comm/Inst (-0.5)
Low:	Const Mgr (-3.5)	Low:	Manuf (-2.8)
Region		**Organization Size**	
High:	New Eng (-0.7)	High:	26-100 (0.8)
Low:	Southwest (-4.3)	Low:	101-500 (-3.2)

Exhibit 6.13

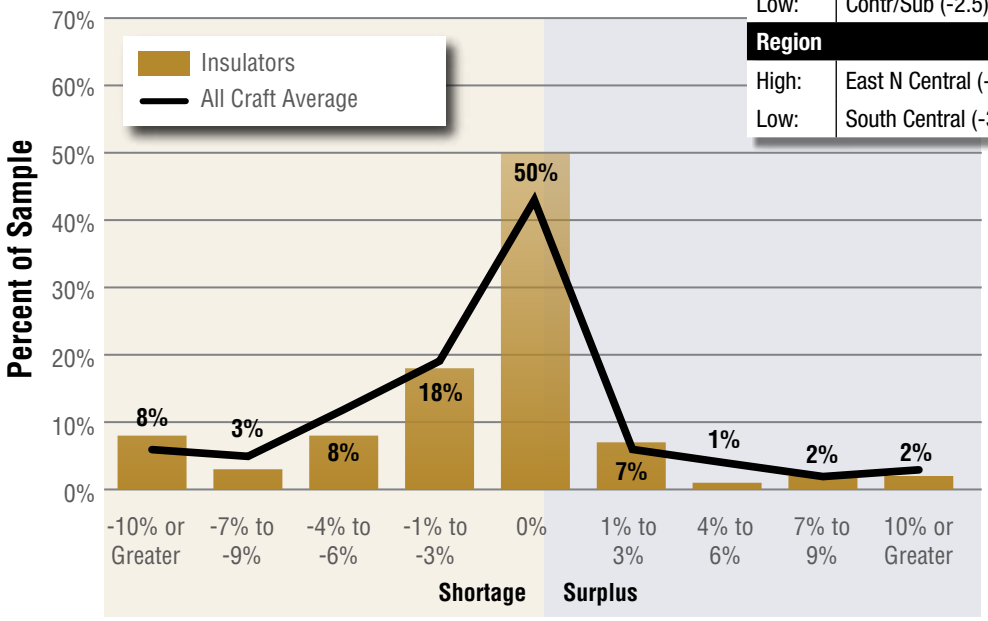
Union craft labor supply in 2015: Insulators



Highlights			
Role		**Industry**	
High:	Union (0.1)	High:	Petro/Chem (-0.4)
Low:	Contr/Sub (-2.2)	Low:	Utility (-2.0)
Region		**Organization Size**	
High:	New Eng (0.1)	High:	26-100 (0.0)
Low:	South Central (-4.1)	Low:	1-25 (-7.7)

Exhibit 6.14

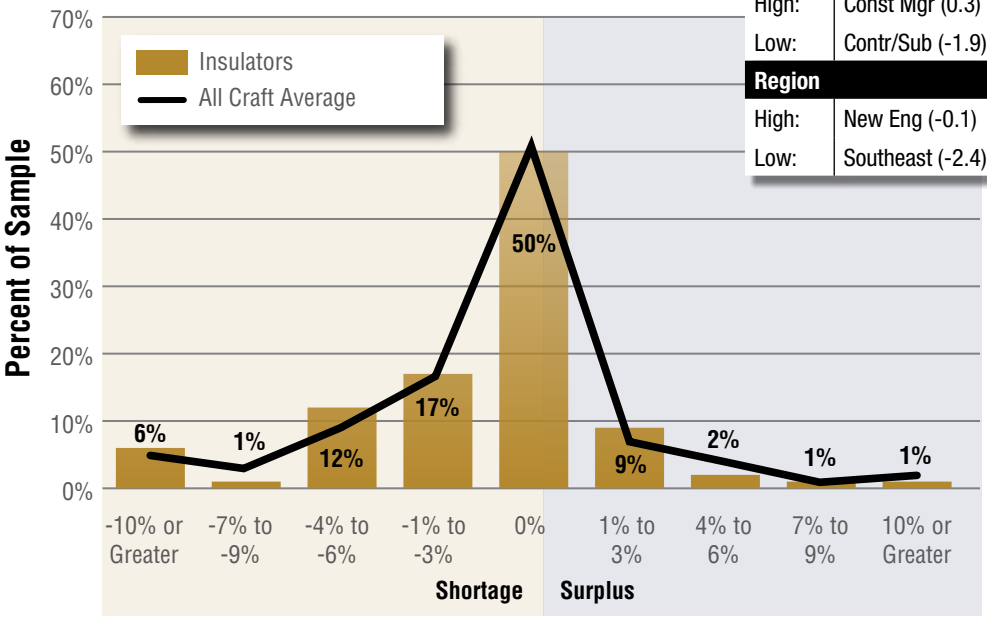
Union craft labor supply in 2016: Insulators



Highlights			
Role		**Industry**	
High:	Const Mgr (0.2)	High:	Manuf (-1.1)
Low:	Contr/Sub (-2.5)	Low:	Utility (-2.1)
Region		**Organization Size**	
High:	East N Central (-0.3)	High:	26-100 (3.7)
Low:	South Central (-3.1)	Low:	1-25 (-6.9)

Exhibit 6.15

Union craft labor supply in 2015 for apprentices: Insulators



Highlights			
Role		**Industry**	
High:	Const Mgr (0.3)	High:	Utility (-1.1)
Low:	Contr/Sub (-1.9)	Low:	Petro/Chem (-2.1)
Region		**Organization Size**	
High:	New Eng (-0.1)	High:	26-100 (2.4)
Low:	Southeast (-2.4)	Low:	1-25 (-5.0)

Exhibit 6.16

Union craft labor supply in 2015: Iron Workers

Highlights			
Role		**Industry**	
High:	Union (0.9)	High:	Petro/Chem (-0.2)
Low:	Contr/Sub (-3.2)	Low:	Manuf (-4.0)
Region		**Organization Size**	
High:	Mid Atl (0.5)	High:	10000+ (-0.5)
Low:	Southeast (-4.2)	Low:	501-1000 (-3.4)

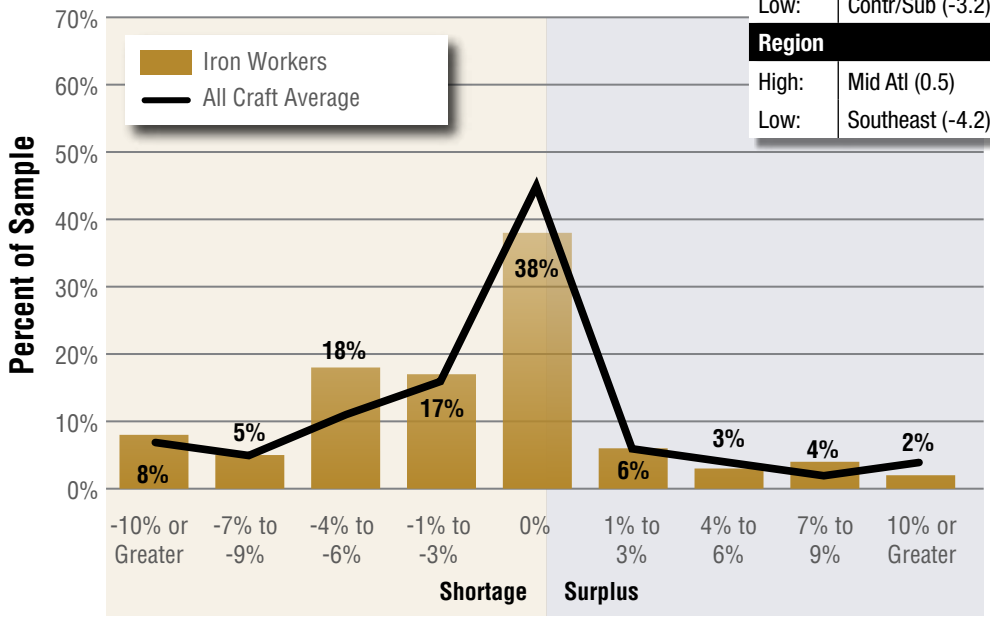


Exhibit 6.17

Union craft labor supply in 2016: Iron Workers

Highlights			
Role		**Industry**	
High:	Union (0.5)	High:	Petro/Chem (0.0)
Low:	Const Mgr (-2.4)	Low:	Manuf (-3.6)
Region		**Organization Size**	
High:	Mid Atl (0.2)	High:	26-100 (1.5)
Low:	Southeast (-3.4)	Low:	501-1000 (-3.8)

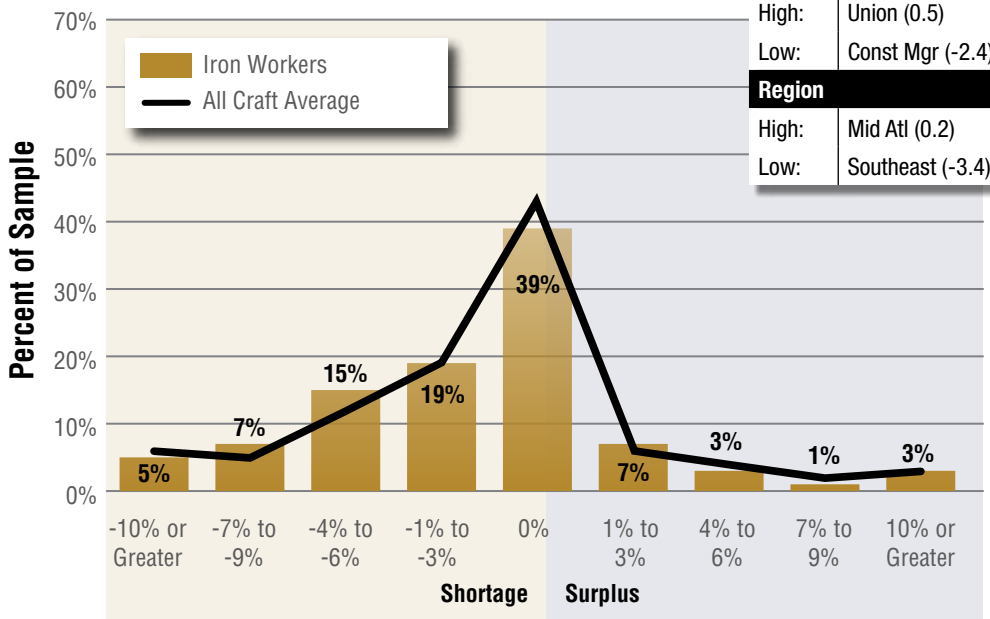
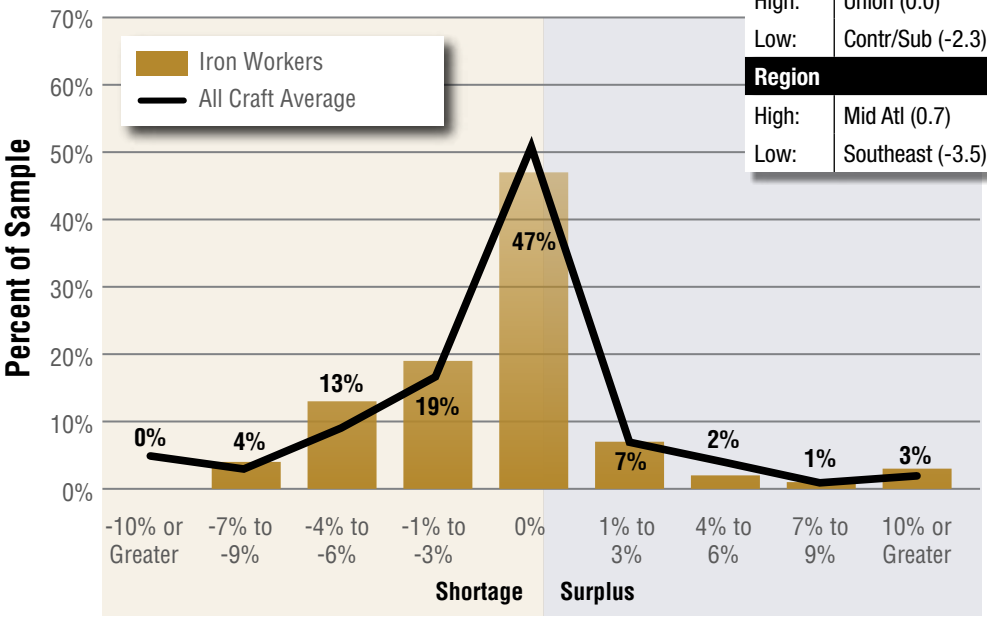


Exhibit 6.18

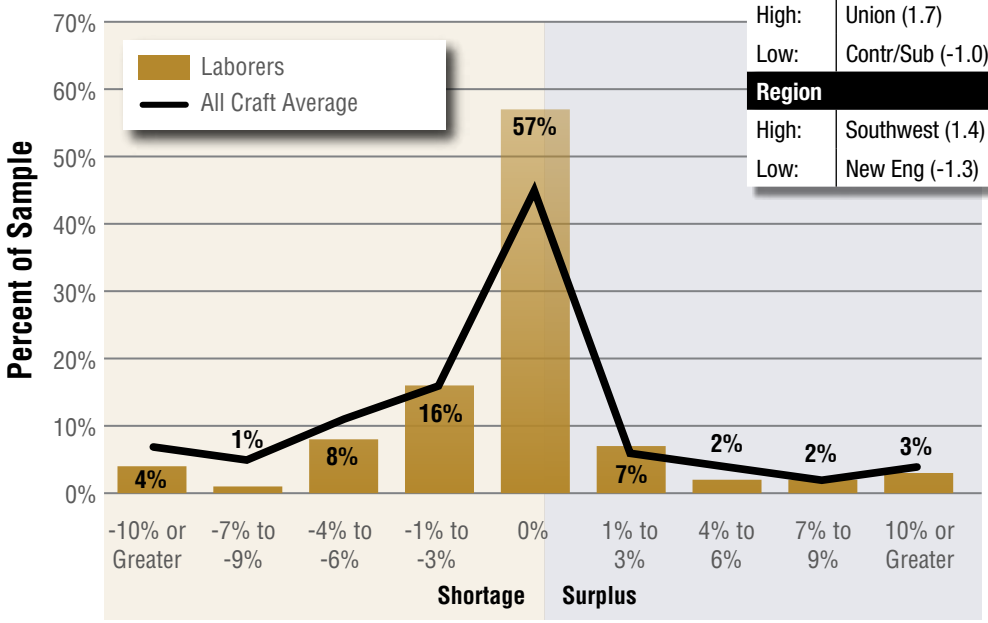
Union craft labor supply in 2015 for apprentices: Iron Workers



Highlights			
Role		**Industry**	
High:	Union (0.0)	High:	Petro/Chem (0.1)
Low:	Contr/Sub (-2.3)	Low:	Manuf (-4.2)
Region		**Organization Size**	
High:	Mid Atl (0.7)	High:	26-100 (1.1)
Low:	Southeast (-3.5)	Low:	501-1000 (-3.0)

Exhibit 6.19

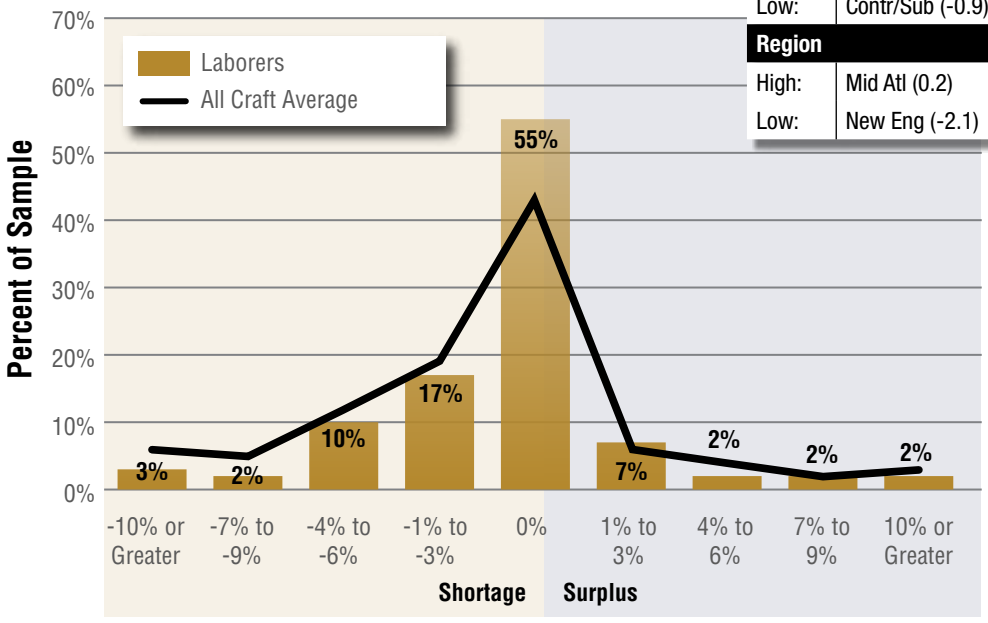
Union craft labor supply in 2015: Laborers



Highlights			
Role		**Industry**	
High:	Union (1.7)	High:	Civil (1.8)
Low:	Contr/Sub (-1.0)	Low:	Comm/Inst (-1.8)
Region		**Organization Size**	
High:	Southwest (1.4)	High:	1001-5000 (0.7)
Low:	New Eng (-1.3)	Low:	1-25 (-4.2)

Exhibit 6.20

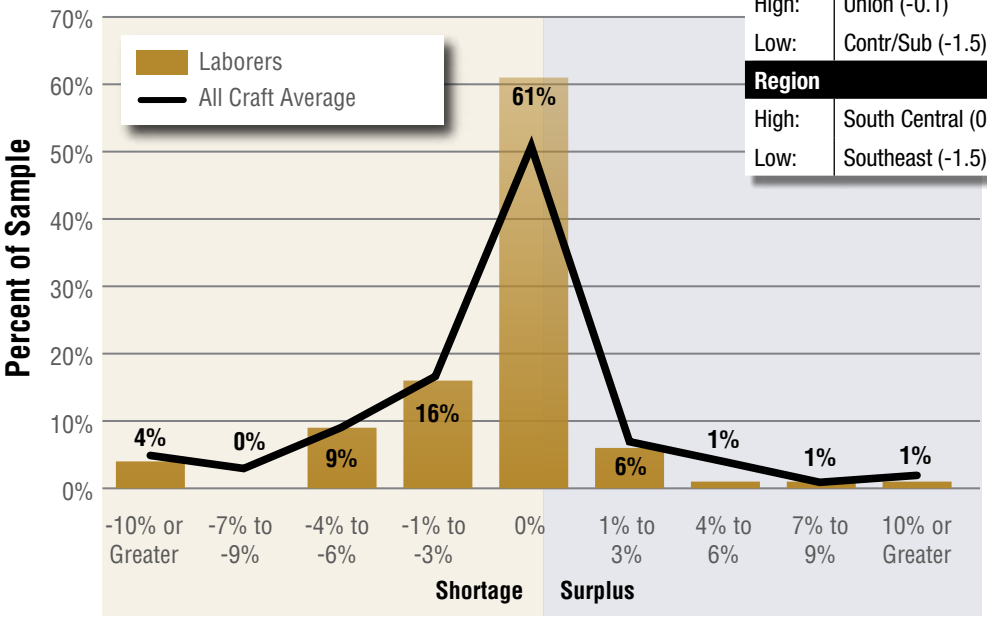
Union craft labor supply in 2016: Laborers



Highlights			
Role		**Industry**	
High:	Union (0.2)	High:	Civil (2.3)
Low:	Contr/Sub (-0.9)	Low:	Comm/Inst (-2.9)
Region		**Organization Size**	
High:	Mid Atl (0.2)	High:	26-100 (1.8)
Low:	New Eng (-2.1)	Low:	1-25 (-4.9)

Exhibit 6.21

Union craft labor supply in 2015 for apprentices: Laborers



Highlights			
Role		**Industry**	
High:	Union (-0.1)	High:	Civil (1.1)
Low:	Contr/Sub (-1.5)	Low:	Comm/Inst (-4.1)
Region		**Organization Size**	
High:	South Central (0.0)	High:	1001-5000 (0.3)
Low:	Southeast (-1.5)	Low:	1-25 (-6.7)

Exhibit 6.22

Union craft labor supply in 2015: Operating Engineers

Highlights			
Role		**Industry**	
High:	Owner (0.1)	High:	Petro/Chem (-0.8)
Low:	Contr/Sub (-2.5)	Low:	Utility (-1.9)
Region		**Organization Size**	
High:	Mid Atl (-0.4)	High:	26-100 (-0.9)
Low:	South Central (-3.5)	Low:	1-25 (-5.7)

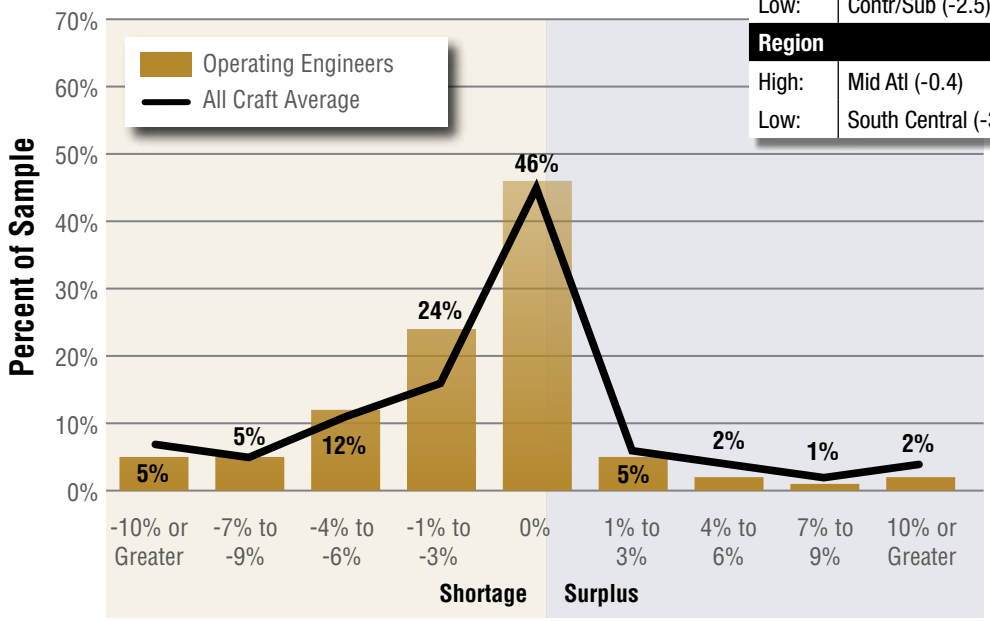


Exhibit 6.23

Union craft labor supply in 2016: Operating Engineers

Highlights			
Role		**Industry**	
High:	Owner (-0.3)	High:	Petro/Chem (0.0)
Low:	Contr/Sub (-2.0)	Low:	Manuf (-2.3)
Region		**Organization Size**	
High:	Mid Atl (-0.4)	High:	26-100 (3.0)
Low:	New Eng (-3.2)	Low:	1-25 (-4.8)

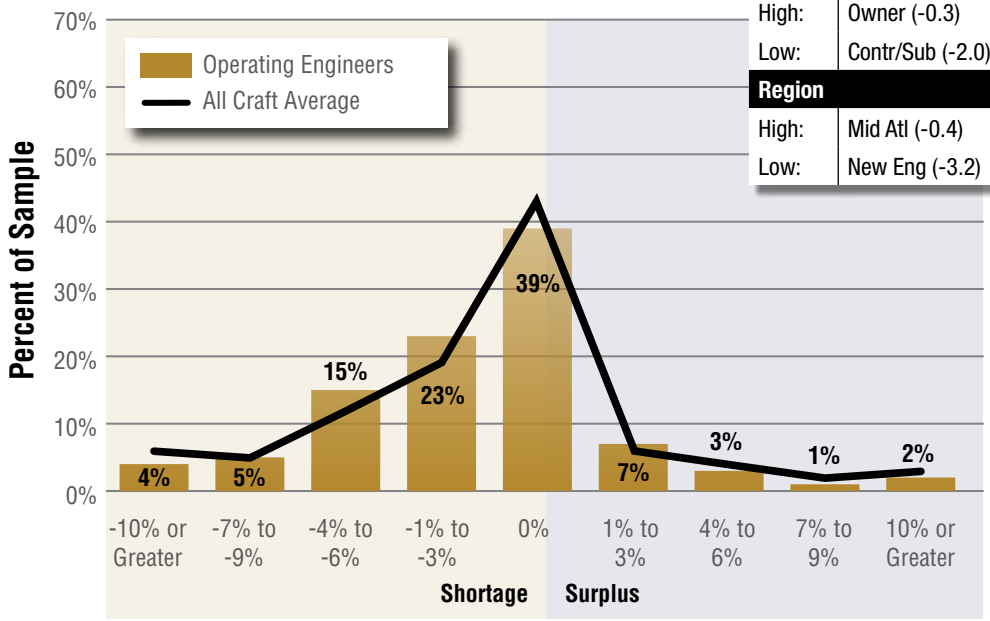


Exhibit 6.24

Union craft labor supply in 2015 for apprentices: Operating Engineers

Highlights			
Role		**Industry**	
High:	Const Mgr (1.5)	High:	Petro/Chem (-0.1)
Low:	Contr/Sub (-1.9)	Low:	Manuf (-2.0)
Region		**Organization Size**	
High:	Mid Atl (-0.2)	High:	1001-5000 (-0.3)
Low:	Southeast (-2.6)	Low:	1-25 (-2.8)

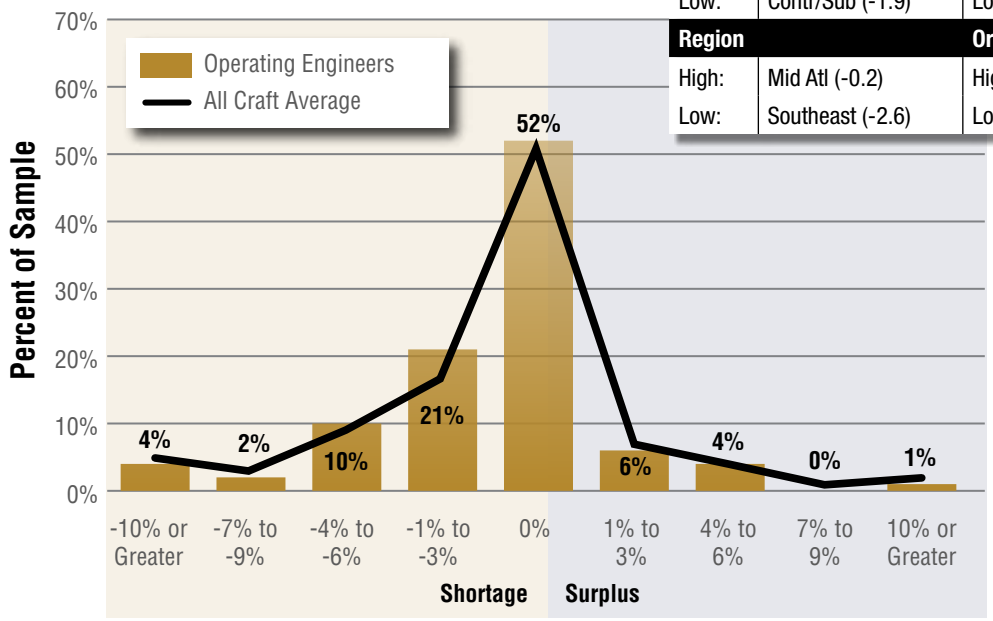
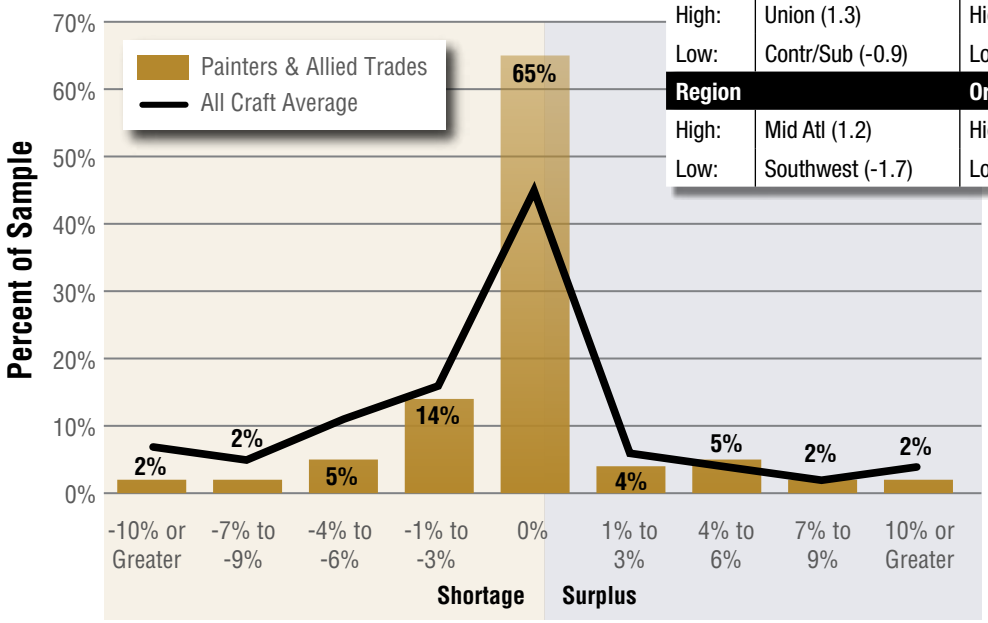


Exhibit 6.25

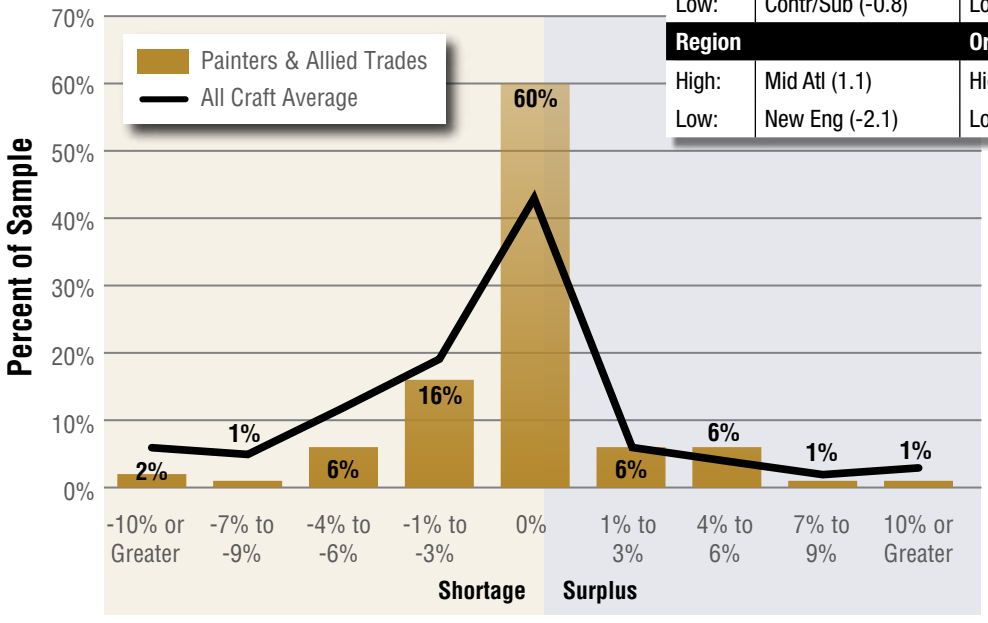
Union craft labor supply in 2015: Painters & Allied Trades



Highlights			
Role		**Industry**	
High:	Union (1.3)	High:	Utility (1.0)
Low:	Contr/Sub (-0.9)	Low:	Manuf (-1.2)
Region		**Organization Size**	
High:	Mid Atl (1.2)	High:	1001-5000 (0.75)
Low:	Southwest (-1.7)	Low:	501-1000 (-1.3)

Exhibit 6.26

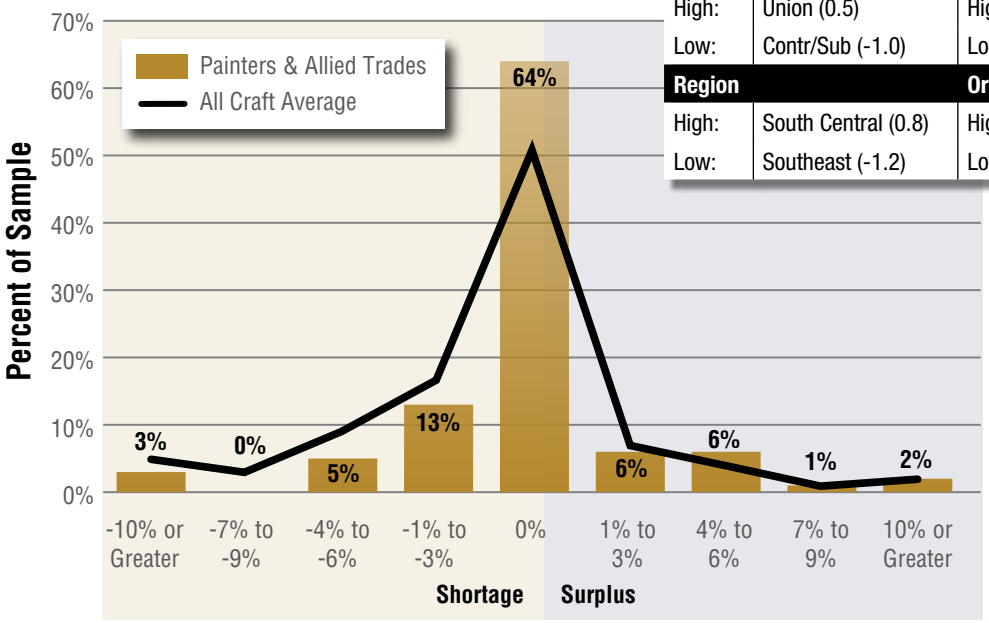
Union craft labor supply in 2016: Painters & Allied Trades



Highlights			
Role		**Industry**	
High:	Union (0.6)	High:	Utility (1.0)
Low:	Contr/Sub (-0.8)	Low:	Manuf (-1.8)
Region		**Organization Size**	
High:	Mid Atl (1.1)	High:	101-500 (1.5)
Low:	New Eng (-2.1)	Low:	501-1000 (-1.3)

Exhibit 6.27

Union craft labor supply in 2015 for apprentices: Painters & Allied Trades



Highlights			
Role		**Industry**	
High:	Union (0.5)	High:	Utility (1.0)
Low:	Contr/Sub (-1.0)	Low:	Petro/Chem (-1.5)
Region		**Organization Size**	
High:	South Central (0.8)	High:	101-500 (1.3)
Low:	Southeast (-1.2)	Low:	26-100 (-5.0)

Exhibit 6.28

Union craft labor supply in 2015: Plasterers/Cement Masons

Highlights			
Role		**Industry**	
High:	Union (1.9)	High:	Utility (1.1)
Low:	Contr/Sub (-1.3)	Low:	Manuf (-2.5)
Region		**Organization Size**	
High:	New Eng (0.9)	High:	1001-5000 (1.1)
Low:	Southeast (-1.1)	Low:	501-1000 (-2.2)

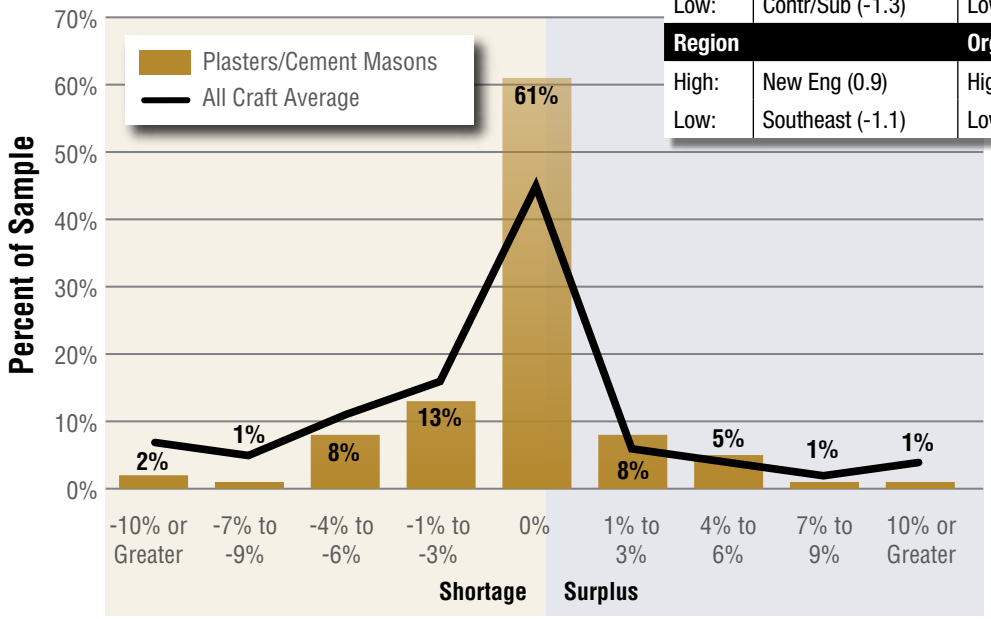


Exhibit 6.29

Union craft labor supply in 2016: Plasterers/Cement Masons

Highlights			
Role		**Industry**	
High:	Union (1.2)	High:	Utility (0.6)
Low:	Contr/Sub (-1.7)	Low:	Manuf (-2.1)
Region		**Organization Size**	
High:	Mid Atl (0.0)	High:	101-500 (0.5)
Low:	Southeast (-1.5)	Low:	501-1000 (-2.1)

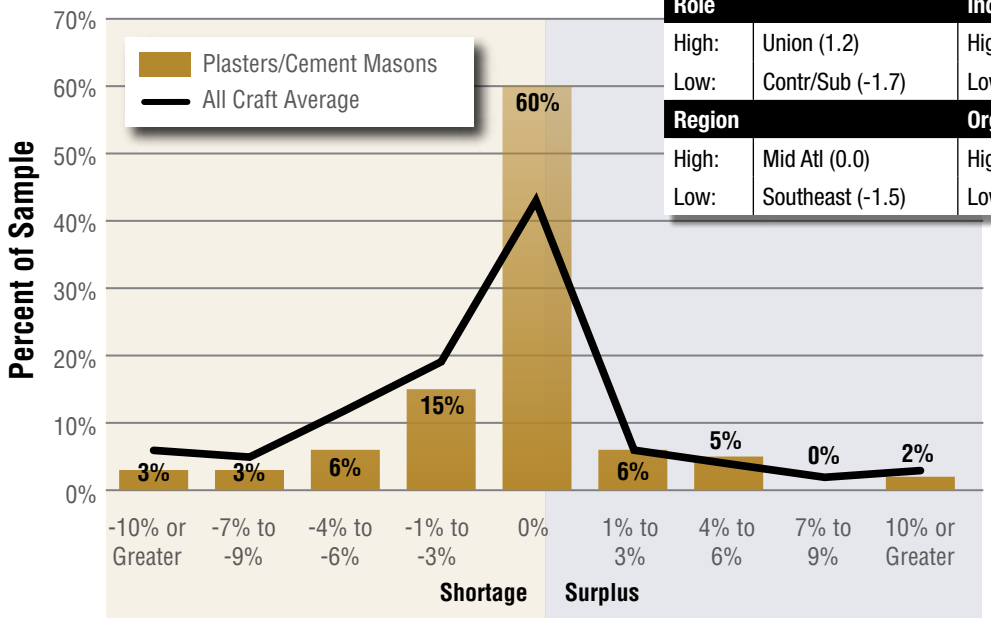
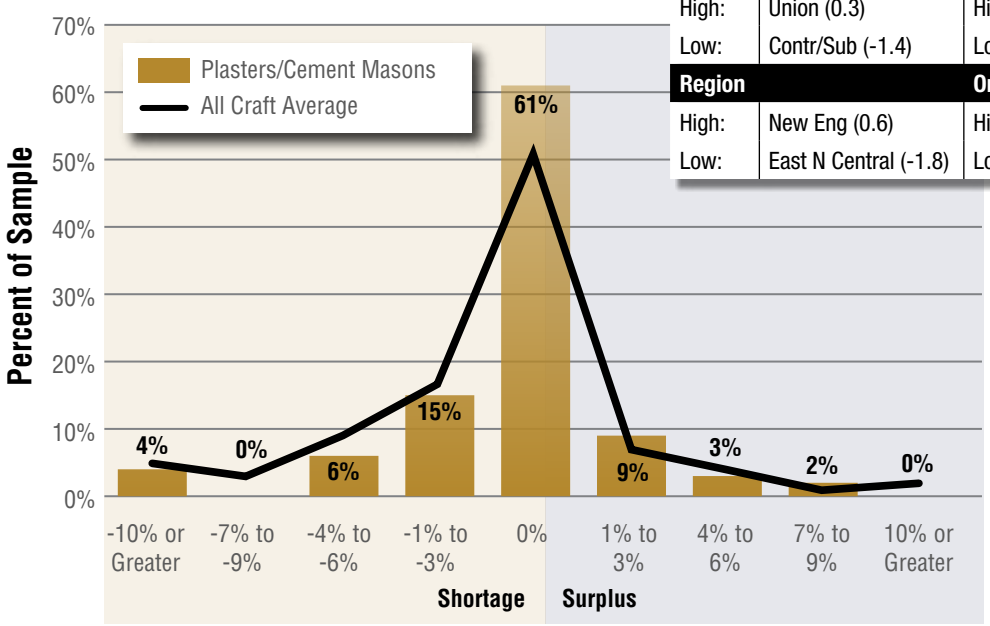


Exhibit 6.30

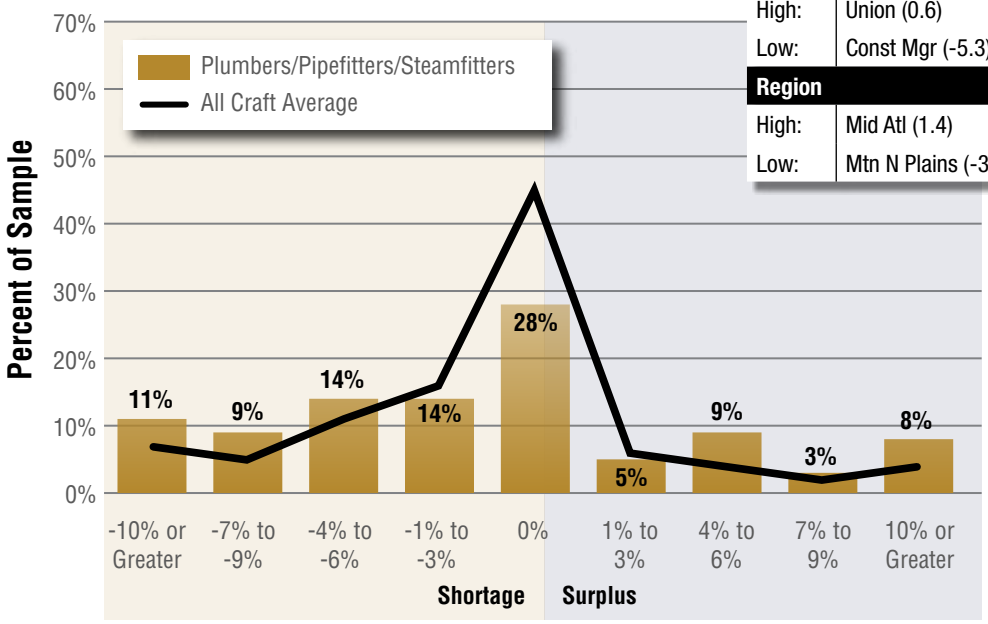
Union craft labor supply in 2015 for apprentices: Plasterers/Cement Masons



Highlights			
Role		**Industry**	
High:	Union (0.3)	High:	Utility (0.6)
Low:	Contr/Sub (-1.4)	Low:	Comm/Inst (-1.9)
Region		**Organization Size**	
High:	New Eng (0.6)	High:	5001-10000 (0.0)
Low:	East N Central (-1.8)	Low:	501-1000 (-1.8)

Exhibit 6.31

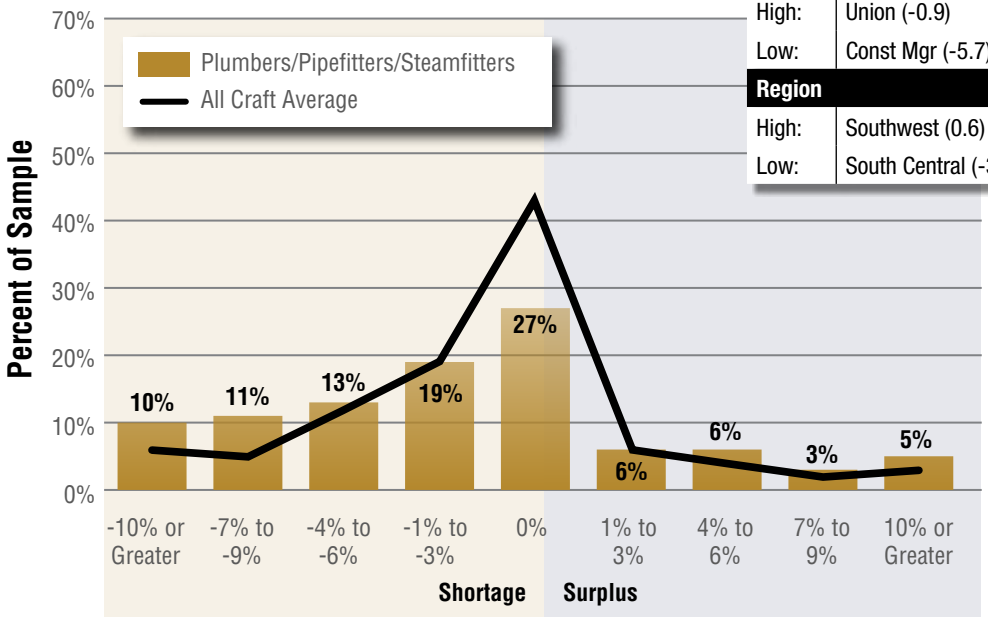
Union craft labor supply in 2015: Plumbers/Pipefitters/Steamfitters



Highlights			
Role		**Industry**	
High:	Union (0.6)	High:	Comm/Inst (1.4)
Low:	Const Mgr (-5.3)	Low:	Utility (-5.0)
Region		**Organization Size**	
High:	Mid Atl (1.4)	High:	26-100 (1.5)
Low:	Mtn N Plains (-3.1)	Low:	5001-10000 (-2.9)

Exhibit 6.32

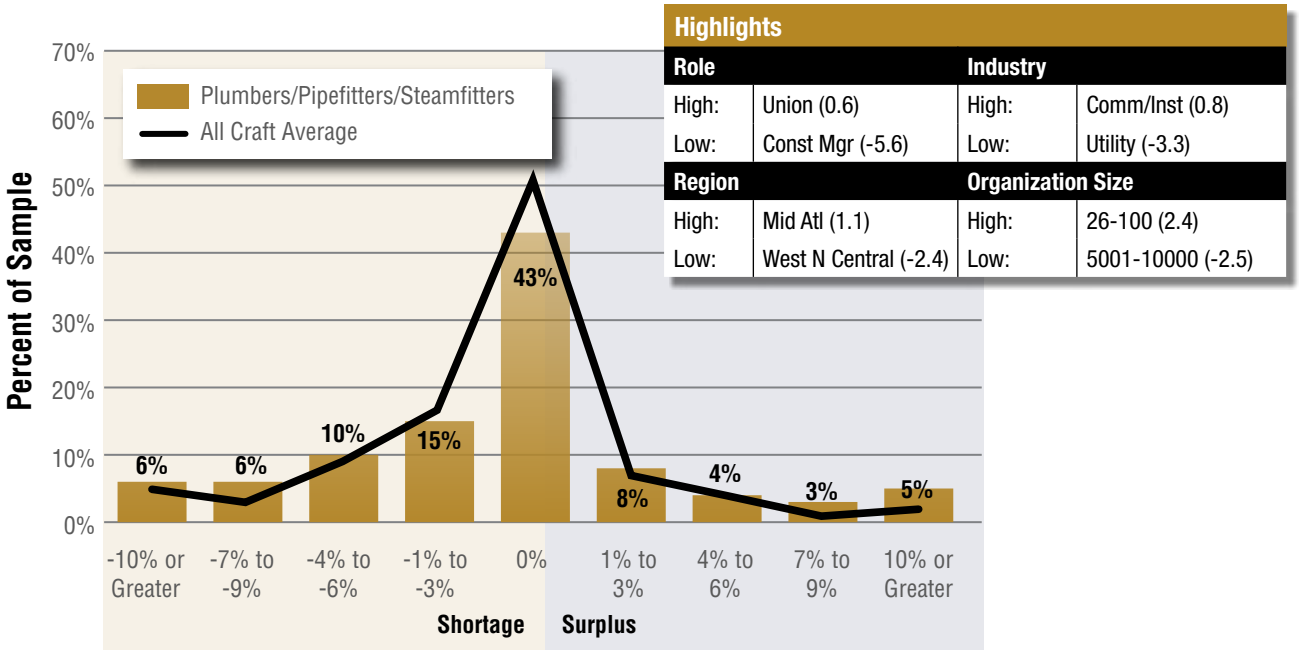
Union craft labor supply in 2016: Plumbers/Pipefitters/Steamfitters



Highlights			
Role		**Industry**	
High:	Union (-0.9)	High:	Comm/Inst (-0.5)
Low:	Const Mgr (-5.7)	Low:	Utility (-4.7)
Region		**Organization Size**	
High:	Southwest (0.6)	High:	26-100 (0.6)
Low:	South Central (-3.4)	Low:	5001-10000 (-3.4)

Exhibit 6.33

Union craft labor supply in 2015 for apprentices: Plumbers/Pipefitters/Steamfitters



Highlights			
Role		**Industry**	
High:	Union (0.6)	High:	Comm/Inst (0.8)
Low:	Const Mgr (-5.6)	Low:	Utility (-3.3)
Region		**Organization Size**	
High:	Mid Atl (1.1)	High:	26-100 (2.4)
Low:	West N Central (-2.4)	Low:	5001-10000 (-2.5)

Exhibit 6.34

Union craft labor supply in 2015: Roofers & Waterproofers

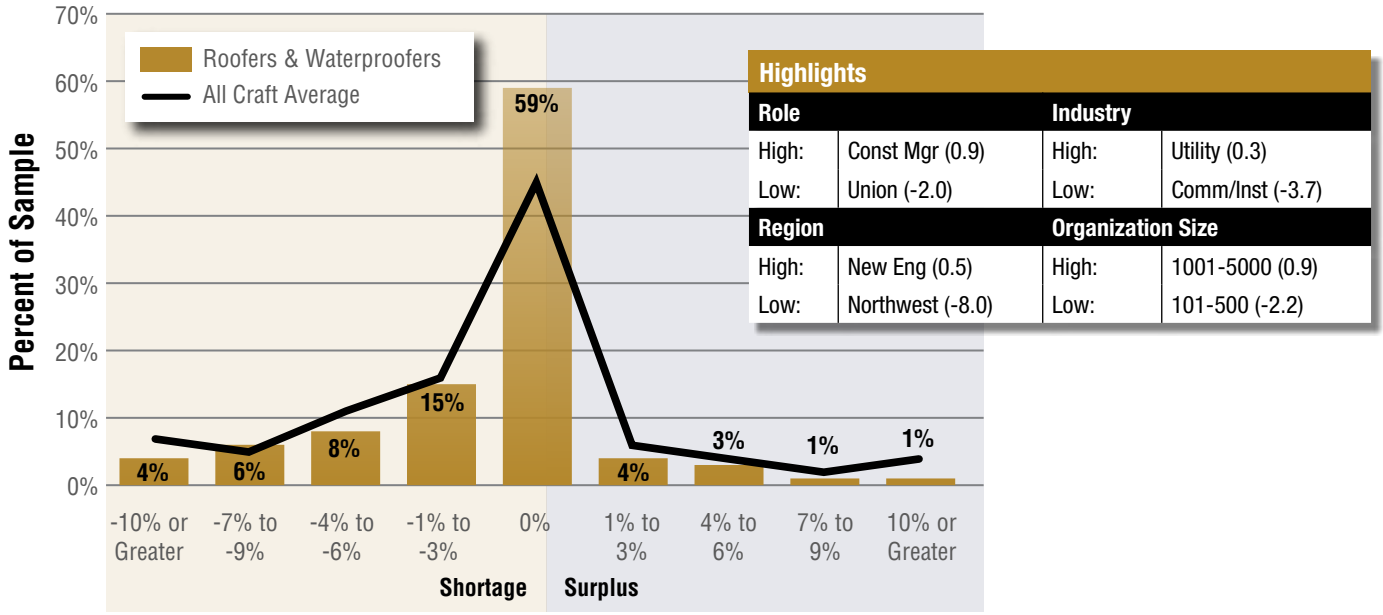


Exhibit 6.35

Union craft labor supply in 2016: Roofers & Waterproofers

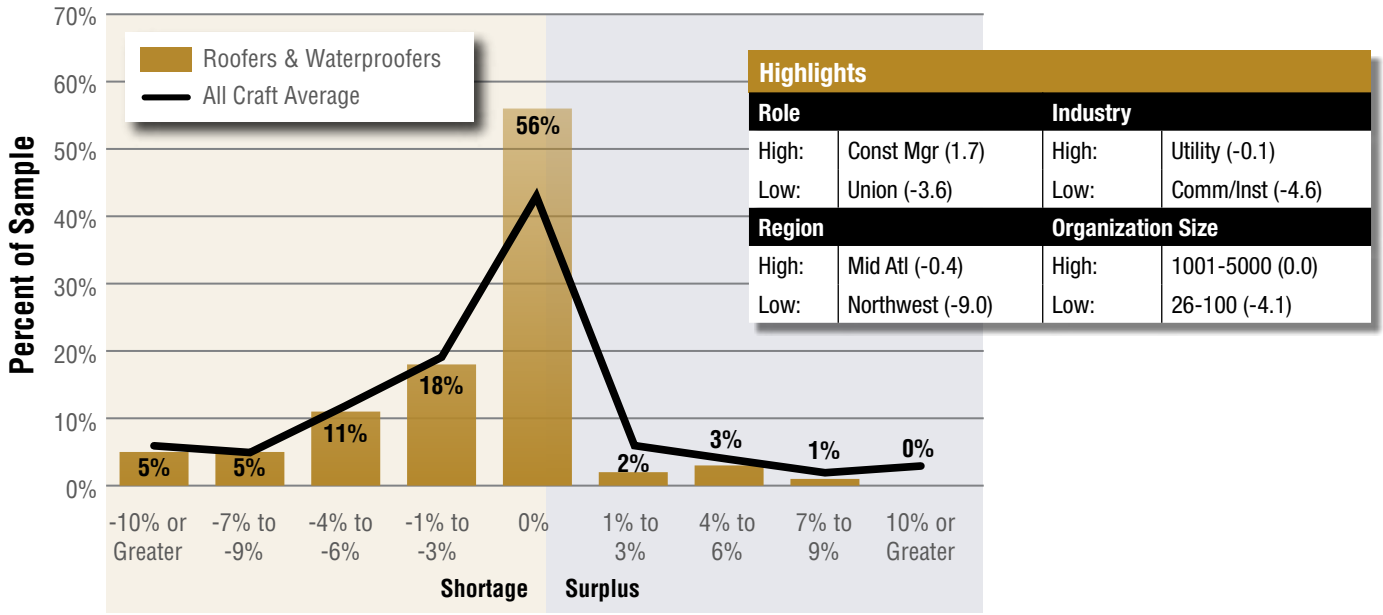


Exhibit 6.36

Union craft labor supply in 2015 for apprentices: Roofers & Waterproofers

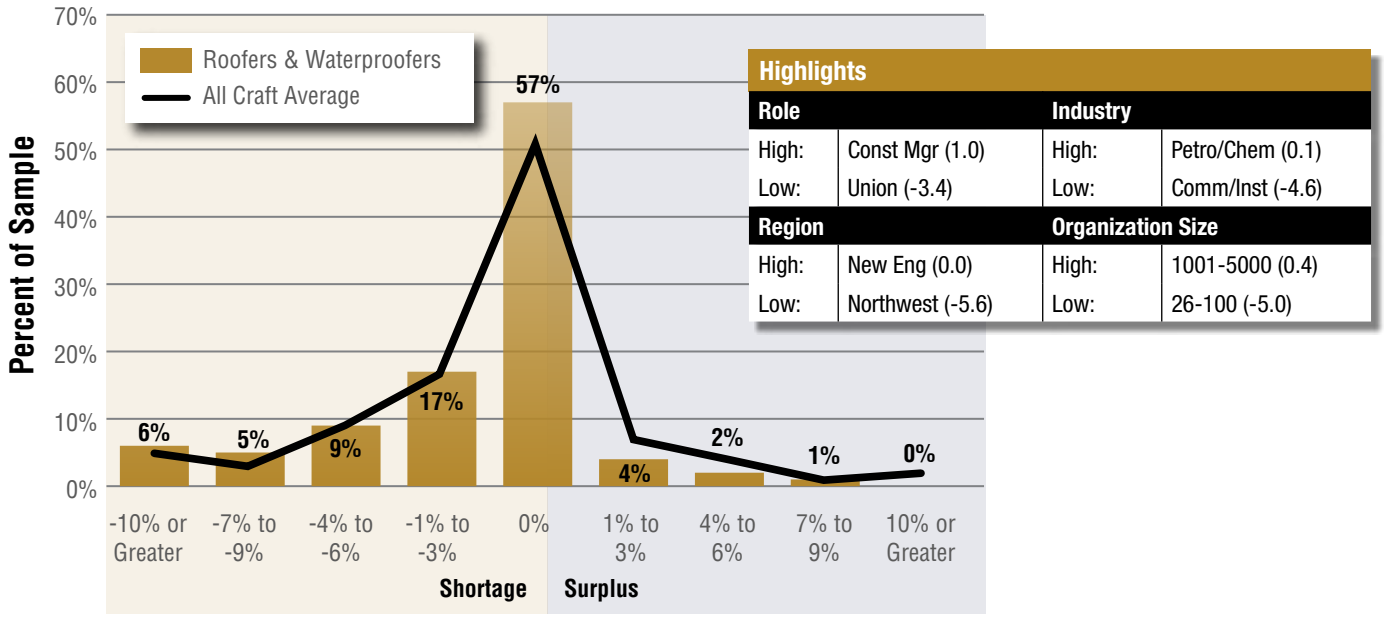
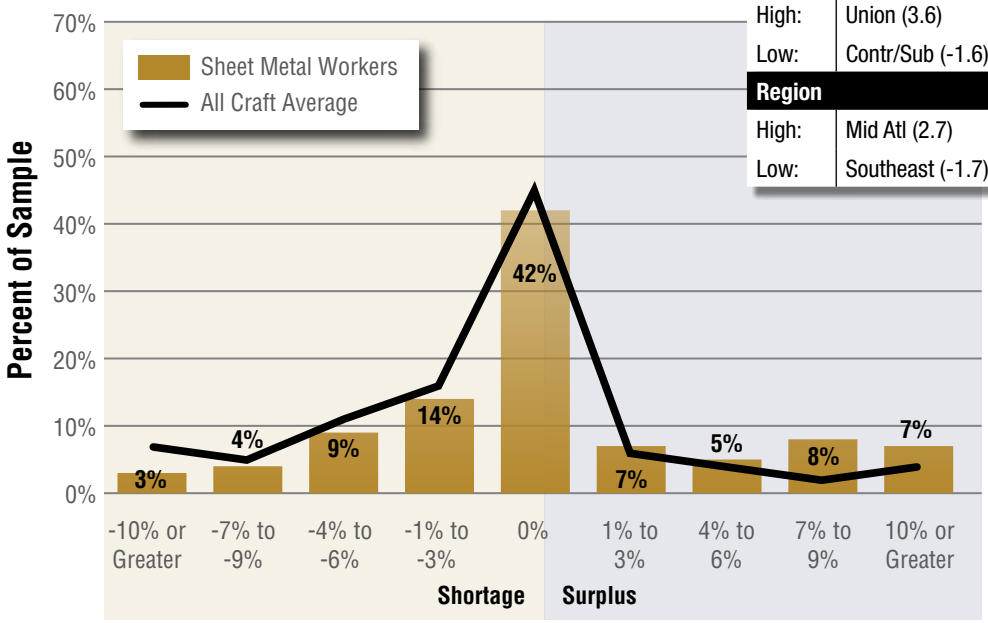


Exhibit 6.37

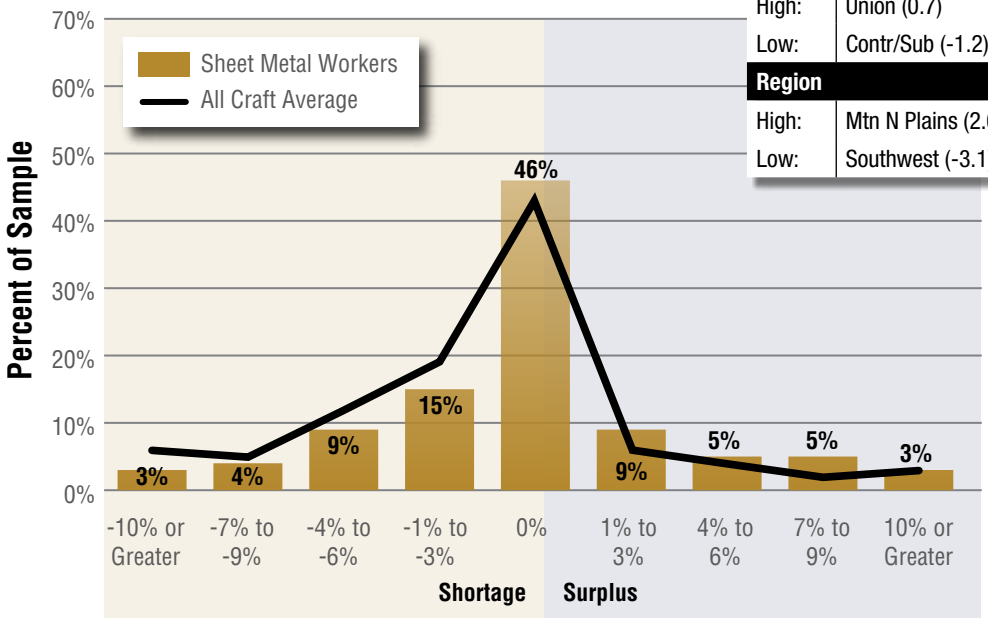
Union craft labor supply in 2015: Sheet Metal Workers



Highlights			
Role		**Industry**	
High:	Union (3.6)	High:	Comm/Inst (2.2)
Low:	Contr/Sub (-1.6)	Low:	Manuf (-2.1)
Region		**Organization Size**	
High:	Mid Atl (2.7)	High:	1001-5000 (2.6)
Low:	Southeast (-1.7)	Low:	26-100 (-1.5)

Exhibit 6.38

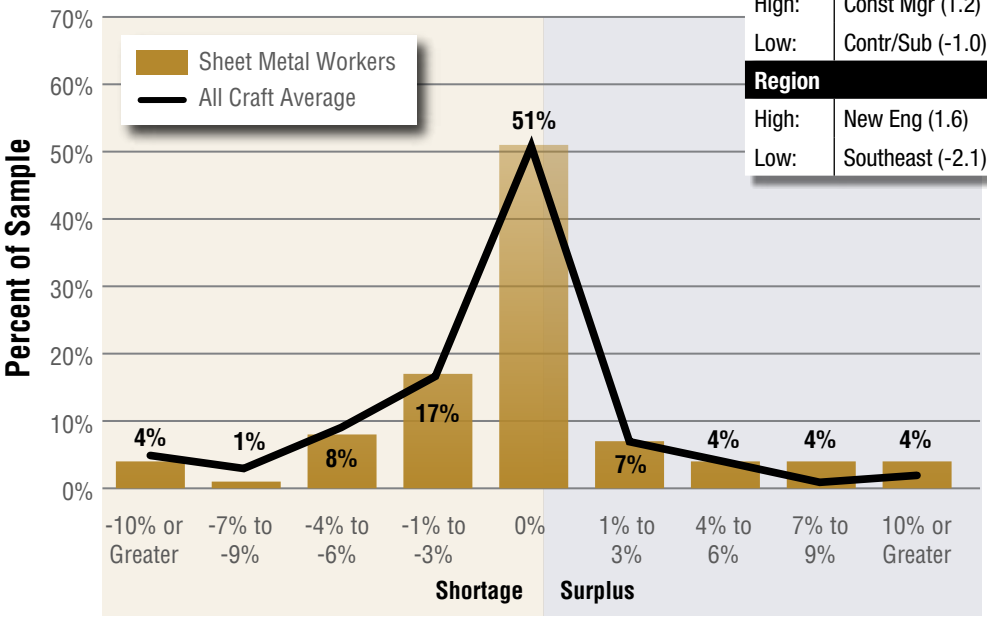
Union craft labor supply in 2016: Sheet Metal Workers



Highlights			
Role		**Industry**	
High:	Union (0.7)	High:	Utility (0.9)
Low:	Contr/Sub (-1.2)	Low:	Manuf (-1.4)
Region		**Organization Size**	
High:	Mtn N Plains (2.6)	High:	1-25 (2.3)
Low:	Southwest (-3.1)	Low:	26-100 (-2.6)

Exhibit 6.39

Union craft labor supply in 2015 for apprentices: Sheet Metal Workers



Highlights			
Role		**Industry**	
High:	Const Mgr (1.2)	High:	Utility (0.6)
Low:	Contr/Sub (-1.0)	Low:	Manuf (-0.9)
Region		**Organization Size**	
High:	New Eng (1.6)	High:	1-25 (2.1)
Low:	Southeast (-2.1)	Low:	26-100 (-2.0)

Exhibit 6.40

Union craft labor supply in 2015: Teamsters

Highlights			
Role		**Industry**	
High:	Const Mgr (3.2)	High:	Comm/Inst (2.3)
Low:	Owner (-0.9)	Low:	Utility (-0.2)
Region		**Organization Size**	
High:	New Eng (1.1)	High:	1001-5000 (2.6)
Low:	South Central (-0.8)	Low:	5001-10000 (-0.2)

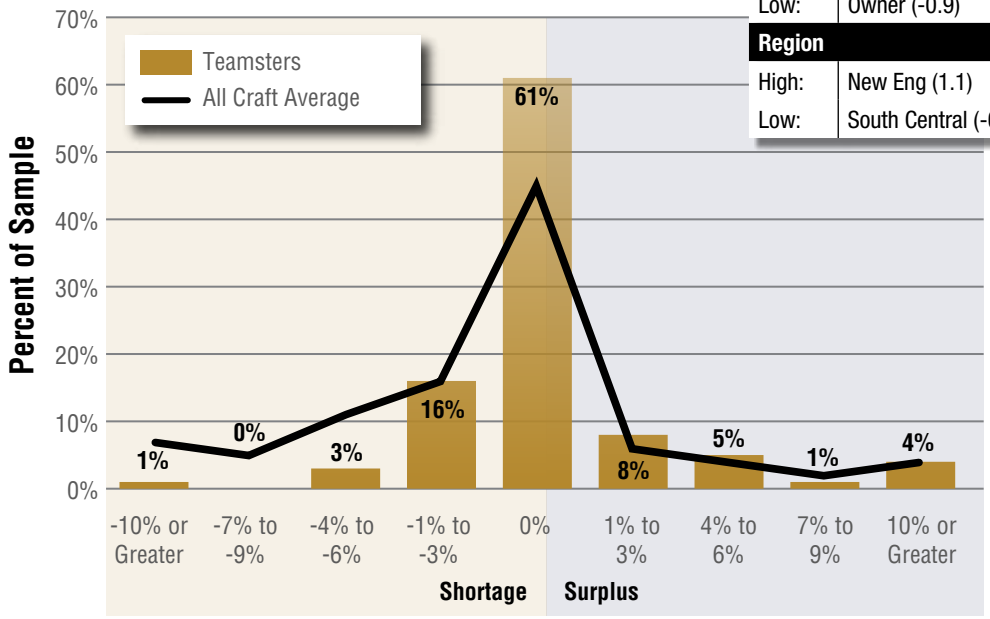


Exhibit 6.41

Union craft labor supply in 2016: Teamsters

Highlights			
Role		**Industry**	
High:	Contr/Sub (0.0)	High:	Civil (4.0)
Low:	Const Mgr (-0.9)	Low:	Petro/Chem (-1.1)
Region		**Organization Size**	
High:	Mid Atl (1.1)	High:	101-500 (1.7)
Low:	New Eng (-2.0)	Low:	1001-5000 (-2.2)

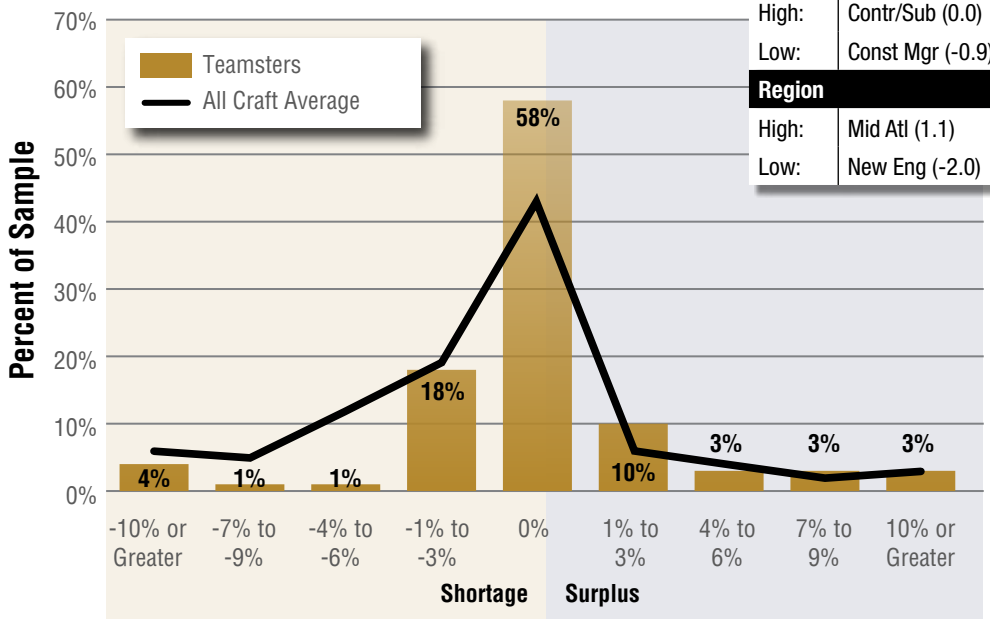
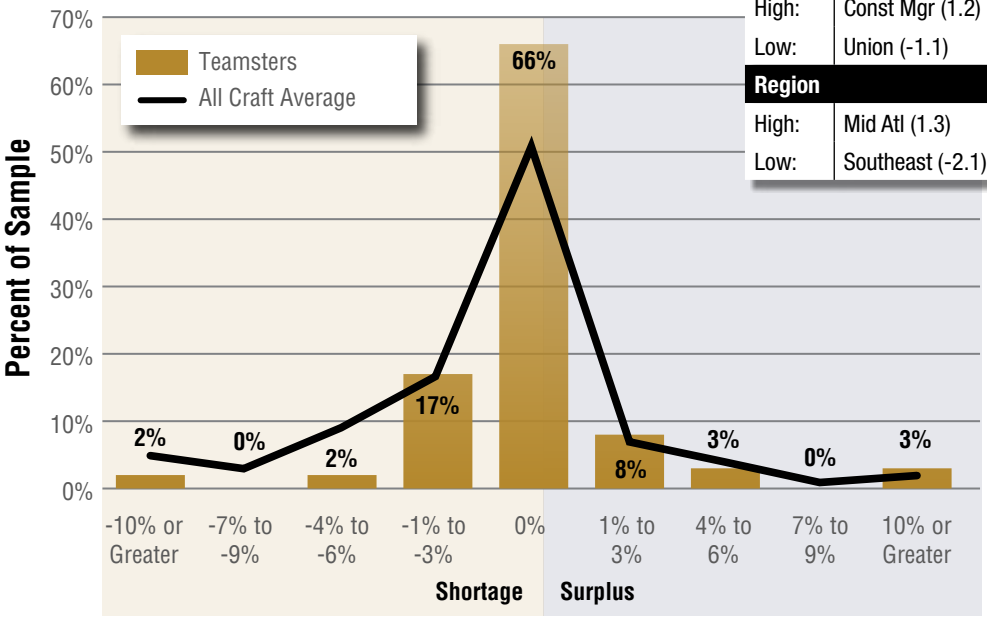


Exhibit 6.42

Union craft labor supply in 2015 for apprentices: Teamsters



Highlights			
Role		**Industry**	
High:	Const Mgr (1.2)	High:	Petro/Chem (0.9)
Low:	Union (-1.1)	Low:	Comm/Inst (-0.5)
Region		**Organization Size**	
High:	Mid Atl (1.3)	High:	1001-5000 (0.7)
Low:	Southeast (-2.1)	Low:	501-1000 (-0.9)

APPENDIX

The tables in the Appendix show the results for union craft worker shortage ratings for interactions between two demographic variables: 1) role x industry and 2) role x region. The values in each cell tell what percent of the sample said there was a shortage.

For example, oval A shows the results for the role x industry interaction—between contractor/subcontractor and the manufacturing industry. This means the value represents the percent of contractors/subcontractors whose organization also does work in the manufacturing industry who said there was a shortage of *(Union Name)* in their organization in 2015 (29%). As another example, this time for the role x region interaction, oval B shows the percent of respondents who are union/labor representatives and who rated the labor supply in the New England region. For this specific subset of people, 33% said there was a shortage of apprentice *(Union Name)*.

(Union Name) 2015 (Example)

Role	Industry					Region								
	Civil	Commercial	Manu-facturing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	100%	-	-	-	100%	-	-	-	-	-
Construction Manager	-	-	-	-	70%	-	33%	100%	-	-	-	-	-	-
Contractor/ Subcontractor	-	0%	**A** 29%	36%	60%	56%	38%	57%	50%	44%	-	-	-	-
Owner	-	-	25%	0%	63%	-	57%	40%	45%	-	-	-	-	-
Union	-	45%	-	67%	36%	50%	33%	43%	0%	67%	-	-	-	-

(Union Name) Apprentices (Example)

Role	Industry					Region								
	Civil	Commercial	Manu-facturing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	100%	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	63%	-	0%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	0%	29%	39%	58%	45%	42%	54%	42%	57%	-	-	-	-
Owner	-	-	50%	0%	25%	-	25%	-	33%	-	-	-	-	-
Union	-	33%	-	33%	32%	**B** 33%	29%	40%	0%	67%	-	-	-	-

Regions:

New England: CT, MA, ME, NH, RI, VT. **Middle Atlantic**: DC, DE, MD, NJ, NY, PA. **Southeast**: AL, FL, GA, KY, MS, NC, SC, TN, VA. **East North Central**: IL, IN, MI, MN, OH, WI, WV. **West North Central**: IA, KS, MO, NE. **South Central**: AR, LA, NM, OK, TX. **Mountain Northern Plains**: CO, MT, ND, SD, UT, WY. **Northwest**: AK, ID, OR, WA. **Southwest Pacific**: AZ, CA, HI, NV.

Boilermakers 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	100%	-	-	-	100%	-	-	-	-	-
Construction Manager	-	-	-	-	70%	-	33%	100%	-	-	-	-	-	-
Contractor/ Subcontractor	-	0%	29%	36%	60%	56%	38%	57%	50%	44%	-	-	-	-
Owner	-	-	25%	0%	63%	-	57%	40%	45%	-	-	-	-	-
Union	-	45%	-	67%	36%	50%	33%	43%	0%	67%	-	-	-	-

Boilermakers 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	100%	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	75%	-	-	67%	-	-	-	-	-	-
Contractor/ Subcontractor	-	0%	29%	45%	70%	69%	36%	62%	60%	60%	33%	-	-	-
Owner	-	-	25%	17%	67%	-	50%	60%	45%	-	-	-	-	-
Union	-	73%	-	75%	38%	60%	50%	83%	0%	67%	-	-	-	-

Boilermakers Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	100%	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	63%	-	0%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	0%	29%	39%	58%	45%	42%	54%	42%	57%	-	-	-	-
Owner	-	-	50%	0%	25%	-	25%	-	33%	-	-	-	-	-
Union	-	33%	-	33%	32%	33%	29%	40%	0%	67%	-	-	-	-

Bricklayers 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	0%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	50%	65%	14%	0%	0%	30%	40%	47%	20%	-	-	-	-
Owner	-	-	11%	0%	7%	-	17%	0%	0%	-	33%	-	-	-
Union	-	64%	-	0%	0%	25%	33%	33%	0%	-	-	-	-	-

Bricklayers 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	-	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	71%	68%	15%	5%	13%	39%	44%	52%	33%	-	-	-	-
Owner	-	-	13%	0%	8%	-	25%	0%	10%	-	-	-	-	-
Union	-	67%	-	33%	0%	33%	20%	40%	0%	-	-	-	-	-

Bricklayers Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	0%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	67%	53%	8%	16%	13%	47%	25%	42%	60%	-	-	-	-
Owner	-	-	0%	0%	14%	-	33%	-	0%	-	-	-	-	-
Union	-	44%	-	-	9%	0%	25%	40%	0%	-	-	-	-	-

Carpenters 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	67%	-	33%	100%	100%	-	-	-	-	-
Contractor/ Subcontractor	-	30%	68%	32%	64%	68%	54%	77%	59%	50%	63%	-	-	60%
Owner	-	-	50%	0%	47%	-	50%	60%	33%	-	33%	-	-	-
Union	20%	55%	67%	33%	17%	67%	38%	38%	0%	-	-	-	33%	-

Carpenters 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	44%	-	33%	33%	-	-	-	-	-	-
Contractor/ Subcontractor	-	33%	67%	36%	66%	78%	58%	71%	56%	44%	75%	0%	-	80%
Owner	-	-	70%	0%	25%	-	50%	50%	36%	-	67%	-	-	-
Union	0%	55%	40%	33%	17%	67%	25%	43%	0%	-	33%	-	-	-

Carpenters Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	56%	-	0%	-	100%	-	-	-	-	-
Contractor/ Subcontractor	-	20%	49%	33%	47%	46%	41%	54%	45%	29%	67%	0%	-	100%
Owner	-	-	50%	0%	14%	-	33%	-	20%	-	-	-	-	-
Union	33%	38%	20%	-	17%	33%	20%	29%	0%	-	-	-	-	-

Electricians 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	71%	-	67%	67%	50%	-	-	-	-	-
Contractor/ Subcontractor	-	30%	61%	41%	45%	43%	43%	56%	41%	38%	60%	50%	-	-
Owner	-	-	64%	20%	31%	-	29%	40%	46%	-	67%	-	-	-
Union	-	38%	-	0%	75%	50%	18%	29%	0%	-	-	100%	-	-

Electricians 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	83%	-	100%	80%	75%	-	-	-	-	-
Contractor/ Subcontractor	-	38%	70%	34%	44%	50%	45%	45%	44%	47%	67%	67%	-	-
Owner	-	-	82%	20%	21%	-	20%	75%	46%	-	67%	-	-	-
Union	-	40%	-	0%	82%	-	20%	33%	0%	-	-	100%	-	-

Electricians Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	54%	-	33%	25%	67%	-	-	-	-	-
Contractor/ Subcontractor	-	43%	61%	37%	37%	43%	55%	55%	34%	31%	50%	50%	-	-
Owner	-	-	75%	0%	13%	-	25%	-	17%	-	-	-	-	-
Union	-	31%	-	0%	82%	-	13%	40%	0%	-	-	67%	-	-

Insulators 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	33%	-	-	33%	-	-	-	-	-	-
Contractor/ Subcontractor	-	56%	33%	26%	39%	20%	35%	50%	32%	46%	67%	67%	-	-
Owner	-	-	13%	0%	14%	-	0%	20%	18%	-	-	-	-	-
Union	-	47%	-	20%	67%	67%	13%	67%	0%	-	67%	-	-	-

Insulators 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	0%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	53%	33%	35%	46%	27%	38%	47%	37%	62%	67%	67%	-	-
Owner	-	-	14%	0%	9%	-	0%	0%	22%	-	-	-	-	-
Union	-	67%	-	20%	64%	-	43%	80%	0%	-	-	-	-	-

Insulators Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	-	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	46%	44%	44%	39%	30%	45%	53%	44%	36%	-	67%	-	-
Owner	-	-	0%	0%	0%	-	0%	-	0%	-	-	-	-	-
Union	-	43%	-	0%	73%	0%	60%	50%	0%	-	-	-	-	-

Iron Workers 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	67%	-	33%	75%	100%	-	-	-	-	-
Contractor/ Subcontractor	-	50%	76%	30%	45%	42%	36%	71%	62%	58%	86%	33%	-	67%
Owner	-	-	30%	0%	13%	-	29%	20%	15%	-	33%	-	-	-
Union	0%	50%	-	25%	33%	40%	15%	57%	0%	-	25%	33%	67%	-

Iron Workers 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	60%	-	67%	67%	100%	-	-	-	-	-
Contractor/ Subcontractor	-	40%	73%	26%	34%	46%	31%	67%	52%	47%	86%	33%	-	67%
Owner	-	-	56%	0%	8%	-	20%	25%	36%	-	33%	-	-	-
Union	0%	56%	-	33%	18%	33%	17%	67%	0%	-	50%	33%	-	-

Iron Workers Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	67%	-	33%	-	100%	-	-	-	-	-
Contractor/ Subcontractor	-	42%	67%	21%	33%	30%	41%	55%	52%	38%	80%	33%	-	67%
Owner	-	-	50%	0%	0%	-	0%	-	14%	-	-	-	-	-
Union	25%	45%	-	-	18%	0%	13%	50%	0%	-	-	33%	-	-

Laborers 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	36%	-	0%	33%	33%	-	-	-	-	-
Contractor/ Subcontractor	-	44%	35%	13%	28%	45%	22%	41%	37%	19%	67%	-	-	-
Owner	-	-	20%	0%	20%	-	29%	20%	8%	-	33%	-	-	-
Union	22%	53%	-	0%	0%	33%	27%	33%	0%	-	-	25%	33%	-

Laborers 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	33%	-	33%	-	33%	-	-	-	-	-
Contractor/ Subcontractor	-	56%	47%	10%	21%	42%	24%	42%	40%	22%	75%	-	-	-
Owner	-	-	20%	0%	8%	-	17%	0%	9%	-	33%	-	-	-
Union	22%	75%	-	0%	0%	-	30%	60%	0%	-	-	33%	33%	-

Laborers Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	25%	-	-	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	69%	41%	16%	24%	50%	36%	36%	39%	27%	-	-	-	-
Owner	-	-	0%	0%	13%	-	25%	-	0%	-	-	-	-	-
Union	14%	60%	-	-	18%	-	29%	33%	0%	-	-	33%	-	-

Operating Engineers 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	10%	-	0%	33%	-	-	-	-	-	-
Contractor/ Subcontractor	-	33%	61%	50%	63%	80%	50%	72%	48%	47%	86%	-	-	-
Owner	-	-	10%	0%	7%	-	14%	0%	0%	-	33%	-	-	-
Union	67%	50%	-	67%	8%	33%	33%	50%	0%	-	-	50%	67%	-

Operating Engineers 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	13%	-	67%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	23%	62%	35%	59%	67%	41%	64%	48%	53%	71%	-	-	-
Owner	-	-	30%	17%	8%	-	20%	20%	18%	-	33%	-	-	-
Union	33%	73%	-	67%	27%	-	43%	67%	0%	-	-	50%	67%	-

Operating Engineers Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	11%	-	33%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	45%	54%	29%	45%	70%	42%	56%	46%	27%	60%	-	-	-
Owner	-	-	0%	17%	0%	-	0%	33%	0%	-	-	-	-	-
Union	33%	50%	-	-	18%	-	33%	33%	0%	-	-	33%	0%	-

Painters & Allied Trades 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	17%	-	33%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	33%	44%	11%	11%	11%	17%	31%	30%	29%	-	-	-	-
Owner	-	-	40%	0%	7%	-	0%	40%	17%	-	33%	-	-	-
Union	-	38%	-	-	0%	40%	17%	17%	0%	33%	-	33%	33%	-

Painters & Allied Trades 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	17%	-	33%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	33%	50%	11%	19%	36%	16%	36%	22%	50%	-	-	-	-
Owner	-	-	40%	0%	0%	-	0%	25%	22%	-	33%	-	-	-
Union	-	45%	-	33%	0%	50%	17%	25%	0%	33%	-	50%	33%	-

Painters & Allied Trades Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	-	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	40%	50%	26%	9%	30%	32%	40%	26%	25%	-	-	-	-
Owner	-	-	0%	0%	0%	-	0%	-	0%	-	-	-	-	-
Union	-	29%	-	-	9%	25%	0%	33%	0%	33%	-	-	33%	-

Plasterers/Cement Masons 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	0%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	43%	65%	8%	4%	0%	25%	36%	46%	33%	-	-	-	-
Owner	-	-	22%	0%	0%	-	0%	20%	0%	-	33%	-	-	-
Union	-	55%	-	0%	0%	0%	20%	40%	0%	-	-	-	-	-

Plasterers/Cement Masons 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	0%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	33%	59%	15%	13%	20%	31%	42%	40%	29%	-	-	-	-
Owner	-	-	0%	0%	0%	-	0%	0%	0%	-	-	-	-	-
Union	-	80%	-	33%	10%	-	20%	67%	0%	-	-	-	-	-

Plasterers/Cement Masons Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	-	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	60%	53%	21%	5%	13%	33%	38%	45%	20%	-	-	-	-
Owner	-	-	0%	0%	0%	-	0%	-	0%	-	-	-	-	-
Union	-	56%	-	-	9%	-	0%	60%	0%	-	-	-	-	-

Plumbers/Pipefitters/Steamfitters 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	83%	-	33%	100%	100%	-	-	-	-	-
Contractor/ Subcontractor	-	39%	61%	53%	63%	57%	45%	77%	52%	65%	60%	-	-	-
Owner	-	-	18%	67%	31%	-	43%	33%	31%	-	33%	-	-	-
Union	-	34%	31%	33%	70%	33%	32%	32%	0%	43%	53%	60%	50%	30%

Plumbers/Pipefitters/Steamfitters 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	100%	-	100%	100%	100%	-	-	-	-	-
Contractor/ Subcontractor	-	48%	67%	45%	66%	71%	54%	72%	53%	62%	60%	-	-	-
Owner	-	-	36%	67%	23%	-	33%	40%	50%	-	33%	-	-	-
Union	-	47%	31%	30%	67%	42%	50%	48%	0%	50%	47%	60%	58%	20%

Plumbers/Pipefitters/Steamfitters Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	89%	-	-	-	100%	-	-	-	-	-
Contractor/ Subcontractor	-	38%	55%	38%	57%	64%	44%	56%	45%	52%	50%	-	-	-
Owner	-	-	0%	50%	25%	-	50%	33%	29%	-	-	-	-	-
Union	-	18%	27%	19%	55%	29%	19%	33%	0%	36%	14%	20%	33%	26%

Roofers & Waterporoofers 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	0%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	50%	53%	0%	0%	0%	31%	27%	33%	20%	67%	-	-	-
Owner	-	-	40%	0%	8%	-	20%	20%	20%	-	33%	-	-	-
Union	-	64%	-	0%	42%	50%	22%	29%	0%	60%	60%	75%	80%	-

Roofers & Waterporoofers 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	-	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	43%	56%	0%	4%	10%	29%	33%	32%	20%	67%	-	-	-
Owner	-	-	30%	0%	9%	-	20%	0%	25%	-	33%	-	-	-
Union	-	87%	-	25%	60%	100%	38%	75%	0%	100%	75%	75%	100%	-

Roofers & Waterporoofers Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	-	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	50%	47%	0%	10%	13%	21%	38%	35%	33%	-	-	-	-
Owner	-	-	0%	0%	13%	-	33%	-	0%	-	-	-	-	-
Union	-	77%	-	0%	55%	25%	50%	60%	0%	100%	100%	75%	80%	-

Sheet Metal Workers 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	0%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	33%	73%	6%	28%	22%	33%	65%	44%	29%	33%	-	-	-
Owner	-	0%	36%	25%	0%	-	0%	33%	15%	-	33%	-	-	-
Union	-	35%	-	33%	0%	14%	7%	33%	0%	40%	43%	67%	25%	25%

Sheet Metal Workers 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	33%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	54%	50%	6%	21%	10%	35%	53%	36%	27%	-	-	-	-
Owner	-	0%	36%	25%	8%	0%	20%	20%	27%	-	33%	-	-	-
Union	-	41%	-	33%	8%	29%	21%	45%	0%	20%	71%	20%	25%	75%

Sheet Metal Workers Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	-	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	45%	48%	19%	32%	22%	35%	50%	40%	43%	-	-	-	-
Owner	-	0%	0%	0%	13%	-	33%	-	0%	-	-	-	-	-
Union	-	31%	-	-	8%	0%	0%	50%	0%	40%	57%	40%	25%	25%

Teamsters 2015

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	0%	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	0%	30%	0%	13%	11%	16%	33%	15%	13%	-	-	-	-
Owner	-	-	25%	0%	15%	-	29%	25%	13%	-	-	-	-	-
Union	40%	58%	-	-	33%	50%	33%	29%	0%	-	-	-	67%	-

Teamsters 2016

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	13%	-	-	0%	-	-	-	-	-	-
Contractor/ Subcontractor	-	0%	33%	14%	8%	18%	19%	30%	21%	13%	-	-	-	-
Owner	-	-	25%	0%	11%	-	17%	33%	14%	-	-	-	-	-
Union	20%	80%	-	33%	18%	-	17%	50%	0%	33%	-	-	67%	-

Teamsters Apprentices

Role	Industry					Region								
	Civil	Commercial	Manufac-turing	Petro/Natural Gas/ Chemical	Utility	NE	MA	SE	ENC	WNC	SC	MNP	NW	SW
Association Executive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Manager	-	-	-	-	0%	-	-	-	-	-	-	-	-	-
Contractor/ Subcontractor	-	50%	19%	0%	9%	22%	8%	33%	19%	14%	-	-	-	-
Owner	-	-	50%	0%	13%	-	25%	-	20%	-	-	-	-	-
Union	0%	56%	-	-	18%	-	0%	50%	0%	-	-	-	-	-