2019

Union Craft Labor Supply Study

Measuring Today for a Successful Tomorrow

TAUC

The Voice for Union
Construction and Maintenance

INTRODUCTION

The **2019 TAUC Union Craft Labor Supply Study** marks the fifth 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 construction and maintenance industry. 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 2019 Union Craft Labor Supply Study was conducted by the Construction Labor Research Council (CLRC) and sponsored by The Association of Union Constructors (TAUC). This is the only national, multi-craft, union-specific study focusing on construction and maintenance. The findings will help create a detailed, data-driven picture of the current state of the union craft labor supply throughout the United States.

TAUC initially launched the study in 2015 (find previous reports **here**) at which time it received a tremendous response from a wide cross-section of the entire industry—contractors, labor representatives, owner-clients and construction association representatives. This year's study has been enhanced based on feedback from last year's respondents.

The *2019 Union Craft Labor Supply Study* drills down into the specifics of both regional and national labor supply trends. New to the study this year is an examination of two key issues: the impact of union craft labor availability on the bidding process, as well as how each of the fourteen unions affect it. 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 the construction and maintenance industry (union and nonunion)
- Labor supply for union craft workers overall and for 14 individual unions, covering:
    - Recent history
    - Projections for 2019
    - Apprentice levels
- Detailed workforce results for each craft
- Difficult to find high demand skills
- The affect of union craft labor availability on the bidding process

KEY FEATURES OF THE STUDY

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=805, (an 8% increase over last year) was drawn from is highly-knowledgeable, experienced and directly engaged in the construction and maintenance industry as well as union craft labor.
- Respondents were instructed to describe their *own experiences*, not their perceptions of others' experiences or what they may have read somewhere, which enhances the validity of the results.
- Thorough and detailed analyses of the data were conducted.
- A large amount of craft-by-craft specific results are included in the report.
- Detailed analyses, including data cuts by the four demographic variables (i.e., role, industry, region, organization size) and interactions among those variables, are presented throughout the report.
- Many charts and tables, along with helpful explanatory text, are included to make interpretation of the findings easy and accurate.

DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

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

- Industry
- Geographic Region
- Organization Size (Number of Employees)
- Organization Role

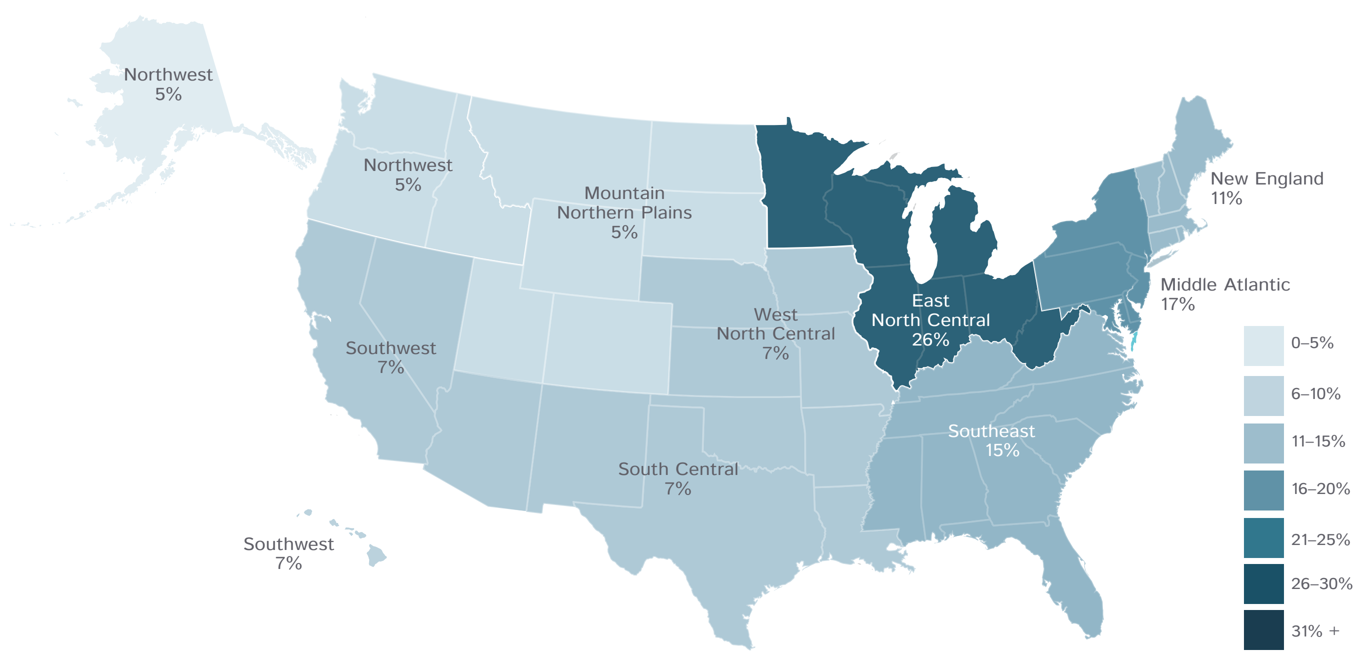
	2018		2019	
Industry	**Number**	**Percent**	**Number**	**Percent**
Civil	37	6%	31	4%
Commercial/Institutional	252	37%	310	43%
Manufacturing	140	21%	153	21%
Petroleum/Natural Gas/Chemical	73	11%	90	12%
Utility	123	18%	100	14%
Other	47	7%	42	6%
Total	672	100%	726	100%

*Total sums to fewer respondents than the sample size because some did not indicate industry.

	2018		2019	
Geographic Region	**Number**	**Percent**	**Number**	**Percent**
New England	127	11%	135	11%
Middle Atlantic	227	20%	206	17%
Southeast	165	14%	180	15%
East North Central	342	29%	316	26%
West North Central	94	8%	86	7%
South Central	71	6%	81	7%
Mountain Northern Plains	49	4%	56	5%
Northwest	29	3%	56	5%
Southwest	62	5%	83	7%
Total	1,166	100%	1,199	100%

*Total sums to more than the sample size because respondents could provide data for more than one region.

Geographic Region—2019



	2018		2019	
Number of Employees	**Number**	**Percent**	**Number**	**Percent**
1-25	55	7%	97	12%
26-100	82	11%	117	15%
101-500	214	29%	217	27%
501-1,000	129	17%	98	12%
1,001-5,000	117	16%	126	16%
5,001-10,000	28	4%	36	4%
More than 10,000	123	16%	114	14%
Total	748	100%	805	100%

	2018		2019	
Organization Role	**Number**	**Percent**	**Number**	**Percent**
Association Employee	20	3%	30	4%
Construction Manager	44	6%	38	5%
Contractor/Subcontractor	275	37%	344	42%
Owner/Client	40	5%	49	6%
Union/Labor Representative	343	46%	319	40%
Other	26	3%	25	3%
Total	748	100%	805	100%

KEY FINDINGS

1. Continued Strong and Stable Growth Projections

About three fourths (76%) of the study participants projected growth for 2019 in the construction and maintenance industry. This is similar to last year (78%). Those projecting "strong growth" continued to increase in number, up to 25% this year. In 2015 just 9% expected strong growth.

- Role: Union/Labor representatives have the highest, and Owner/Clients the lowest, ratings regarding projected growth.
- Industry: The Civil Industry has the strongest growth prospects and Utility the weakest. Region: The New England, Middle Atlantic and Southeast regions have the strongest growth projections and the South Central region the weakest.
- Organization Size: Growth ratings from those in organizations with no more than 1,000 employees were higher than those from larger organizations.

2. A Growing Shortage of Union Craft Labor

More respondents reported that the union craft labor shortage in their organization in 2018 was greater than in previous years. However, although a union craft labor shortage is very prevalent, reported in 69% of the organizations, the majority (54%) said it was small, defined as a 12.5% shortage of workers by study participants. About a third (31%) reported a surplus or the right number of union craft in their organization.

- Role: Fewer Union/Labor representatives reported a labor shortage than those in management roles i.e. Contractor/Subcontractor, Construction Manager and Owner/Clients.
- Industry: While the Utility industry had the weakest growth prospects, it had the greatest concerns about a labor shortage. Conversely, some of the stronger growth projections were combined with the fewest concerns about a worker shortage in the Commercial/Institutional industry.
- Region: The New England, Southeast, Mountain Northern Plains and Northwest regions had the most people reporting a union craft labor shortage and the South Central and Southwest the fewest. The Southeast region presents the challenging scenario of strong growth combined with a higher than average union craft labor shortage.
- Organization Size: Organizations with at least 501 employees generally had more concerns about shortages than those with 500 or fewer employees.

3. Differing Perspectives: Management vs Labor and Large vs Small

Union/Labor representatives had more optimistic perspectives than management (Contractor/Subcontractor, Construction Manager and Owner/Clients). That is, they had higher ratings about growth prospects for 2019 and fewer members reporting a union craft worker shortage in 2018. This pattern is consistent with findings from previous years of this study.

Respondents from smaller organizations (less than 1,001 employees) had somewhat more favorable responses than those from larger organizations (more than 1,000 employees). Those in smaller organizations predicted stronger growth in 2019 and fewer union craft labor shortages in 2018 than their counterparts in the larger organizations.

4. Craft Specific Shortages

Craft specific data were analyzed for three key factors: 2018 actual, 2019 projected and 2018 apprentices.

- 2018 Actual: Boilermakers, Carpenters & Millwrights, Heat & Frost Insulators and Iron Workers were the crafts with the most substantial shortages in 2018.
- 2019 Projected: The same crafts as 2018 actual above with the addition of the Painters & Allied Trades were projected to have the greatest shortages in 2019.
- 2018 Apprentices: Heat & Frost Insulators, Iron Workers and Painters & Allied Trades were the crafts with the most significant apprentice shortages in 2018.

5. The Impact of the Availability of Union Labor and Union Contractors

Results show that 44% of the Contractors/Subcontract and Construction Managers did not bid on some work due to a shortage of union craft workers in their organization. The crafts impacting this the most were Electricians, followed by Plumbers, Pipefitters & Steamfitters, Iron Workers and Carpenters & Millwrights.

Finding also show that 92% of Union/Labor representatives strongly believe that there is an immediate need for additional union contractors.

STUDY RESULTS

On January 14, 2019, a questionnaire focusing on the union craft labor supply in the construction and maintenance industry was circulated to individuals directly engaged in that industry. A total of 805 people responded (an 8% increase over last year), representing a variety of roles in their organizations, industries, geographic regions and organization sizes.

I. STUDY DEMOGRAPHICS

A. Role

As shown in **Exhibits 1.1 and 1.2**, in 2019 most respondents were either a Union/Labor representative (40%) or a Contractor/Subcontractor (42%). The remaining roles represented 18% of the study sample.

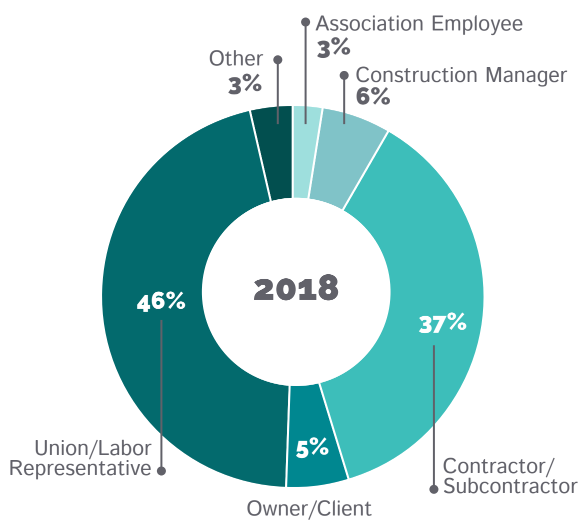
Exhibit 1.1

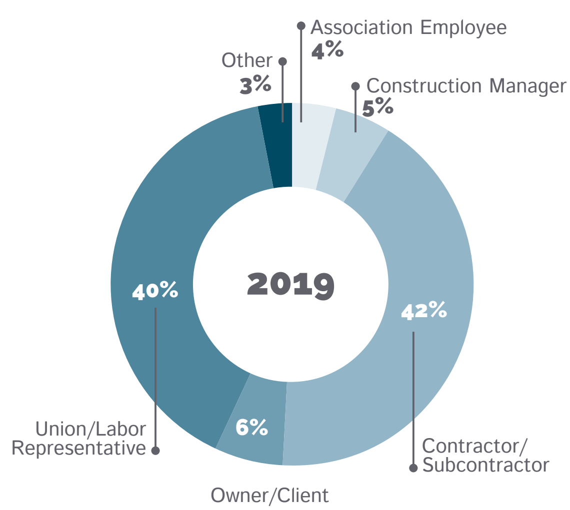
RESPONDENT ROLE TABLE

	2018		2019	
Organization Role	**Number**	**Percent**	**Number**	**Percent**
Association Employee	20	3%	30	4%
Construction Manager	44	6%	38	5%
Contractor/Subcontractor	275	37%	344	42%
Owner/Client	40	5%	49	6%
Union/Labor Representative	343	46%	319	40%
Other	26	3%	25	3%
Total	748	100%	805	100%

Exhibit 1.2

RESPONDENT ROLE CHARTS





B. Industry

Study participants were asked to indicate the industry in which their organization performed the most union construction and maintenance work. The Commercial/Institutional industry sector was again the most common one in 2019, representing 43% of the sample (38% in 2018), as displayed in **Exhibits 1.3 and 1.4**. Manufacturing, Petroleum/Natural Gas/Chemical and Utility were represented by 11% to 21% of the respondents in both 2018 and 2019. The final industry sector, Civil, represented 4% of the data in 2019.

Exhibit 1.3

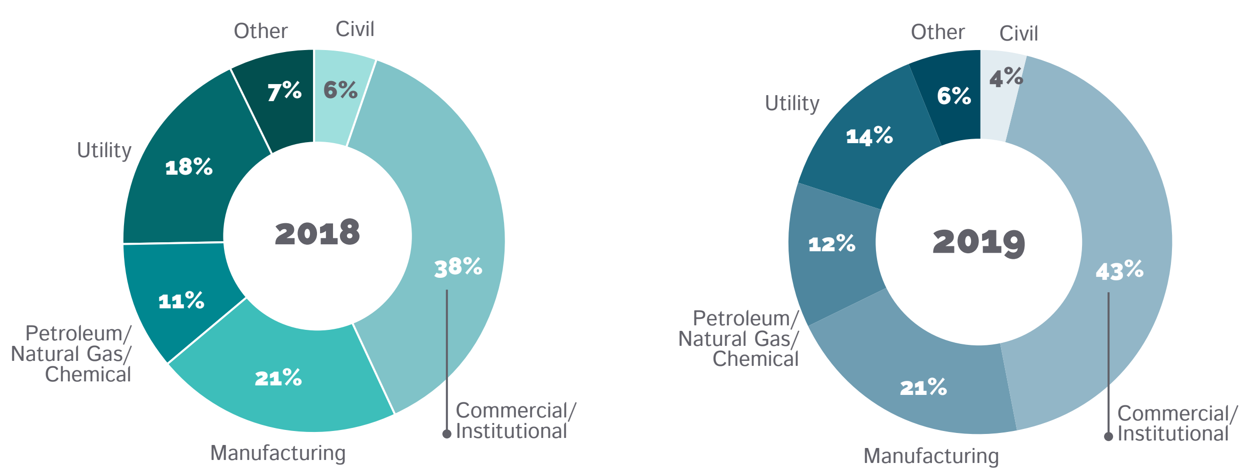
INDUSTRY TABLE

	2018		2019	
Industry	**Number**	**Percent**	**Number**	**Percent**
Civil	37	6%	31	4%
Commercial/Institutional	252	37%	310	43%
Manufacturing	140	21%	153	21%
Petroleum/Natural Gas/Chemical	73	11%	90	12%
Utility	123	18%	100	14%
Other	47	7%	42	6%
Total	672	100%	726	100%

*Total sums to fewer respondents than the sample size because some did not indicate industry.

Exhibit 1.4

INDUSTRY CHARTS



C. Region

Respondents were instructed to indicate the region(s) for which they were most familiar with their organization's union construction and maintenance work activity. In order to ensure reliable data from knowledgeable participants, respondents were instructed to provide data only for those regions they were familiar with and where their organization had performed work.

The East North Central region had the plurality of responses both in 2018 and 2019 at 29% and 26%, respectively, as illustrated in **Exhibits 1.5 and 1.6.** Other regions with a double digit percent of the responses in 2019 are the Middle Atlantic (17%), Southeast (15%) and New England (11%).

Exhibit 1.5

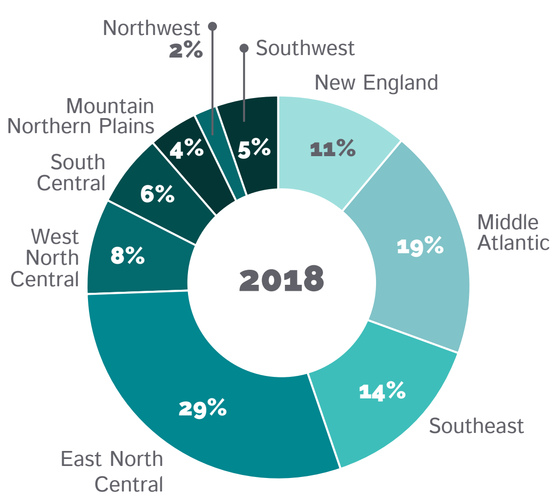
REGION TABLE

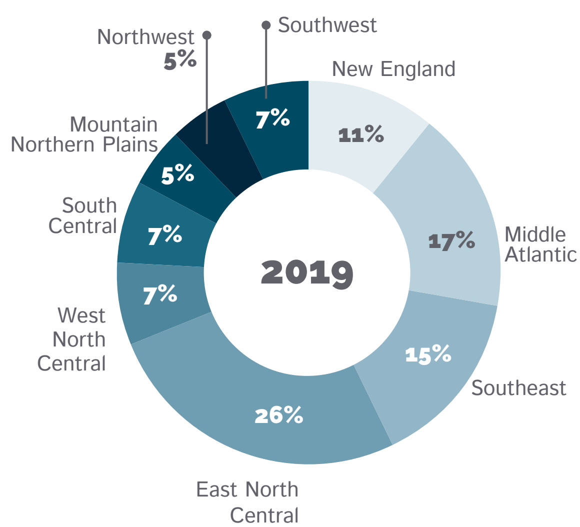
	2018		2019	
Geographic Region	**Number**	**Percent**	**Number**	**Percent**
New England	127	11%	135	11%
Middle Atlantic	227	20%	206	17%
Southeast	165	14%	180	15%
East North Central	342	29%	316	26%
West North Central	94	8%	86	7%
South Central	71	6%	81	7%
Mountain Northern Plains	49	4%	56	5%
Northwest	29	3%	56	5%
Southwest	62	5%	83	7%
Total	1,166	100%	1,199	100%

*Total sums to more than the sample size because respondents could provide data for more than one region.

Exhibit 1.6

REGION CHARTS





D. Organization Size

Exhibits 1.7 and 1.8 show that the participants in the study were fairly evenly distributed across various sizes of organizations. The most common size was 101-500 employees (27%) and the smallest percent of respondents (4%) represented organizations with 5,001-10,000 employees. All other organization sizes accounted for 12% to 16% of the sample.

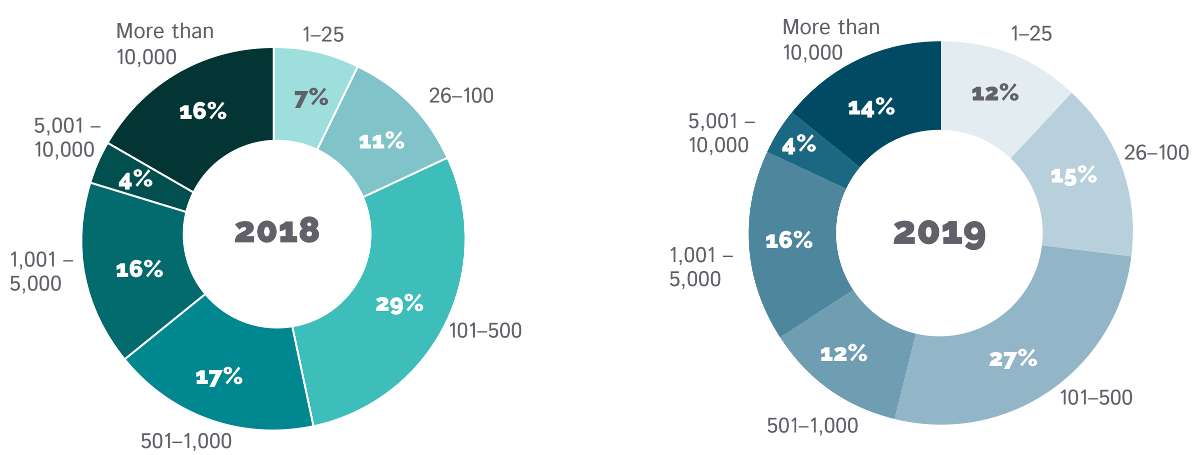
Exhibit 1.7

ORGANIZATION SIZE TABLE

	2018		2019	
Number of Employees	**Number**	**Percent**	**Number**	**Percent**
1-25	55	7%	97	12%
26-100	82	11%	117	15%
101-500	214	29%	217	27%
501-1,000	129	17%	98	12%
1,001-5,000	117	16%	126	16%
5,001-10,000	28	4%	36	4%
More than 10,000	123	16%	114	14%
Total	748	100%	805	100%

Exhibit 1.8

ORGANIZATION SIZE CHARTS



II. GROWTH AND CONTRACTION IN THE CONSTRUCTION AND MAINTENANCE INDUSTRY

Section II refers to *all* construction and maintenance work, including both union and nonunion (the remainder of the report after **Section II** focuses specifically on *union only*). This section documents the degree of growth or contraction projected by the study sample for 2019 (and for 2017 and 2018 as points of comparison) and how long they believe the growth or contraction will last.

Section II is divided into two parts:

- Part 1. Overall Growth/Contraction
- Part 2. Growth/Contraction by Demographic Data Cut
    - Role
    - Industry
    - Industry by Region
    - Region
    - Organization Size

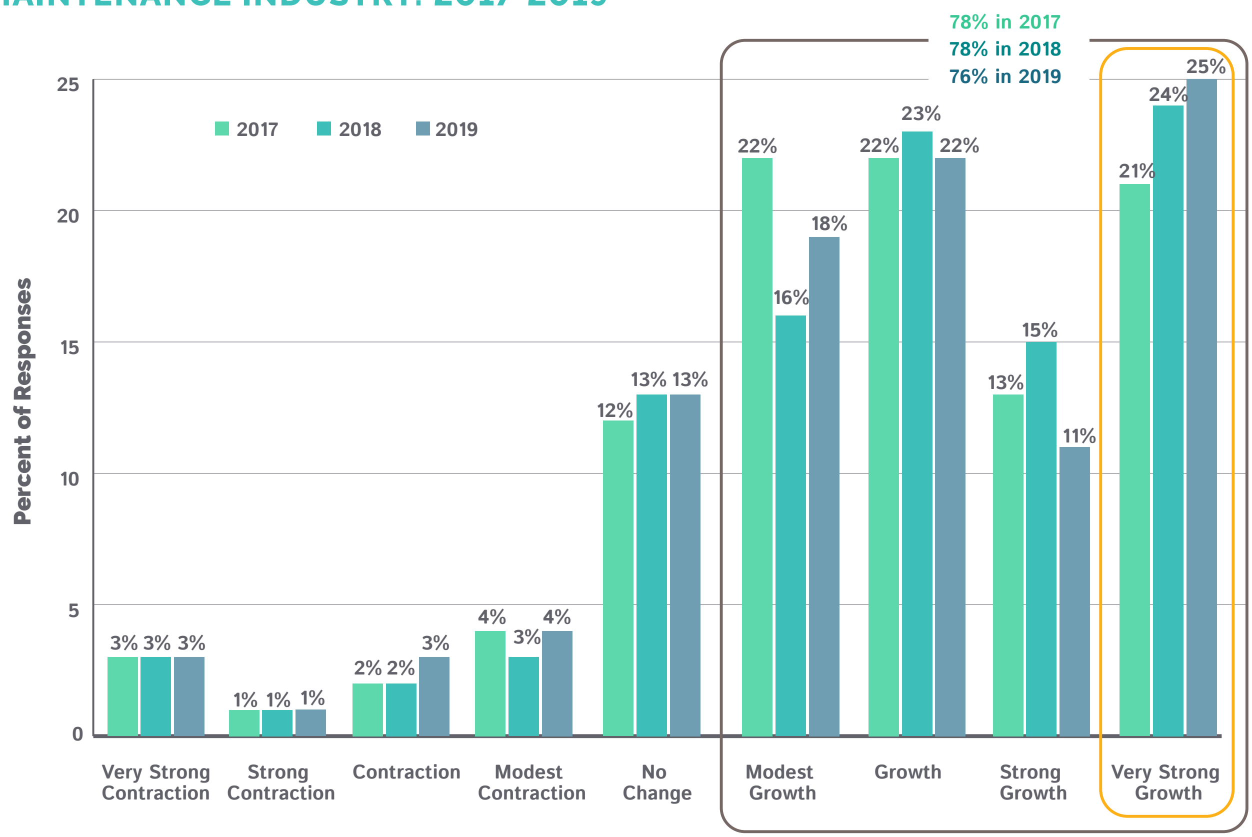
Part 1. Overall Growth/Contraction

Exhibit 2.1 illustrates how the study samples for 2017–2019 fell into each of the rating options for growth (i.e., modest growth, growth, strong growth, and very strong growth), contraction (i.e., modest contraction, contraction, strong contraction, very strong contraction) and no change.

Since 2017, over 75% of the respondents have projected growth for the ensuing year. More specifically, in both 2017 and 2018, 78% reported that they anticipated growth in their organization. In 2019 slightly fewer, 76%, projected growth. At the most pronounced end of the rating scale, the right side in **Exhibit 2.1,** the percent of the sample projecting "very strong growth" has increased steadily since 2015, when it was 9% (see earlier reports), to 25% in 2019. Conversely, very few believe there will be contraction in the construction and maintenance industry.

Exhibit 2.1

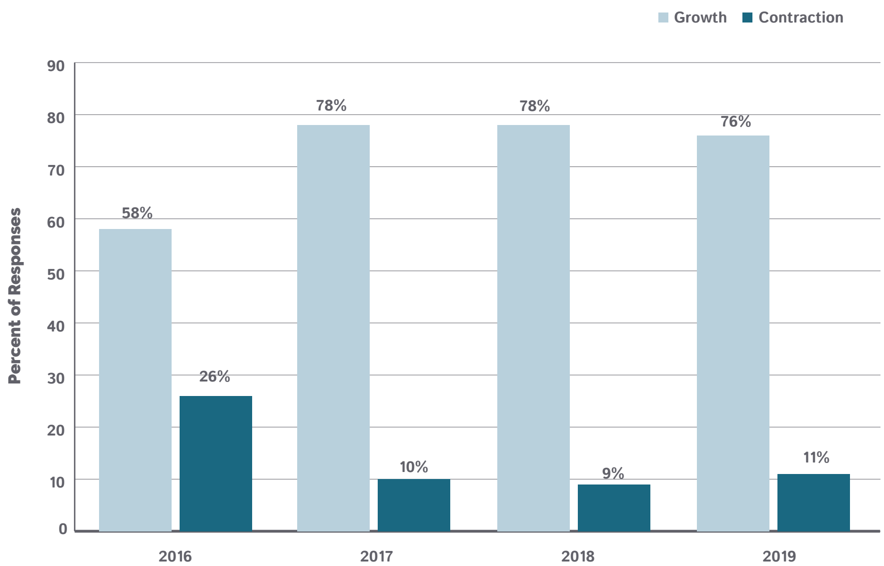
GROWTH/CONTRACTION PROJECTIONS FOR THE CONSTRUCTION AND MAINTENANCE INDUSTRY: 2017-2019



The chart in **Exhibit 2.2** illustrates how growth and contraction ratings have trended from 2016–2019. There was a significant change from 2016 to 2017. Since then the data are consistent.

Exhibit 2.2

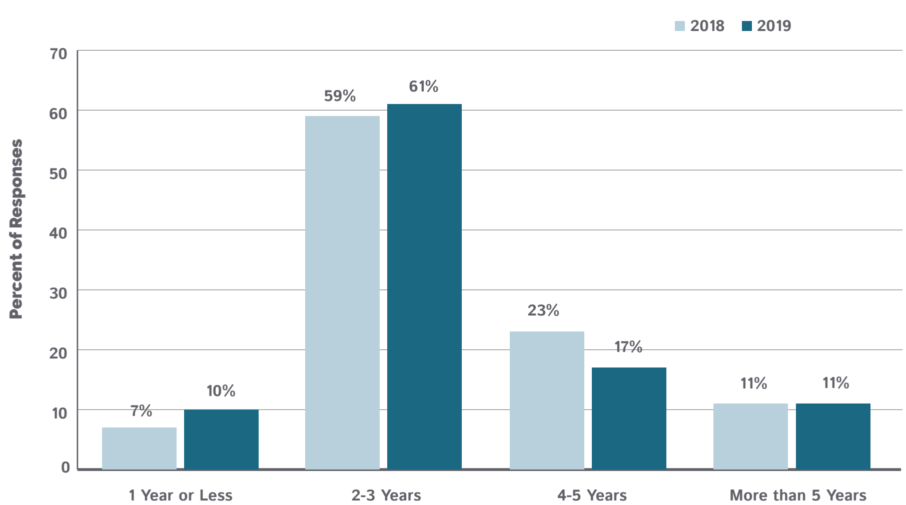
GROWTH AND CONTRACTION TREND



A majority (61%) of people expecting growth in construction and maintenance opportunities said it would last 2-3 years, as shown in **Exhibit 2.3**. Most of the remainder thought it would last longer, 4-5 years or even more than five years. In this year's survey, a few (10%) believed that the growth would last for a year or less. These results are mostly similar to last year's results.

Exhibit 2.3

TIMESPAN FOR GROWTH PROJECTIONS



Part 2. Growth/Contraction by Demographic Data Cut

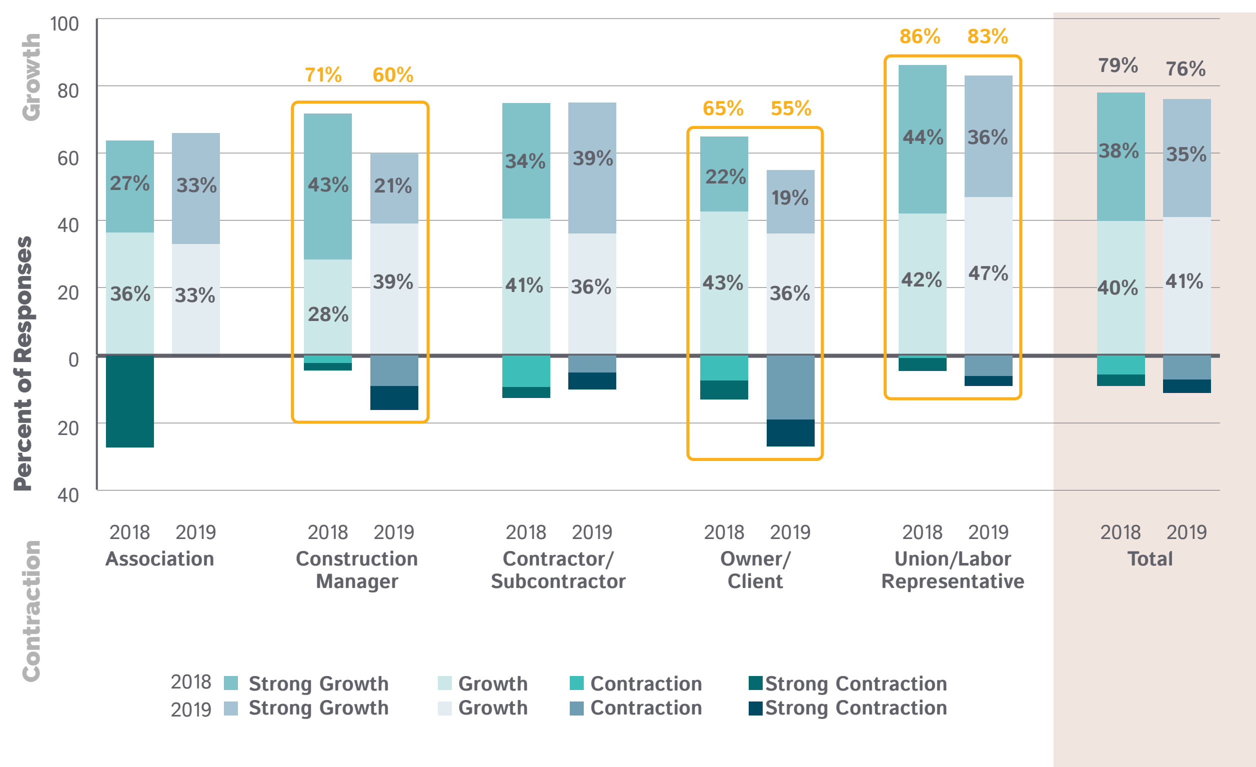
Exhibits 2.4 – 2.11 show results for growth/contraction by four data cuts: role, industry, region and organization size. *The bars in the bar charts represent the percent of the sample providing each rating (i.e., growth, strong growth, contraction, strong contraction) not the actual percent of growth or contraction projected for the construction and maintenance industry.*

In **Exhibit 2.4,** the results regarding growth/contraction projections for 2019 are shown by respondent role. For comparison, also included are growth projections for 2018 from last year's study. *One prominent characteristic of the results is that there were fewer growth ratings this year than last year from respondents in three of the roles: Construction manager, Owner/Client and Union/Labor representative.* Additionally, the percent of each of these roles indicating "strong growth" (dark blue segment) was less in 2019 than 2018. Conversely, a greater percent of each of these roles predicted "strong contraction" for 2019.

An interesting second finding is that the most optimistic role in 2018 and 2019 was Union/Labor representative. They were seven percent over the next highest role (Contractor/Subcontractor) and 27% ahead of the lowest role (Owner/Client) in 2019. Overall, 76% projected growth in 2019.

Exhibit 2.4

PERCENT PROJECTING GROWTH/CONTRACTION FOR 2018 & 2019: BY ROLE

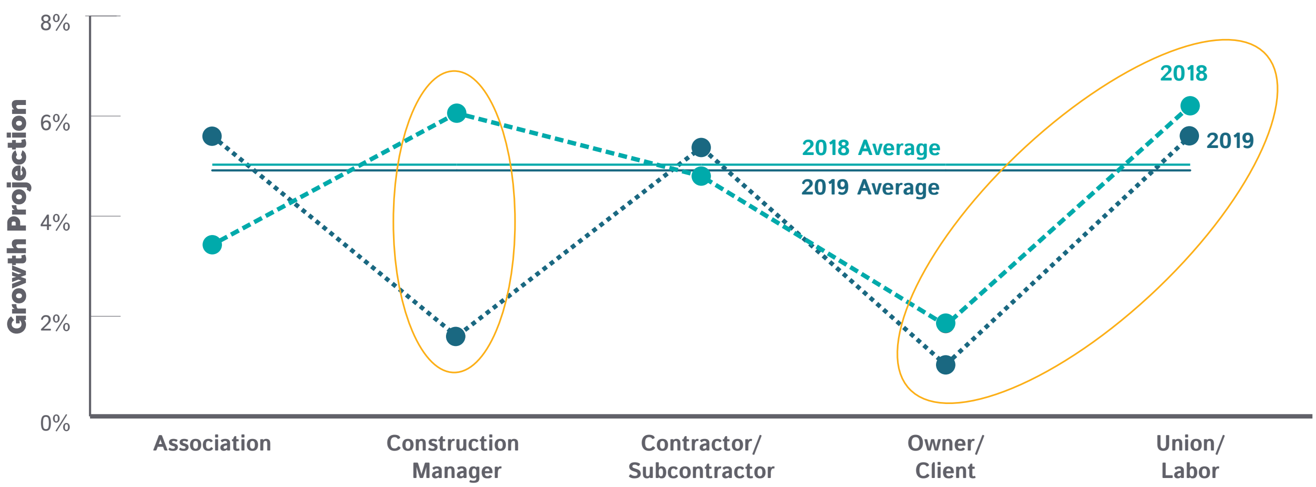


In **Exhibit 2.5**, the *average* growth/contraction projections by role are shown. Whereas, **Exhibit 2.4** shows the percent of responses for various response options (i.e., growth, strong growth, contraction, strong contraction) and does not show those who said there would be no growth, this analysis uses all ratings and averages the degree of growth expected.

The consistency between 2018 and 2019 is readily apparent for all roles except Construction Manager, where the 2019 average was much lower than 2018. Consistent with **Exhibit 2.4**, the Owner/Client and Union/Labor representative roles had the lowest and highest averages, respectively.

Exhibit 2.5

AVERAGE GROWTH/CONTRACTION PROJECTIONS FOR 2018 & 2019: BY ROLE



It is useful to note that the values shown for **Exhibits 2.5, 2.7, 2.9 and 2.11** are the average of all ratings—those reporting growth, those reporting contraction and those reporting no change. Although the line graphs are valuable because they concisely and accurately summarize all ratings, the contraction ratings (negative values in the analysis) and growth ratings (positive values) tend to cancel each other out somewhat when calculating the average.

As a result, the averages contained in the line graphs are somewhat “muted.” In other words, if the average were calculated separately for those reporting growth and those reporting contraction the results would be more pronounced.

Exhibit 2.6 shows that the greatest optimism for growth was with the Civil industry in 2019. The lowest expectations for growth were with the Utility industry in both 2018 and 2019.

Projected growth was greater and projected contraction was less in 2019 than in 2018 for two industries, Civil and Petroleum/Natural Gas/Chemical.

Exhibit 2.6

PERCENT PROJECTING GROWTH/CONTRACTION FOR 2018 & 2019: BY INDUSTRY

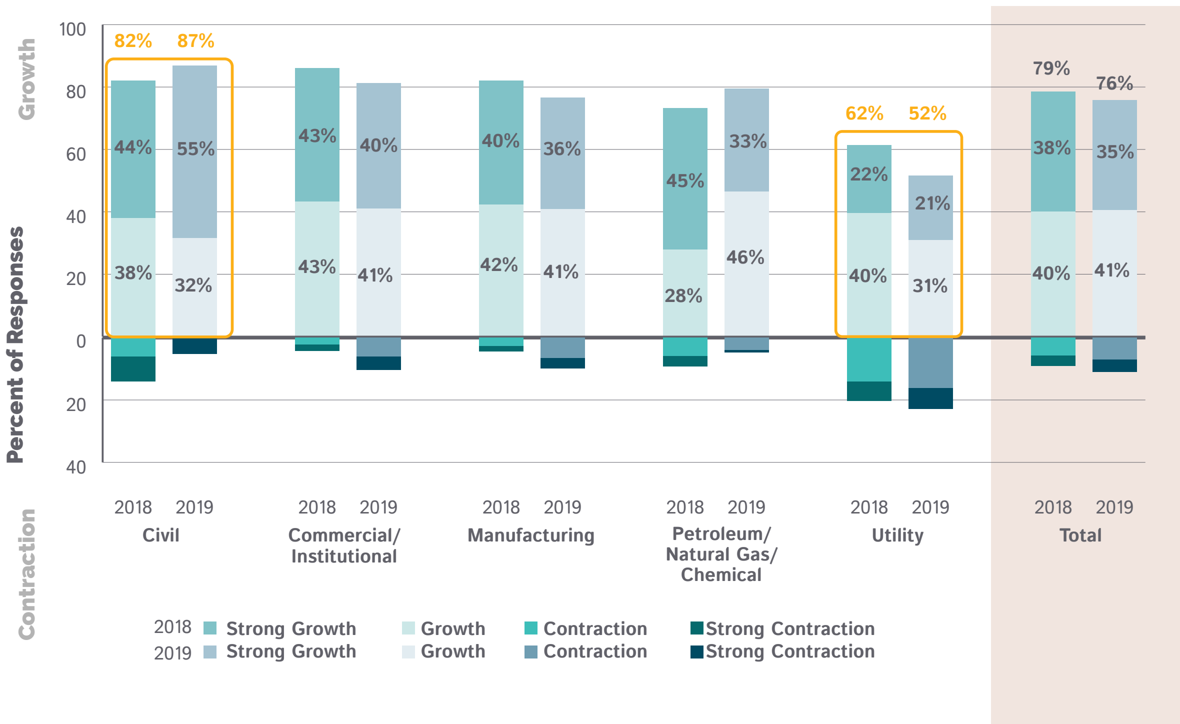
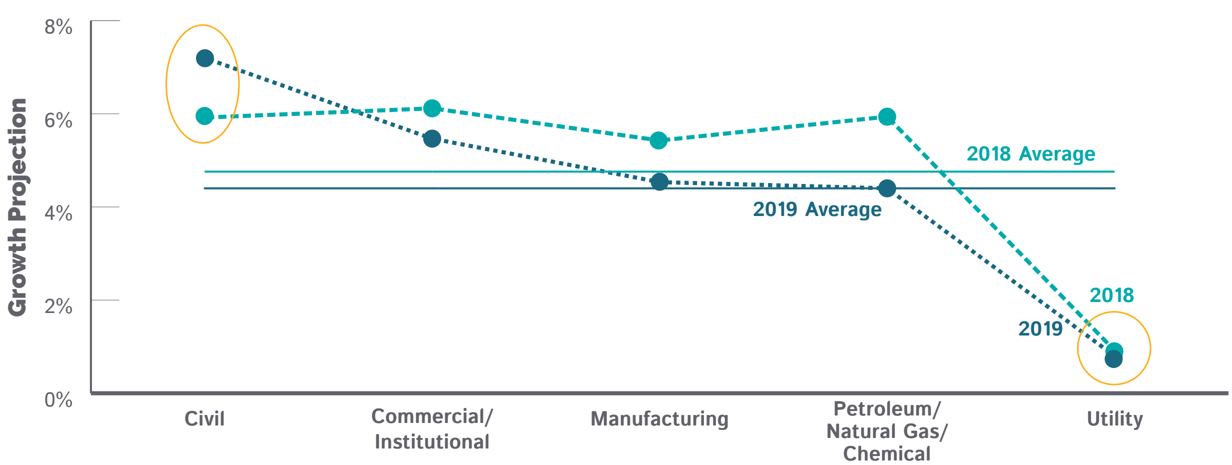


Exhibit 2.7 clearly illustrates the high degree of consistency between 2018 and 2019. The average was reversed for one industry, Civil, where 2019 was higher than 2018. For all other industries, 2018 was higher than 2019.

As expected based on **Exhibit 2.6**, the Utility industry reflected the lowest average ratings for growth and Civil had the highest ratings in 2019.

Exhibit 2.7

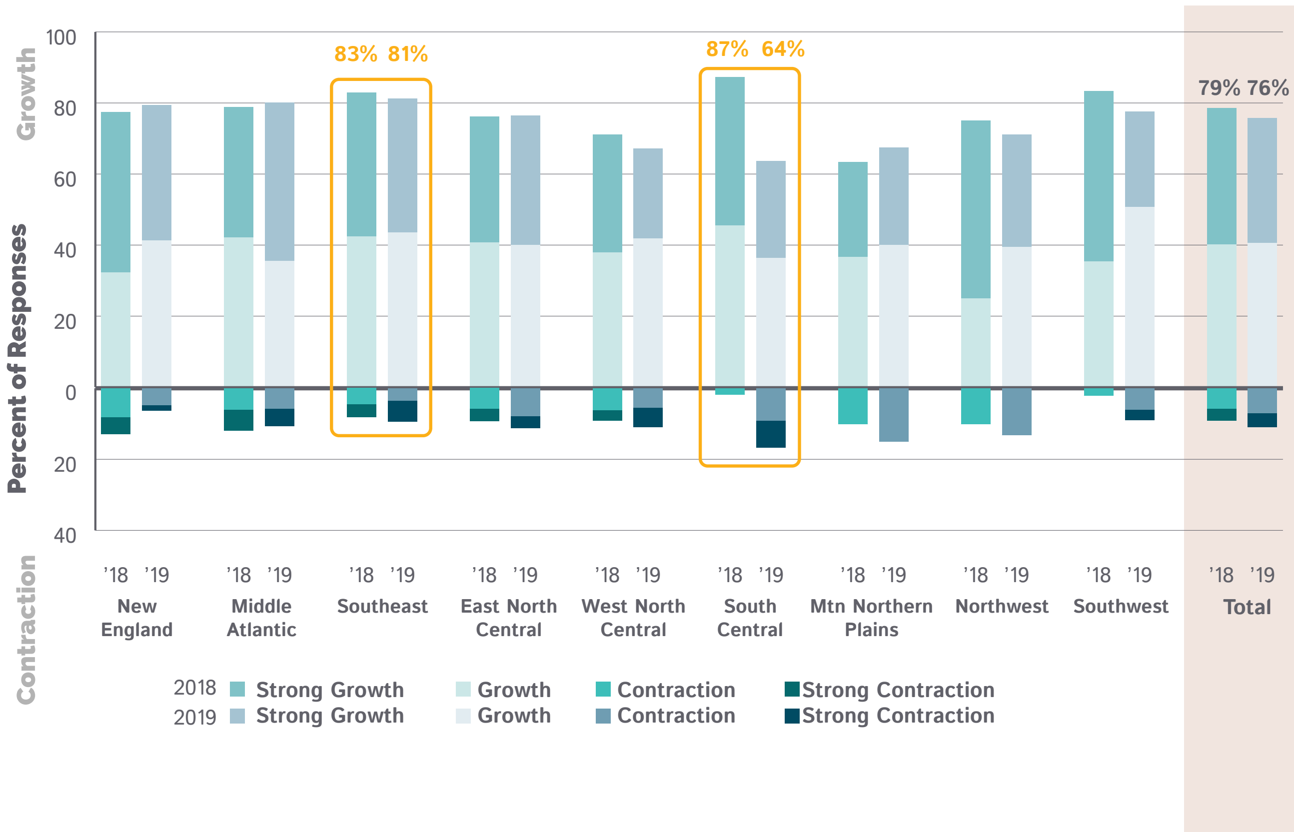
AVERAGE GROWTH/CONTRACTION PROJECTIONS FOR 2018 & 2019: BY INDUSTRY



Differences in growth/contraction projections among the nine geographic regions are displayed in **Exhibit 2.8**. Data for the South Central region had a significant drop from 2018 to 2019, going from 87 percent to 64 percent. It also had the smallest percent of respondents projecting growth in 2019, followed closely by the West North Central and Mountain Northern Plains regions. The greatest percent of respondents marking growth for 2019 were in the eastern part of the United States, the New England, Middle Atlantic and Southeast regions.

Exhibit 2.8

PERCENT PROJECTING GROWTH/CONTRACTION FOR 2018 & 2019: BY REGION



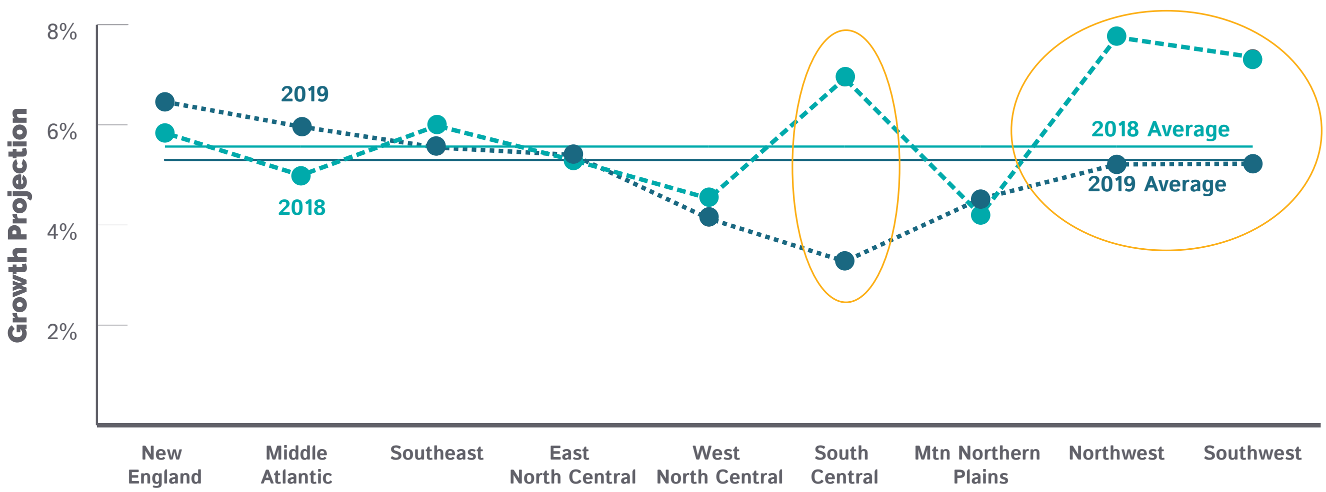
Region	States
New England	Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, Vermont
Middle Atlantic	District of Columbia, Delaware, Maryland, New Jersey, New York, Pennsylvania
Southeast	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia
East North Central	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin, West Virginia
West North Central	Iowa, Kansas, Missouri, Nebraska
South Central	Arkansas, Louisiana, New Mexico, Oklahoma, Texas
Mountain Northern Plains	Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming
Northwest	Alaska, Idaho, Oregon, Washington
Southwest	Arizona, California, Hawaii, Nevada

As illustrated in **Exhibit 2.9**, calculations to determine the average growth/contraction ratings show that four of the nine regions had higher results this year: New England, Middle Atlantic, East North Central and Mountain Northern Plains. As a reminder, the analyses for these averages include all ratings—growth, shortage and no change—whereas the statistics in the colored bar charts in this section look at just the growth and shortage data and show what percent of the responses fell into each rating category.

The most pronounced differences from 2018 to 2019 were for the South Central region and the Western part of the United States, the Northwest and Southwest regions. In these regions 2019 projections were around three to four percent lower than last year.

Exhibit 2.9

AVERAGE GROWTH/CONTRACTION PROJECTIONS FOR 2018 & 2019: BY REGION



As is the case throughout this section for the three other data cuts—role, industry and region—the data in **Exhibit 2.10** show that the overall ratings for 2019 are similar—but a little lower—to 2018 (see Total on the right side of each bar chart). Data show that results comparing organization size were mostly consistent from 2018 to 2019, with the exception of those respondents from organizations with more than 10,000 employees. In these large organizations the percent of those in the study sample indicating growth dropped from 85% to 66%, and those responding "strong growth" fell from 47% to 21%.

Ratings for four organization sizes increased modestly from 2018 to 2019: 1-25 Employees, 101-500 Employees, 1,001-5,000 Employees and 5,001-10,000 Employees.

Exhibit 2.10

PERCENT PROJECTING GROWTH/CONTRACTION FOR 2018 & 2019: BY ORGANIZATION SIZE

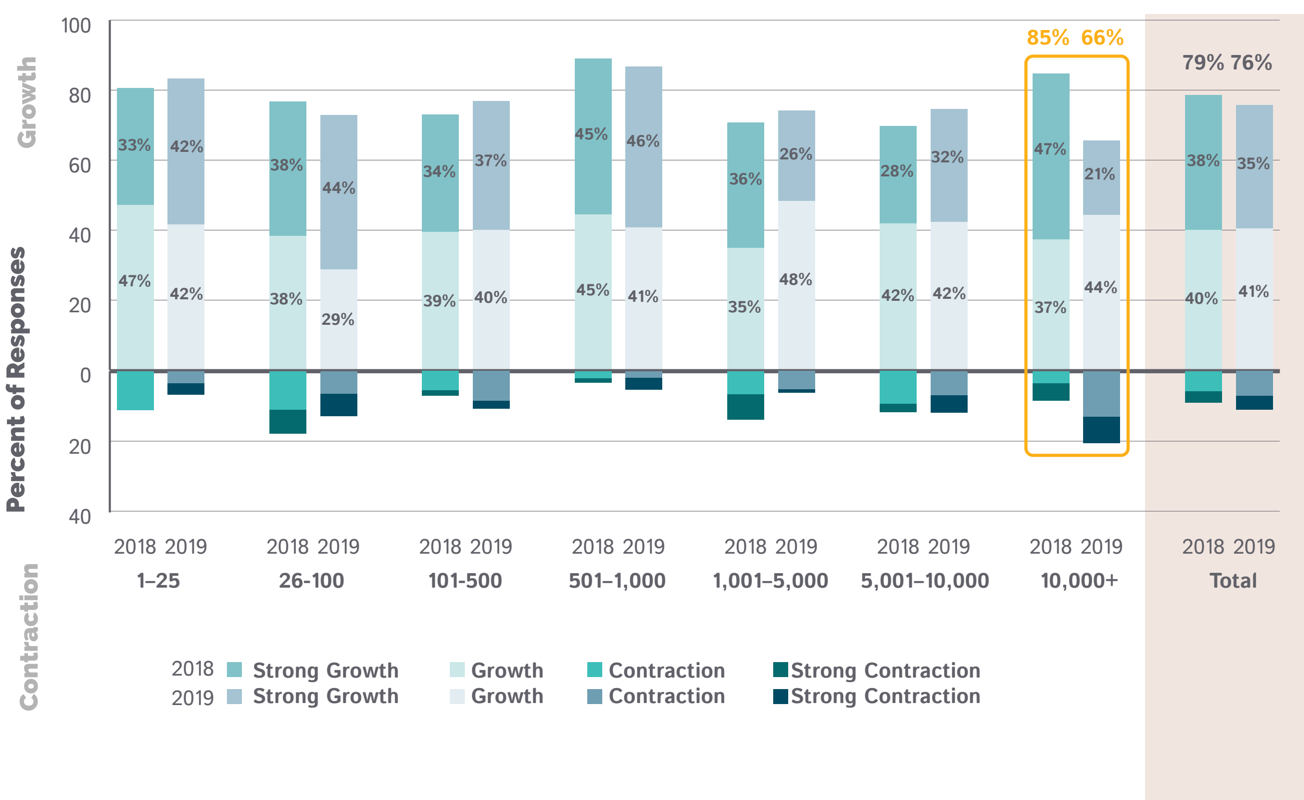
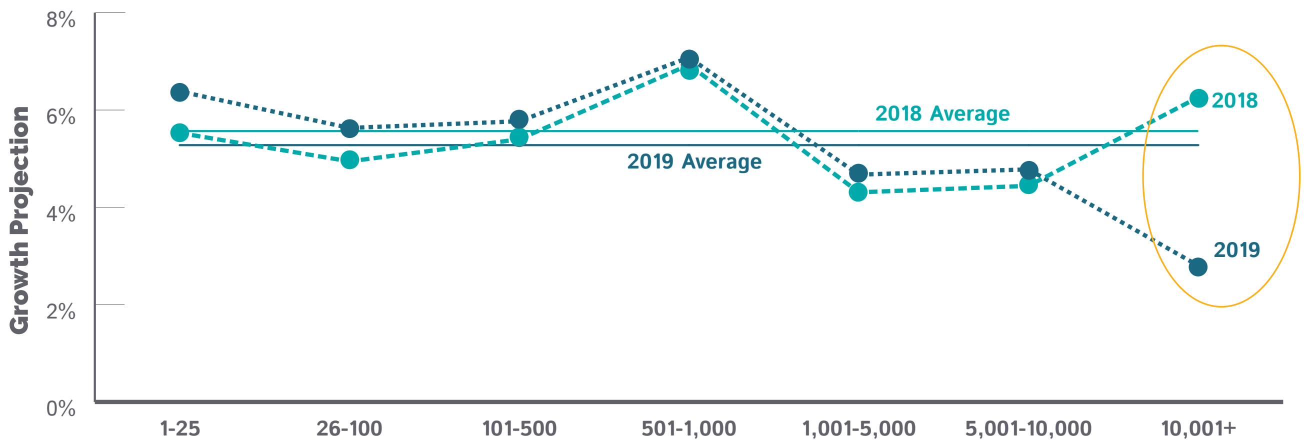


Exhibit 2.11 reflects findings similar to **Exhibit 2.10** — in particular the discrepancy between this year and last year for the largest organizations. It also shows that the average growth estimates for 2019 are higher for smaller organizations (i.e., less than 1,001 employees). The average for organizations with 1,000 or fewer employees is 6.2% growth; the average for those with at least 1,001 employees is 4.2%.

Exhibit 2.11

AVERAGE GROWTH/CONTRACTION PROJECTIONS FOR 2018 & 2019: BY ORGANIZATION SIZE



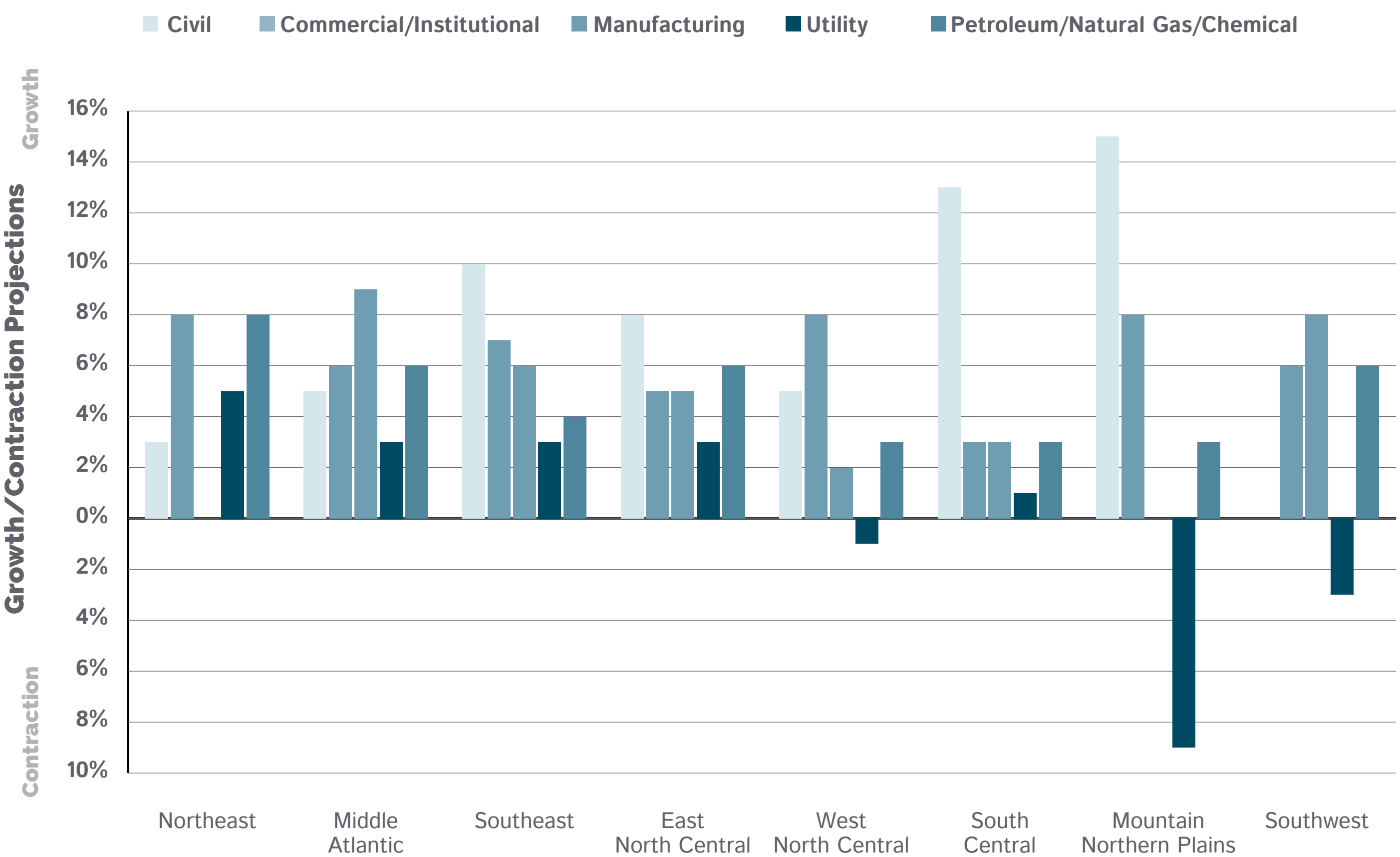
The growth/contraction projections were further analyzed by looking at the data in an even more detailed manner: industry by region. In other words, the growth/contraction ratings were examined for each industry in each region. **Exhibit 2.12** shows the results.

Highlights of **Exhibit 2.12** include the following:

- The Civil industry is strongest in the South Central and Mountain Northern Plains regions. In fact, these are the highest ratings in **Exhibit 2.12.**
- The Commercial/Institutional industry is consistent across all regions (6.2% – 8.3%), with the exception of the South Central region (3.0%).
- The Manufacturing industry had its largest percent of respondents reporting growth in the Middle Atlantic and Southwest regions.
- The Utility industry is generally weaker than the other industries, including the only ratings with contraction (West North Central, Mountain Northern Plains and Southwest regions).
- The Petroleum/Natural Gas/Chemical industry is strongest in the New England region.

Exhibit 2.12

GROWTH/CONTRACTION PROJECTIONS: INDUSTRY BY REGION



Exhibits 2.13 – 2.16 aggregate the ratings into three categories: contraction, no change and growth. Results are displayed using a separate chart for each industry.

As expected, the growth category dominates. Closer inspection shows the variances across the regions for each craft.

Exhibit 2.13

PERCENT OF RESPONSES PROJECTING GROWTH/CONTRACTION: CIVIL

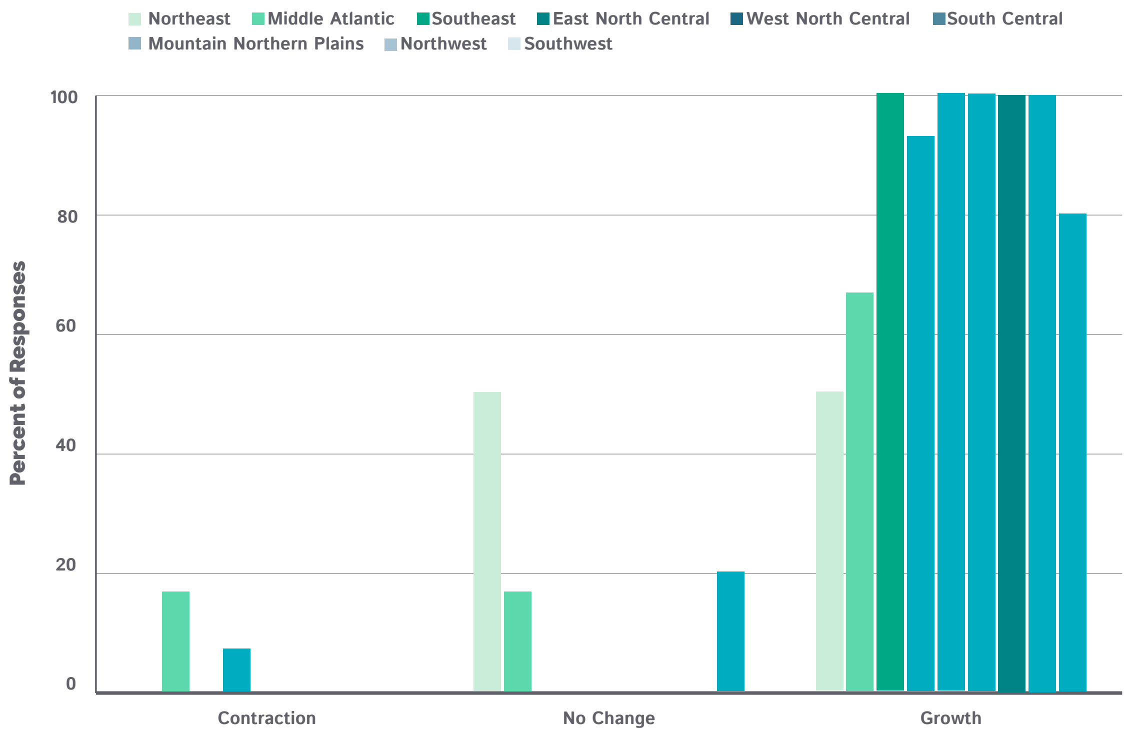


Exhibit 2.14

PERCENT OF RESPONSES PROJECTING GROWTH/CONTRACTION: COMMERCIAL/ INSTITUTIONAL

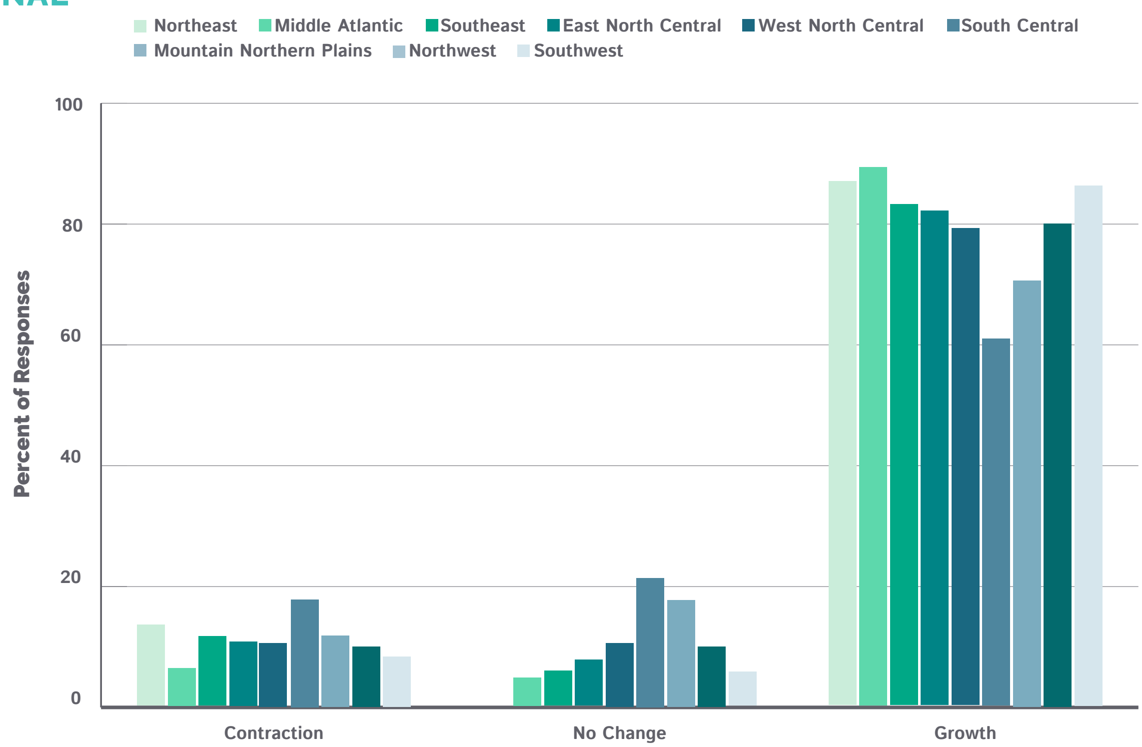


Exhibit 2.15

PERCENT OF RESPONSES PROJECTING GROWTH/CONTRACTION: MANUFACTURING

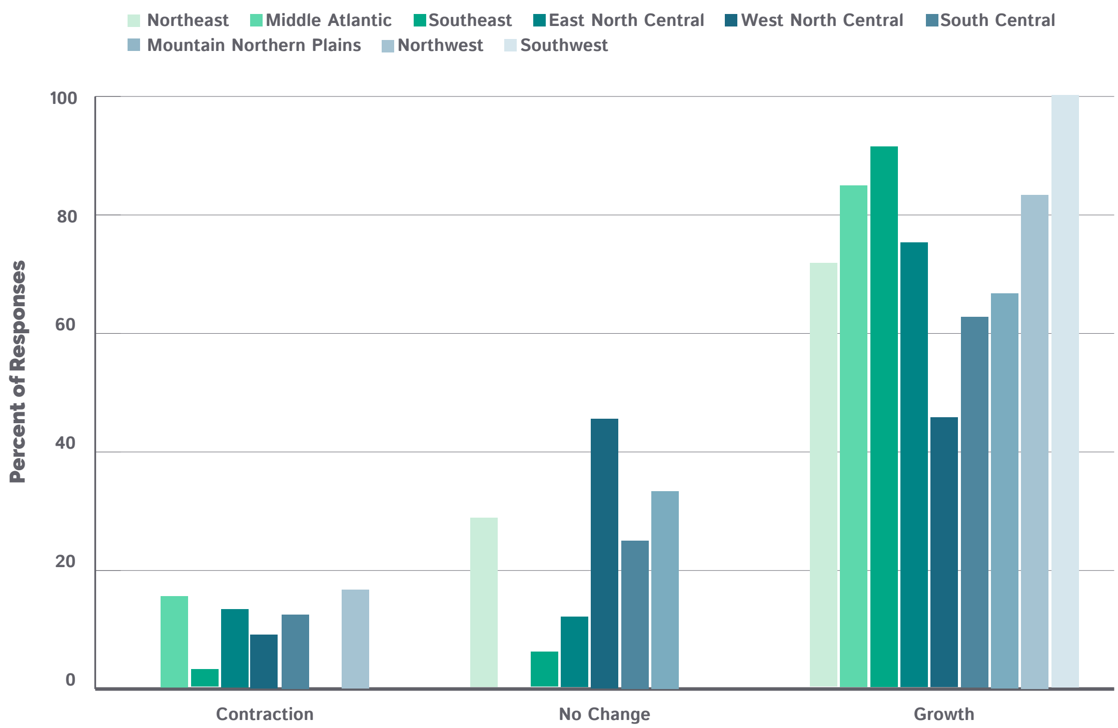


Exhibit 2.16

PERCENT OF RESPONSES PROJECTING GROWTH/CONTRACTION: UTILITY

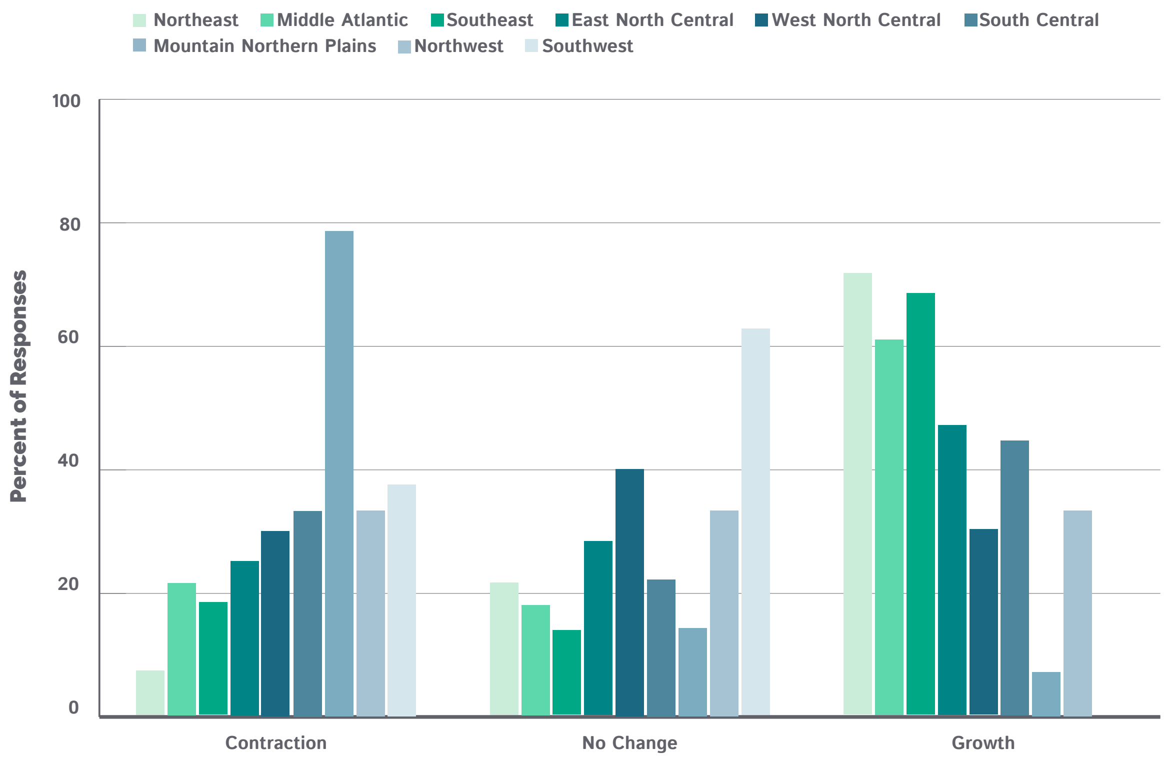
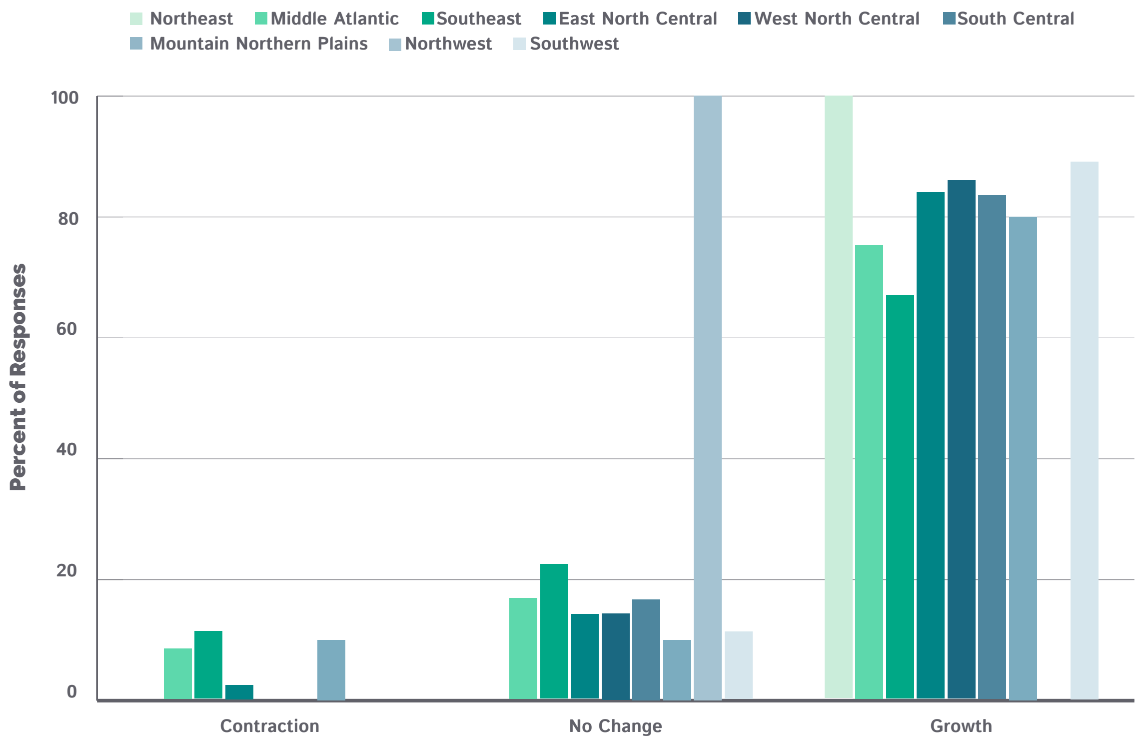


Exhibit 2.17

PERCENT OF RESPONSES PROJECTING GROWTH/CONTRACTION: PETROLEUM/NATURAL GAS/CHEMICAL



III. UNION CRAFT LABOR SHORTAGE AND SURPLUS

Section III refers specifically to *union craft labor*. This section describes how respondents reported the union craft labor shortage or surplus in their organization in 2018 (versus what they *assume* was happening in other organizations where they do not have first-hand knowledge). These can be considered as "actual" results since respondents reported their company's experience from the previous year (not more subjective projections for upcoming years).

Similar to the layout of **Section II**, **Section III** provides results in two parts:

- **Part 1.** Overall Union Craft Labor Shortage/Surplus
- **Part 2.** Union Craft Labor Shortage/Surplus by Demographic Data Cut
    - Role
    - Industry
    - Industry by Region
    - Region
    - Organization Size

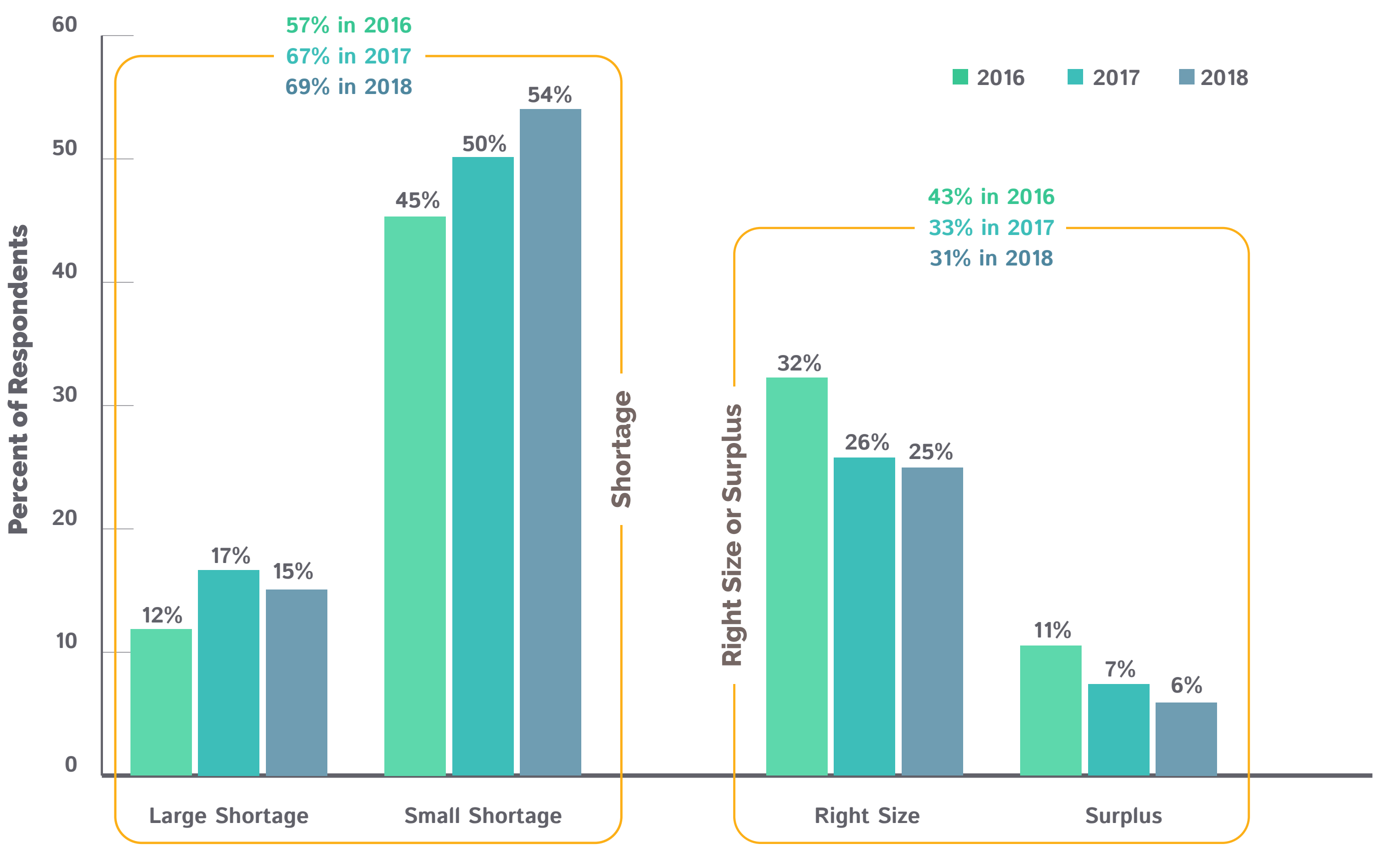
Part 1. Overall Union Craft Labor Shortage/Surplus

Exhibit 3.1 shows that *more and more people who are familiar with the union construction and maintenance industry are reporting a union craft labor shortage*. To illustrate, in 2015, 52% reported a shortage in their organization (see previous report); three years later this had grown to 69%. As a result and necessarily so, the percent of respondents recording a surplus or the right number of union craft labor in their organization decreased from 48% in 2015 to 31% in 2018.

While over two thirds of the participants in this study reported a union craft labor shortage, it is also important to note that the majority of these said they had a "small shortage" in their organization. Fifteen percent said the shortage they experienced was a "large shortage," down from 17% last year.

Exhibit 3.1

UNION CRAFT LABOR SHORTAGE: 2016-2018

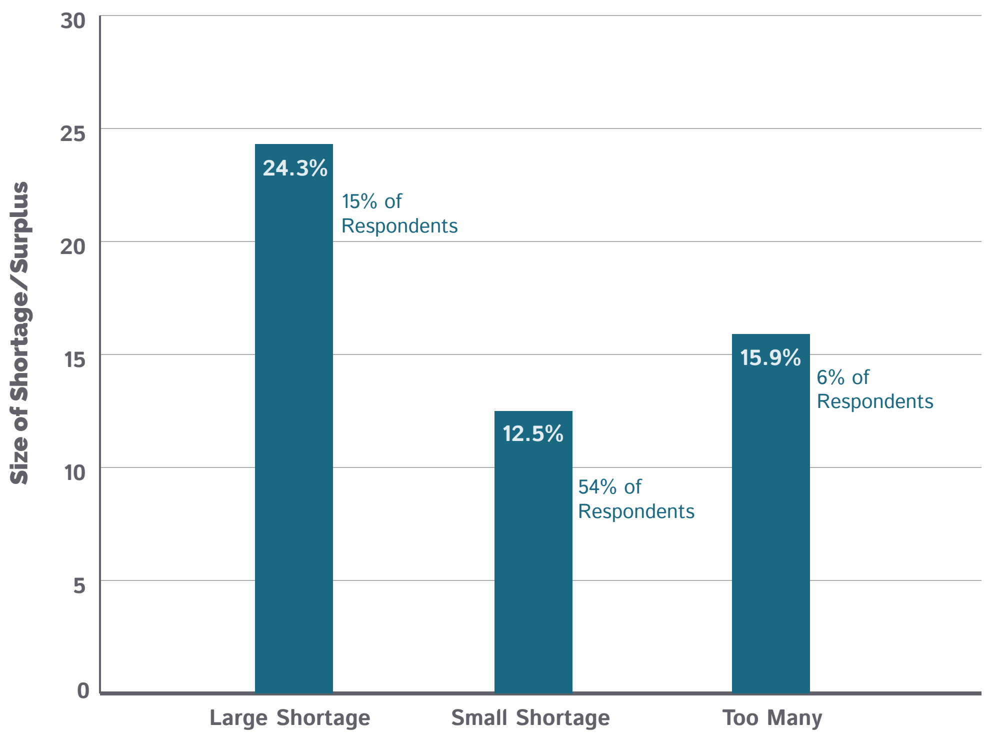


The questionnaire used in the study asked participants to indicate what they meant when they responded to the terms “Large Shortage” and “Small Shortage.” **Exhibit 3.2** empirically summarizes how respondents view a large and small shortage. A large shortage was a shortage of 24.3%, on average; a small shortage was about half that at 12.5%. The average overage of too many union craft labor was 15.9%.

It should be noted that respondents were asked to rate the entire year 2018. It is likely that their organization experienced ebbs and flows throughout the course of the year in its union craft labor supply. **Exhibit 3.2** shows the annual average.

Exhibit 3.2

AVERAGE SIZE OF SHORTAGE AND SURPLUS



Note, **Exhibit 3.2** shows the actual size of the reported shortages and surpluses. The values in blue fonts outside the bars refer to the percent of respondents providing that response.

Part 2. Union Craft Labor Shortage/ Surplus by Demographic Data Cut

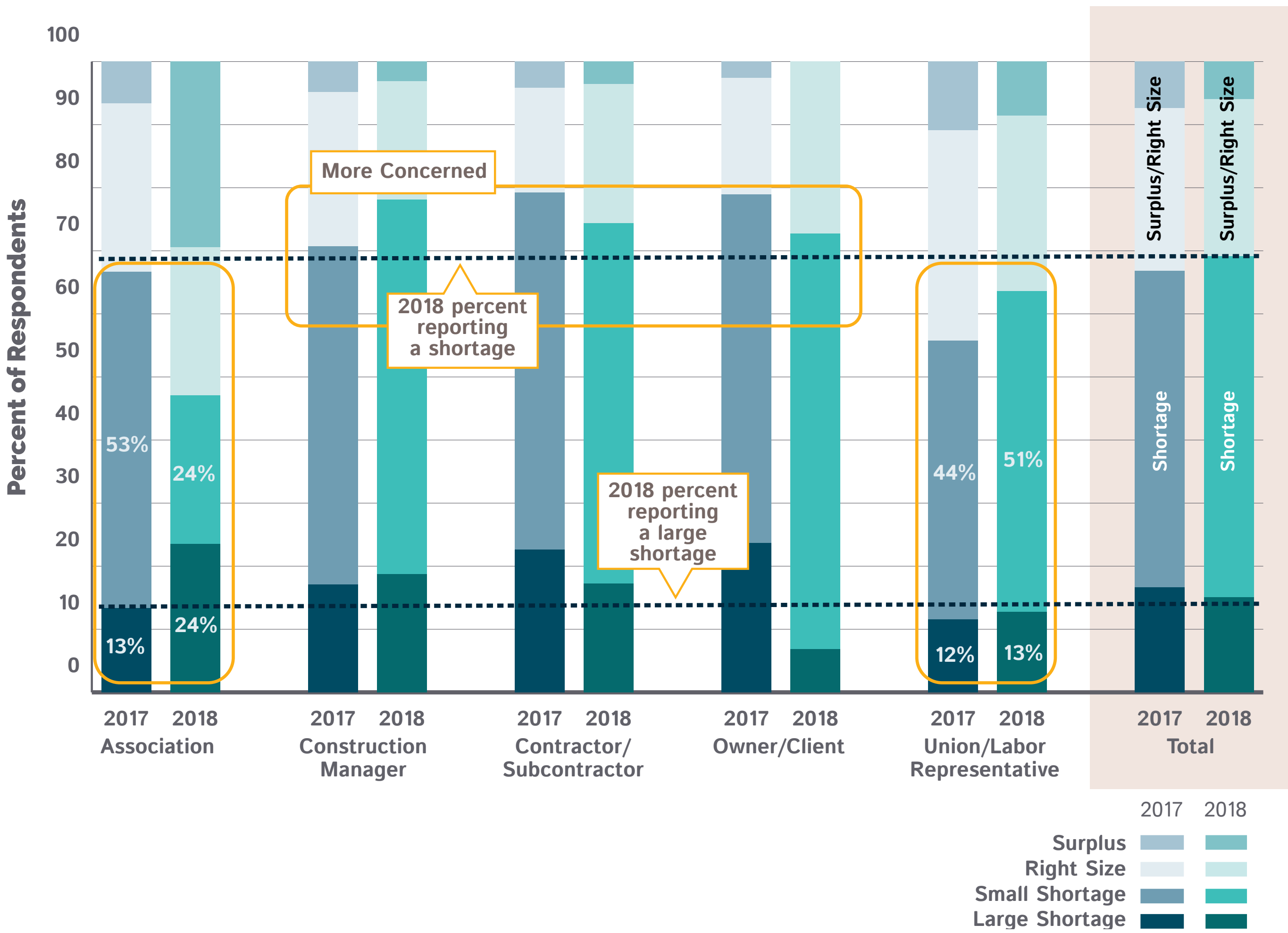
Exhibits 3.3 – 3.6 show results for the union craft labor supply in 2018 (and 2017 for comparison) by four data cuts: role, industry, region and organization size. *The different colors in the bars represent the percent of the sample providing each rating (i.e., large shortage, small shortage, right size, surplus), not the actual percent of shortage or surplus in the union craft workforce.*

In **Exhibit 3.3**, the results for 2017 and 2018 from **Exhibit 3.1** are broken out by respondent role. The role with the greatest change was Association Employee. Two interesting things happened with them from 2017 to 2018: the percent reporting some sort of a shortage fell sharply (66% to 48%) while the percent reporting a large shortage increased (13% to 24%). The Union/ Labor Representative role saw an increase in the percent seeing a labor shortage (56% to 64%).

The Association and Union roles were the only two below the average. The Construction Manager, Contractor/Subcontractor and Owner roles all were above the average. This finding is consistent with previous years where more Contractors and Owners felt a labor shortage, and they felt it more significantly (i.e., large shortage vs small shortage), than their Association and Labor counterparts.

Exhibit 3.3

UNION CRAFT LABOR SHORTAGE/SURPLUS IN 2017 & 2018: BY ROLE



As shown in **Exhibit 3.4**, *the industry with the greatest proportion of the sample reporting a union craft labor shortage for 2018 was Utility, where 83% reported a shortage of some type. This was a substantial jump from last year where 54% reported a shortage. Moreover, over a fourth (27%) said their organization experienced a large shortage of union craft labor in the Utility industry in 2018.*

Last year's greatest concerns were with Manufacturing. This year it also generated many reports of shortages, the second most of the industries studied. The industry with the fewest concerns was Commercial/Institutional, yet there was a modest increase from 2017 to 2018 and 60% still reported a shortage. The largest percent of respondents reporting a surplus was also in this industry (10%).

Exhibit 3.4

UNION CRAFT LABOR SHORTAGE/SURPLUS IN 2017 & 2018: BY INDUSTRY

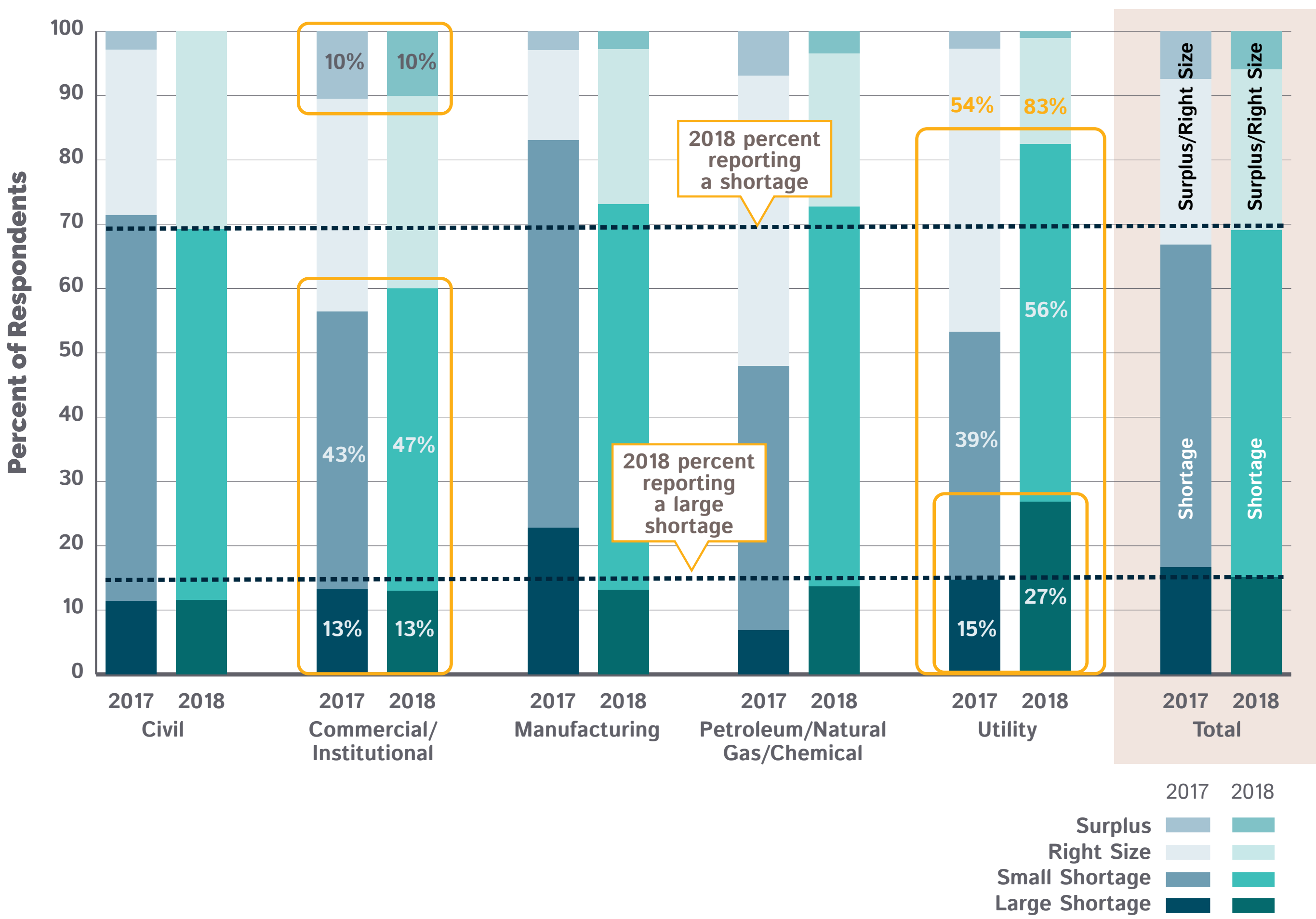
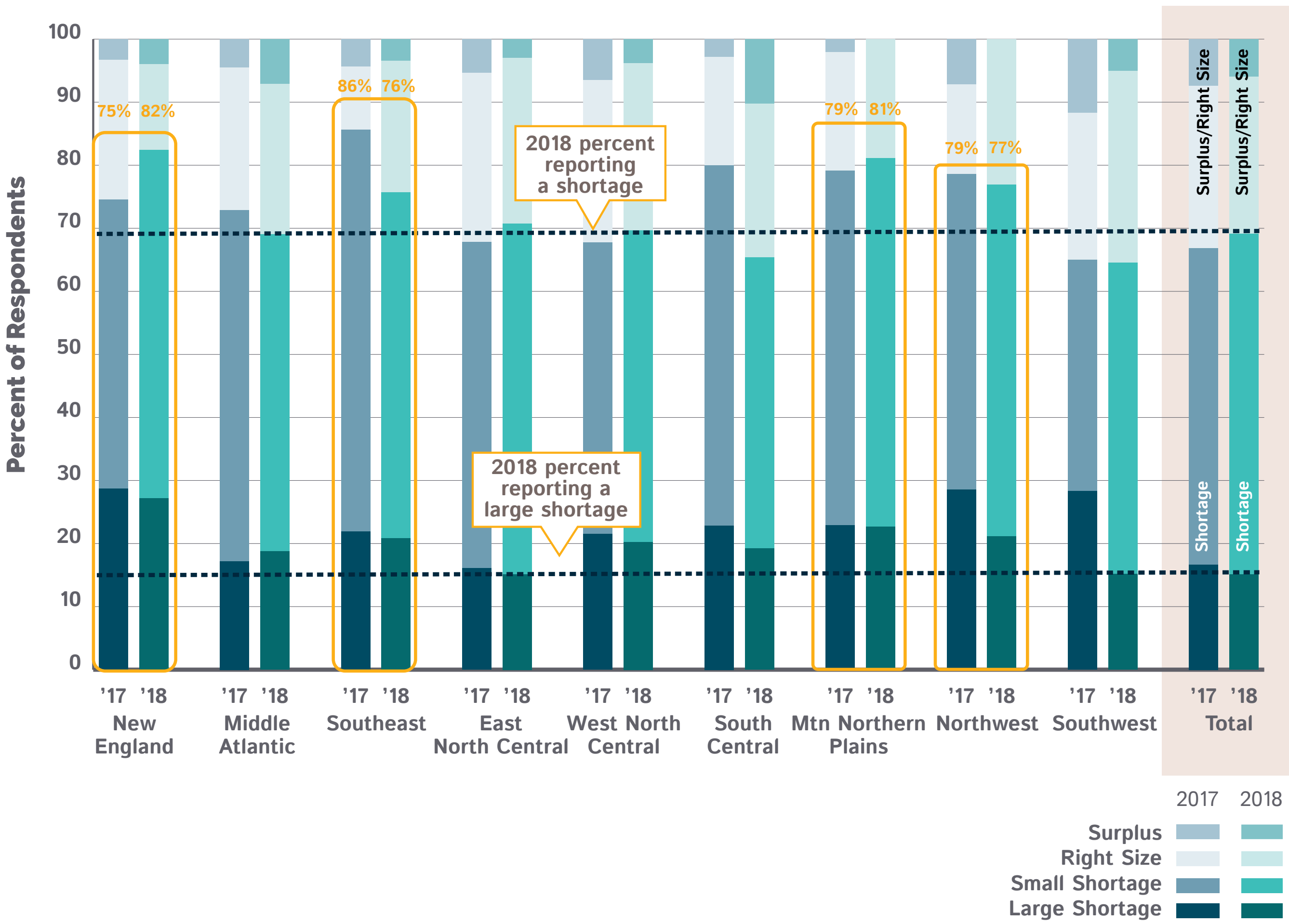


Exhibit 3.5 shows analyses on the union craft labor shortage/surplus data by region. *Overall, in 2018 the shortages were greatest in the New England (82% reporting a shortage, 27% a large shortage), Southeast (76%, 21%), Mountain Northern Plains (81%, 23%) and Northwest (77%, 21%) regions.*

The largest jumps in union craft labor shortages occurred in the New England region where there was a 7% increase. The largest change, however, was in the South Central region where 15% fewer respondents reported a shortage in 2018 (80%) than in 2017 (65%).

Exhibit 3.5

UNION CRAFT LABOR SHORTAGE/SURPLUS IN 2017 & 2018: BY REGION



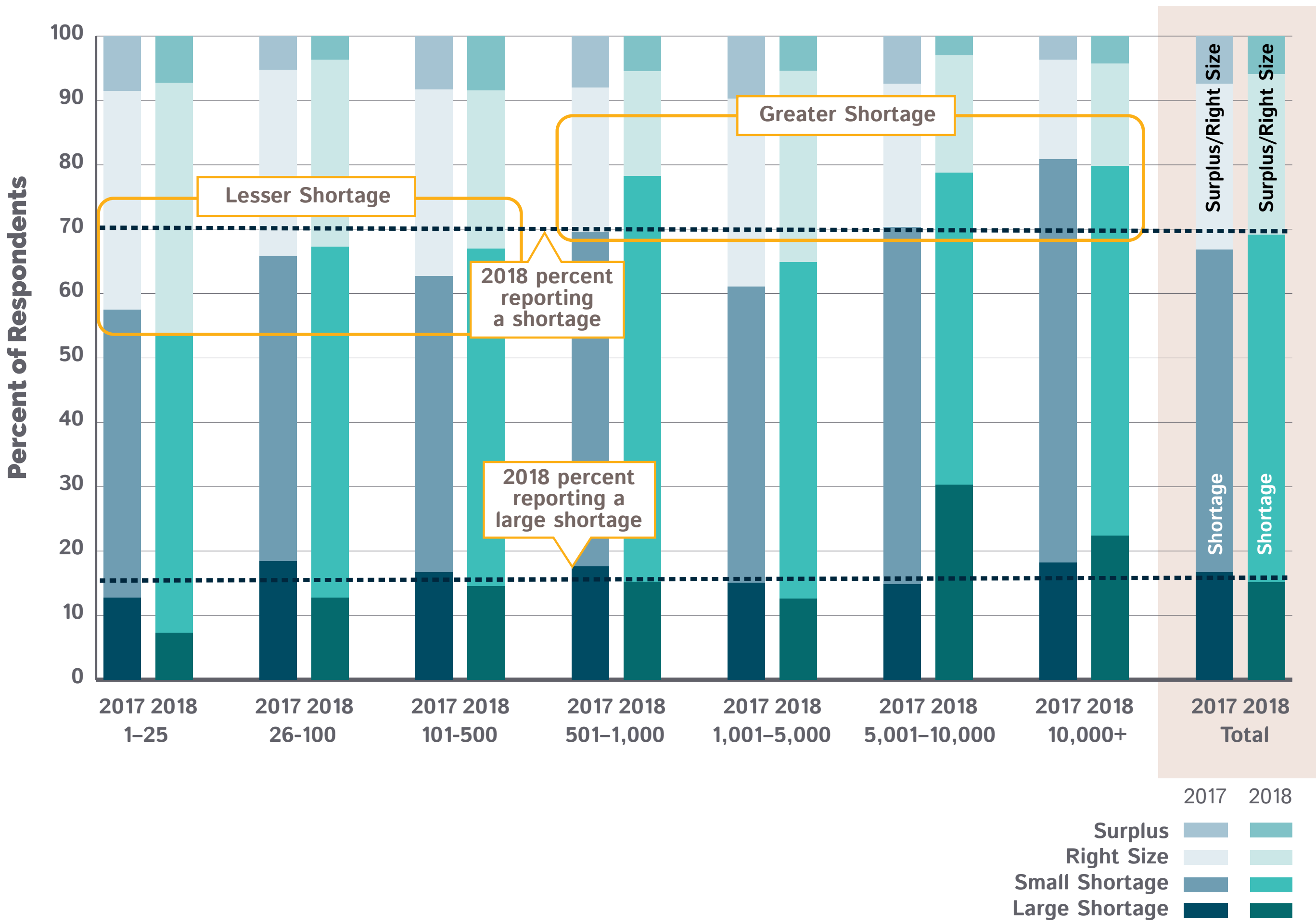
Region	States
New England	Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, Vermont
Middle Atlantic	District of Columbia, Delaware, Maryland, New Jersey, New York, Pennsylvania
Southeast	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia
East North Central	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin, West Virginia
West North Central	Iowa, Kansas, Missouri, Nebraska
South Central	Arkansas, Louisiana, New Mexico, Oklahoma, Texas
Mountain Northern Plains	Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming
Northwest	Alaska, Idaho, Oregon, Washington
Southwest	Arizona, California, Hawaii, Nevada

As displayed in **Exhibit 3.6** *the larger organizations perceived a greater shortage of union craft labor than smaller ones, with the exception of organizations with 1,001–5,000 Employees*. These results, combined with those in **Exhibits 2.9 and 2.10** where larger organizations projected less growth than smaller ones, suggest that employees representing larger organizations have a more concerned perspective about growth and labor supply than those in smaller ones.

Organizations with 501–1,000 and 5,001–10,000 Employees produced the biggest jumps from 2017 to 2018.

Exhibit 3.6

UNION CRAFT LABOR SHORTAGE/SURPLUS IN 2017 & 2018: BY ORGANIZATION SIZE



In order to gain an even better understanding of the worker shortage/surplus data, the interaction between industry and geographic region was studied. That is, in **Exhibits 3.7 – 3.15** each of the nine charts represents a different geographic region. Within each chart, the percent of ratings that fall in each rating option is shown for each of the five industries.

These charts are valuable in order to pinpoint more precisely where the union craft labor shortages (and surpluses) exist relative to two parameters simultaneously: industry and region.

Exhibit 3.7

SHORTAGE/SURPLUS: NEW ENGLAND

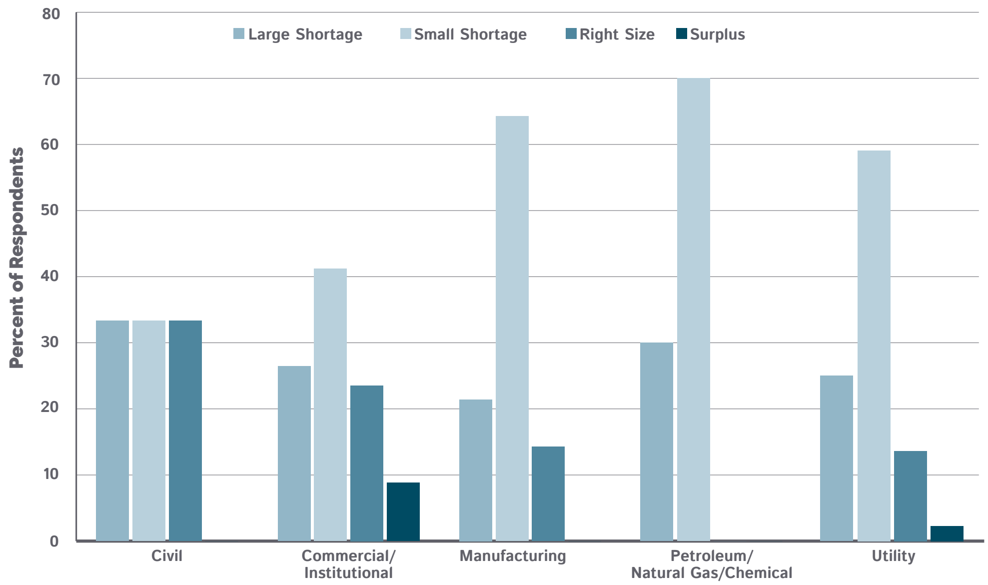


Exhibit 3.8

SHORTAGE/SURPLUS: MIDDLE ATLANTIC

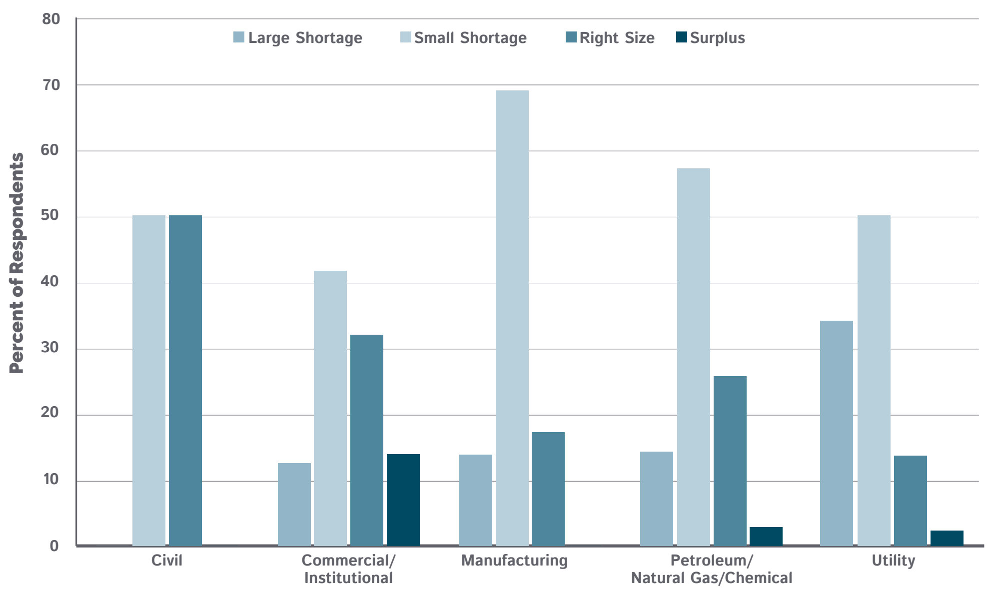


Exhibit 3.9

SHORTAGE/SURPLUS: SOUTHEAST

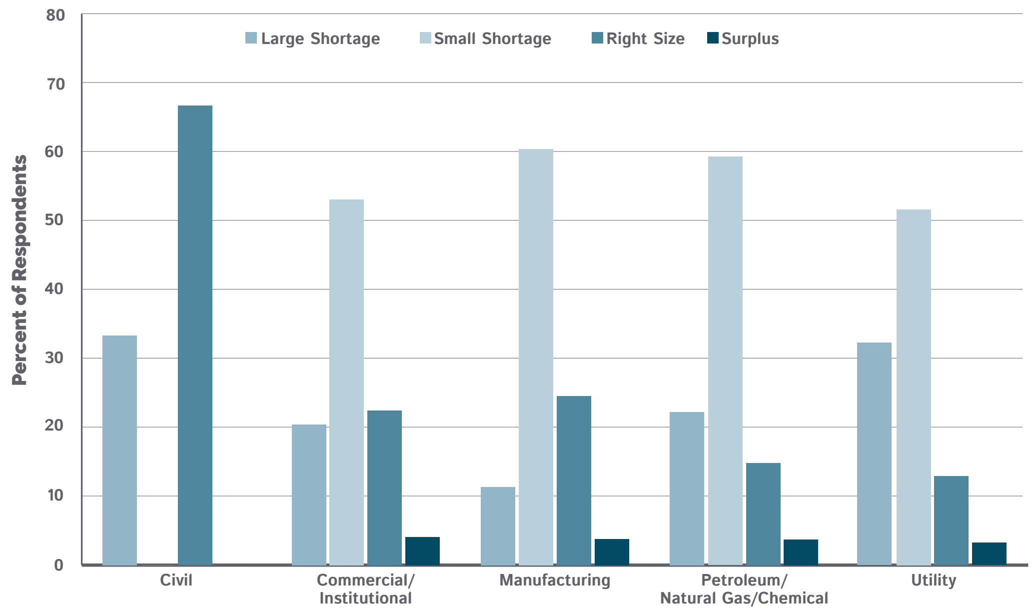


Exhibit 3.10

SHORTAGE/SURPLUS: EAST NORTH CENTRAL

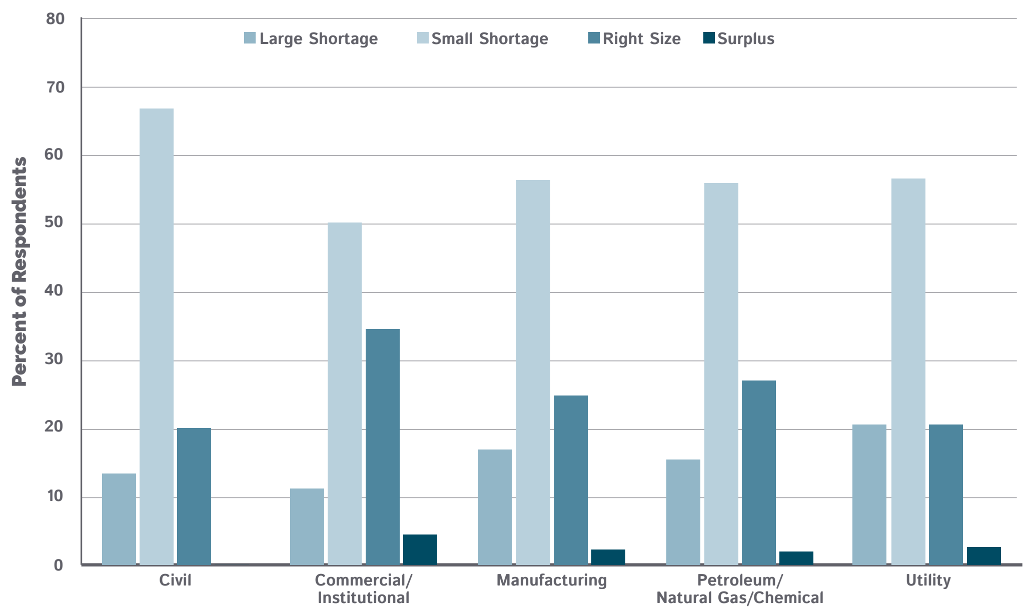


Exhibit 3.11

SHORTAGE/SURPLUS: WEST NORTH CENTRAL

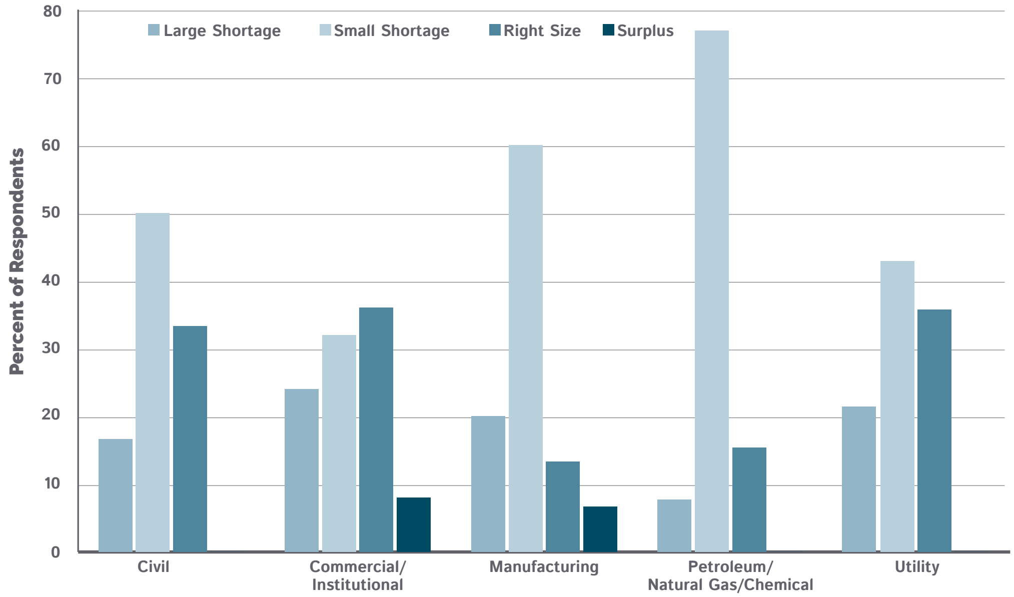


Exhibit 3.12

SHORTAGE/SURPLUS: SOUTH CENTRAL

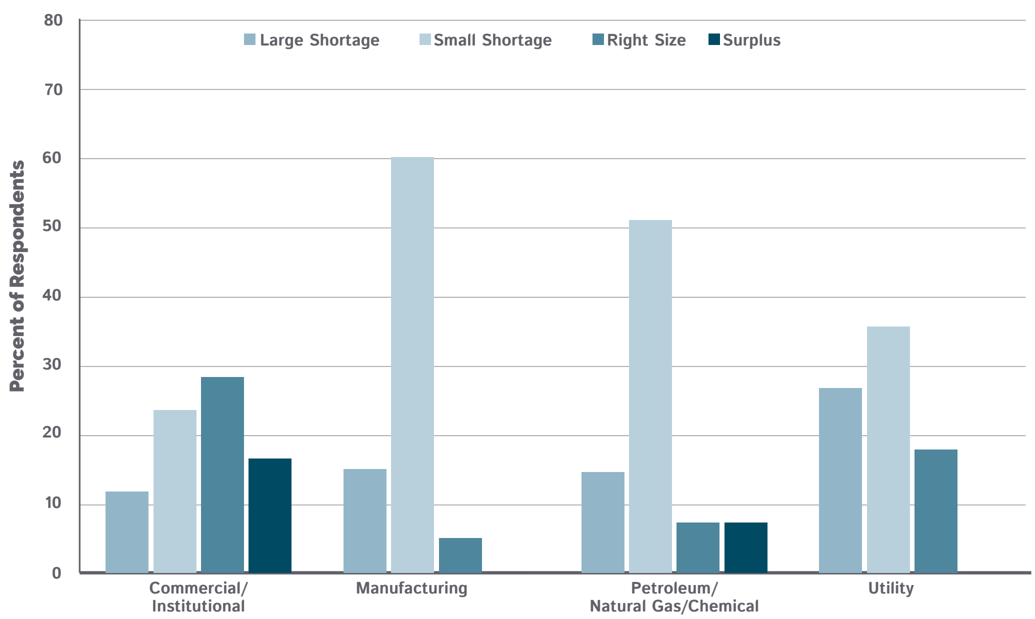


Exhibit 3.13

SHORTAGE/SURPLUS: MOUNTAIN NORTHERN PLAINS

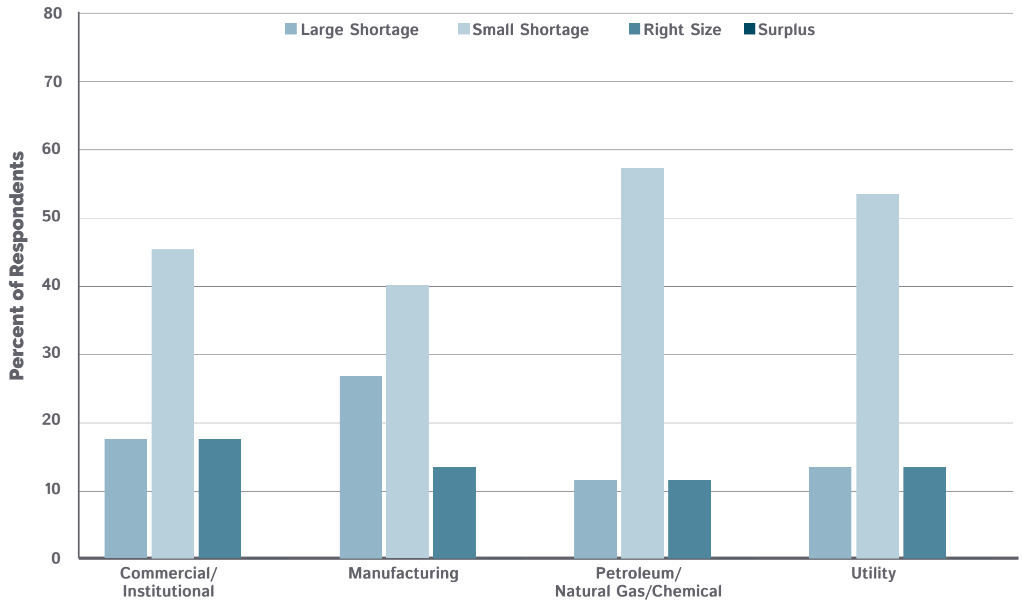


Exhibit 3.14

SHORTAGE/SURPLUS: NORTHWEST

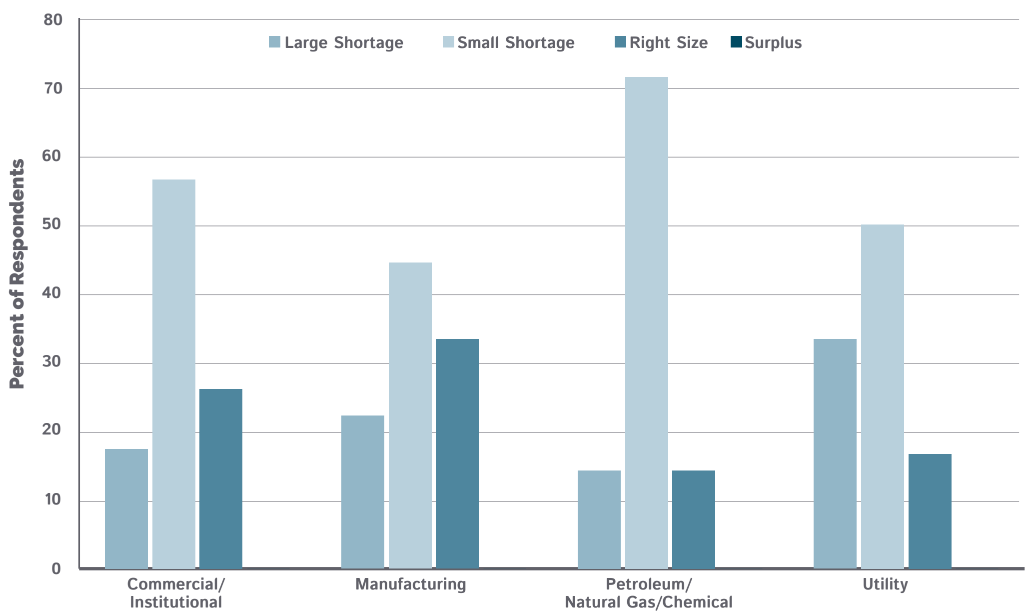
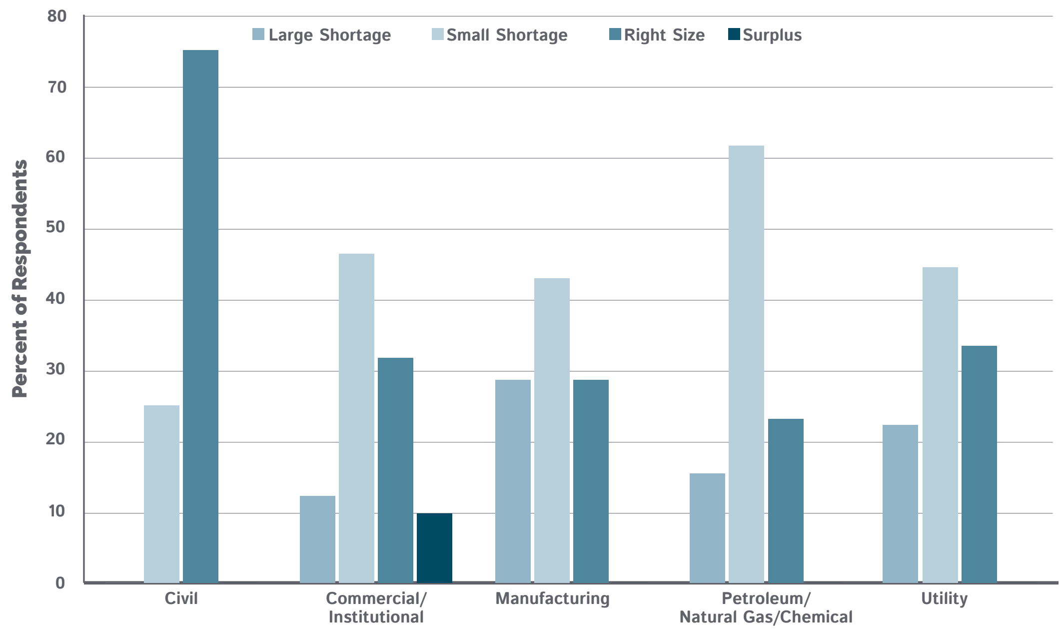


Exhibit 3.15

SHORTAGE/SURPLUS: SOUTHWEST



IV. Union Craft Labor Shortage and Surplus—Craft Comparison

The findings in **Section IV** are organized into four parts. Comparisons among the 14 crafts covered in this study will be shown for the first three parts.

- **Part 1.** Actual Shortage/Surplus in 2018
- **Part 2.** Projected Shortage/Surplus for 2019
- **Part 3.** Actual Shortage/Surplus in 2018 for Apprentices
- **Part 4.** Difficult to Find, High Demand Skills

Within **Parts 1-3** listed above, results will be shown in two ways. First, by *prevalence* by listing the percent of the study participants for each craft whose ratings fell into four categories:

- Shortage (1% – 6%)
- Large Shortage (7% and greater)
- Surplus (1% – 6%)
- Large Surplus (7% and greater)

Second, by *intensity* by showing the average shortage/surplus rating for each craft. Whereas the shortage/surplus colored bar charts described above show the percent of responses in each category (and do not include those who said their organization had neither a shortage nor a surplus), the line charts convey the average rating and take *all ratings* into consideration in calculating the overall average, including those who said 0% (i.e., no shortage or surplus).

Part 4 lists the results for open ended questions in the study questionnaire which asked participants to list the skills/tasks that were the most difficult to fill in their organization.

It is useful to note that the values shown for **Exhibits 4.2, 4.4 and 4.6** are the average of all ratings—those reporting a shortage, those reporting a surplus and those reporting neither. Although the line graphs are valuable because they concisely and accurately summarize all ratings, the shortage ratings (negative values in the analysis) and surplus ratings (positive values) tend to cancel each other out somewhat when calculating the average.

As a result, the averages contained in the line graphs look somewhat "muted." In other words, if the average were calculated separately for only those reporting a shortage the values would be much larger or more pronounced. Similarly, an average calculated only on a subset of the study sample containing just those reporting a surplus would be more pronounced as well.

The percentages shown in the **Exhibits 4.1, 4.3 and 4.5** in the colored bars may not sum to 100% within each bar. This is because those who reported that there was neither a shortage nor a surplus in their organization are not shown.

Exhibits 4.1, 4.3 and 4.5 show the percent (prevalence) of responses falling into each surplus/shortage category. **Exhibits 4.2, 4.4 and 4.6** show the size of the shortage/surplus. This can be called the intensity of the shortage/surplus.

Part 1. Actual Shortage/Surplus in 2018

Exhibits 4.1 and 4.2 focus on the union craft labor supply last year, in 2018, with comparison data for 2017.

Exhibit 4.1 illustrates, by craft, what percent of the ratings in this study fell into four rating categories: shortage, large shortage, surplus and large surplus. This is the *prevalence* of the shortage/surplus. Data are sorted in descending order based on the percent reporting a union craft labor shortage in their organization in 2018. Results for 2017 are paired with the 2018 data for each craft as a useful point of comparison.

Results show that the most frequently reported shortages for 2018 were with Boilermakers, Carpenters & Millwrights, Iron Workers and Plumbers, Pipefitters & Steamfitters. All of these had at least 60% of the responses reporting a shortage of union craft workers and 25% classifying their shortage as a large shortage. Interestingly, each of these crafts has welders, the number one reported needed skill (see ***Exhibit 4.7****).*

Three crafts had a large jump in reported shortages: Boilermakers, Heat & Frost Insulators and Bricklayers & Allied Crafts. Electricians and Roofers & Waterproofers were the only two crafts where fewer data points in 2018 indicated a shortage than in 2017.

On average, 55% of the sample for these craft specific items in **Section IV** said there had been a union craft worker shortage in their organization in 2018 and 7% said there was a surplus. An interesting point of comparison are the results in **Section III** for the more general question, "Did your organization experience a union craft labor shortage in 2018?"

Those results in **Section III** were that 69% said there was a shortage in their organization (see **Exhibit 3.1**). Thus, tallying data for each specific craft (**Section IV**) resulted in a lower percent (55%) reporting a shortage than when a general question about union craft labor shortage was asked (69% in **Section III**). The reasons for this difference are that the data come from different questions with different rating scales. Additionally, respondents provided answers when thinking about each craft individually in **Section IV** rather than all crafts combined as in **Section III**.

Exhibit 4.1

PERCENT OF RESPONSES INDICATING A SHORTAGE OR SURPLUS IN 2017 & 2018 BY CRAFT—DESCENDING ORDER

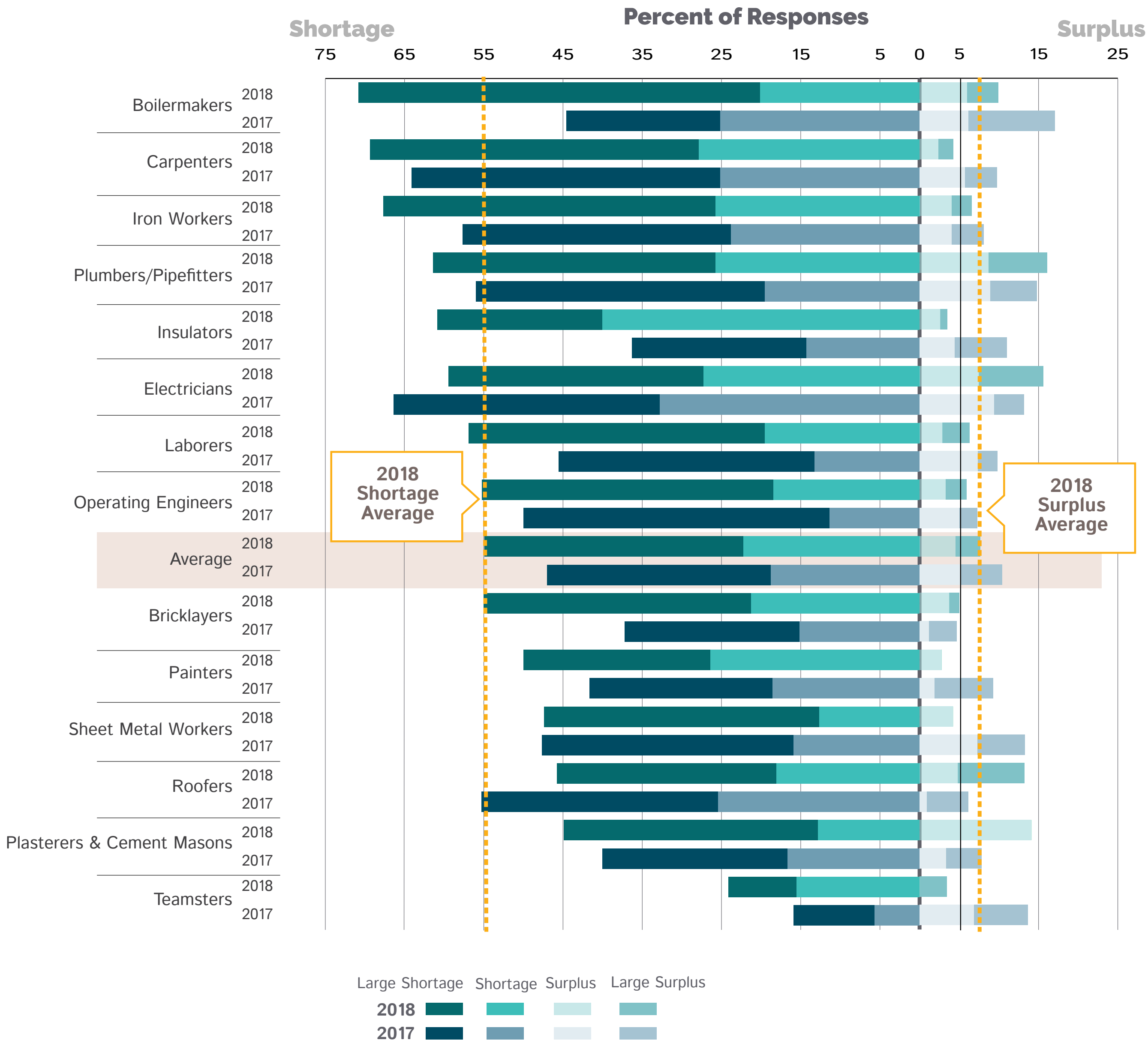


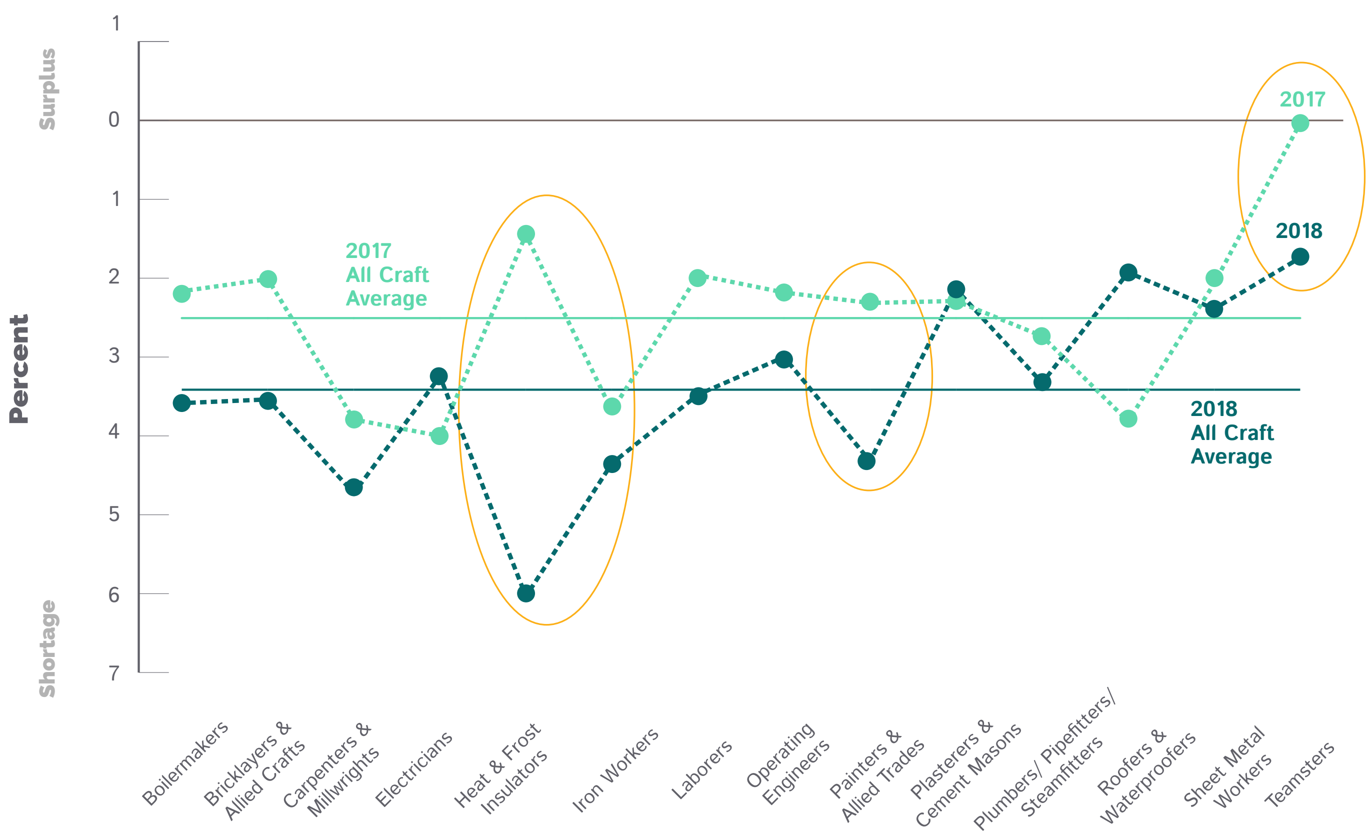
Exhibit 4.1 contains results concerning *prevalence*, the percent of the responses that fall into each of the four different shortage and surplus rating options. As a complimentary analysis, **Exhibit 4.2** below shows the average shortage or surplus rating for each craft, the *intensity* of the shortage. There is general agreement between these two sets of analyses regarding the crafts with the greatest shortage in 2018.

Combining the prevalence results from **Exhibit 4.1** *and the intensity results in* **Exhibit 4.2**, *the following crafts had the most substantial shortages in 2018: Boilermakers, Carpenters & Millwrights, Heat & Frost Insulators and Iron Workers.*

The average shortage in 2017 was 2.5%; it grew substantially to 3.4% for 2018. Most crafts fell in the 3 – 5% range. While there were significant changes from 2017 to 2018 for most crafts, the biggest changes from 2017 to 2018 were for Heat & Frost Insulators, Painters & Allied Trades and Teamsters; each of these had a larger shortage in 2018 than in 2017.

Exhibit 4.2

AVERAGE SHORTAGE/SURPLUS RATING BY CRAFT IN 2017 & 2018



Part 2. Projected Shortage/Surplus in 2019

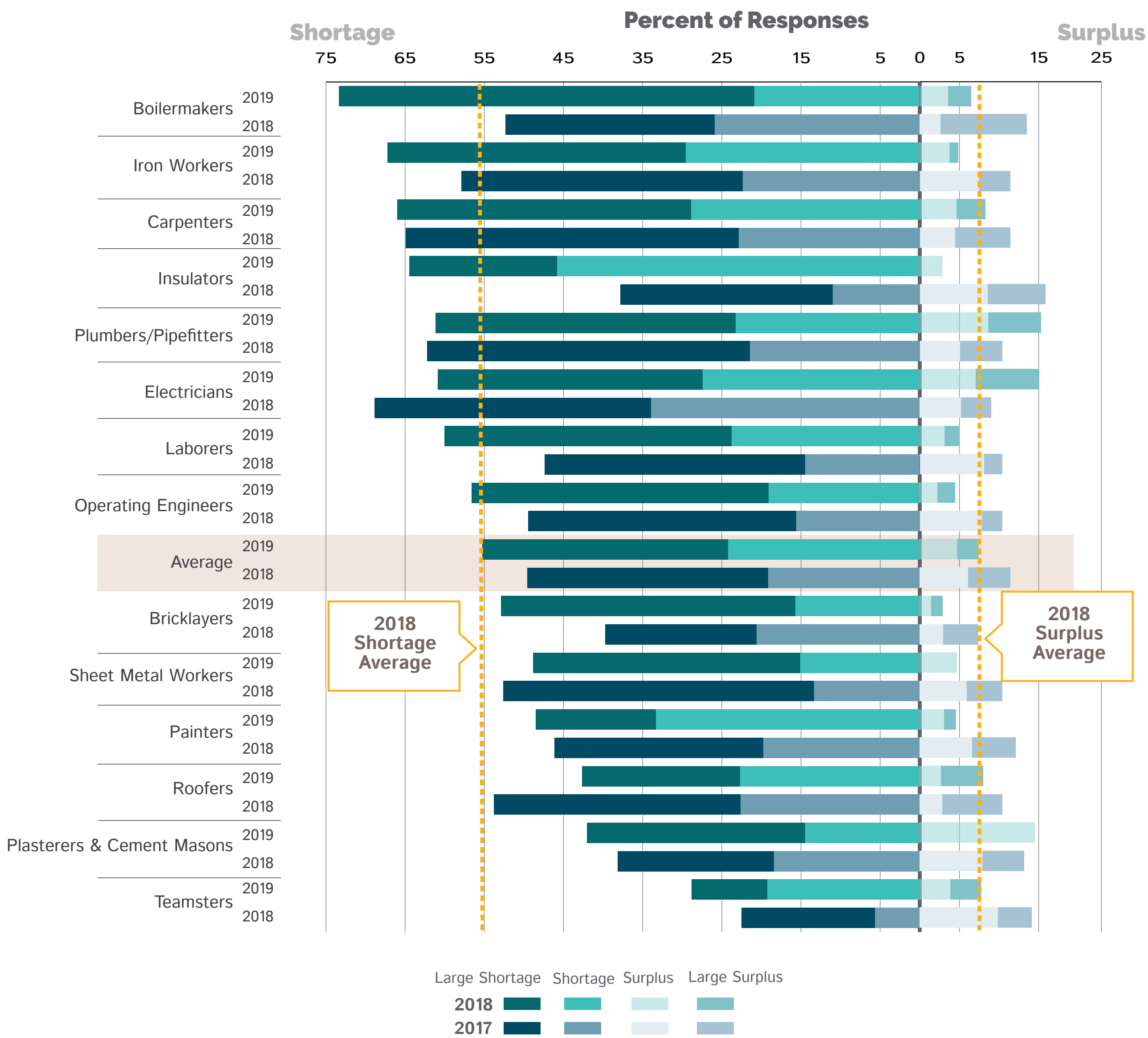
Exhibits 4.3 and 4.4 focus on the projected union craft labor supply for the upcoming year, 2019.

Exhibits 4.1 and 4.2 in Part 1 look back in time at union craft staffing levels in 2018. **Exhibits 4.3 and 4.4** provide a look ahead to respondent projections for 2019. These results are based on the study participants' replies to questions asking them to project the shortage/surplus of union craft labor in 2019 in their organization. The crafts are listed in descending order based on the 2019 data. Data from last year's report are included as points of comparison.

Interestingly, the correlation between the shortages in 2018 and projected shortages for 2019 is very high. In other words, the crafts fall into nearly the same rank order. This suggests that respondents predicted future shortages based on current shortages, as would be expected.

Exhibit 4.3

PERCENT OF RESPONSES PROJECTING A SHORTAGE OR SURPLUS IN 2018 & 2019 BY CRAFT—DESCENDING ORDER

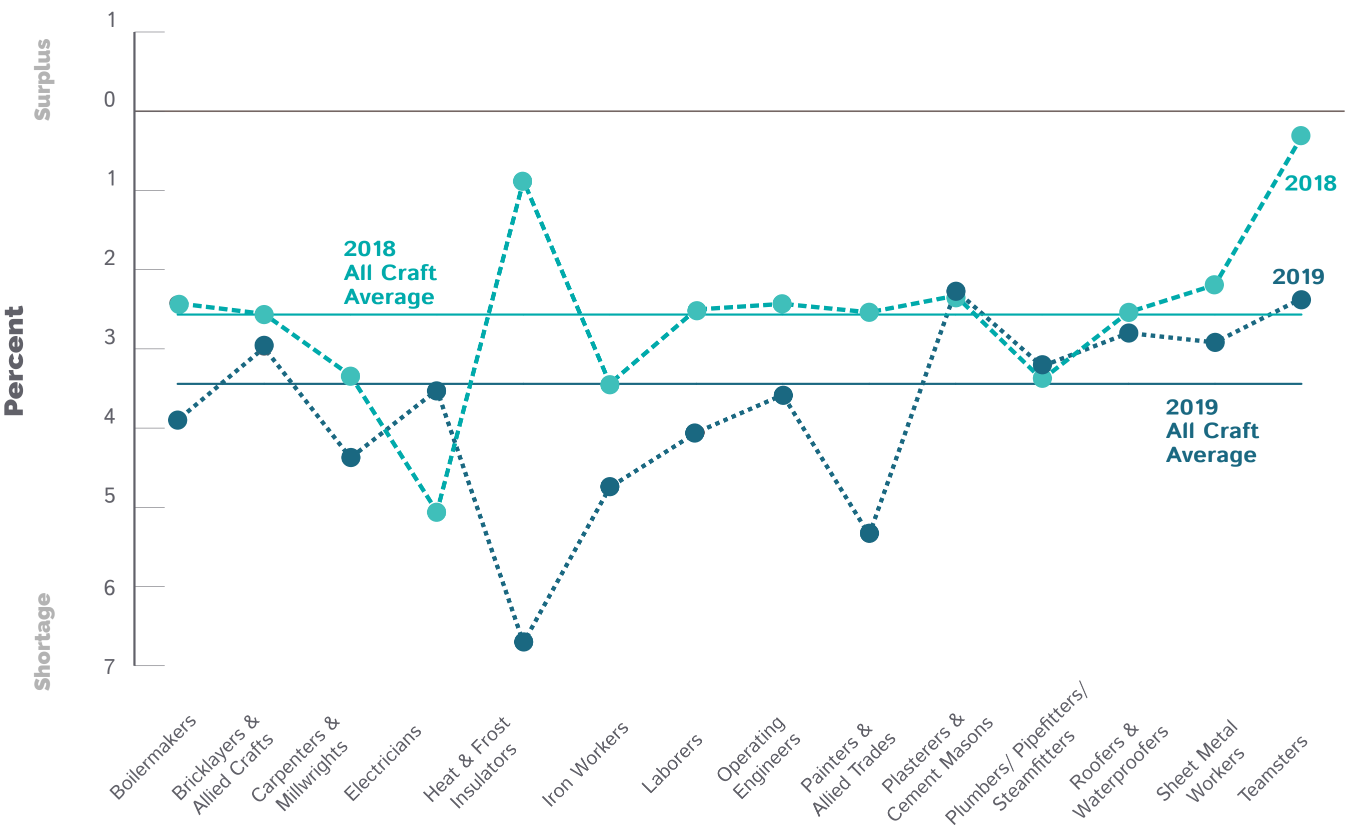


As shown in **Exhibit 4.4**, the average 2018 and 2019 ratings for projected union craft labor shortages/surpluses were often different. For example there was a 5.8% change for Heat & Frost Insulators. The overall average shortage for 2019 is 3.4% compared to 2.5% last year.

Considering the prevalence results from **Exhibit 4.3** *and the intensity results in* **Exhibit 4.4**, *the following crafts had the most substantial shortages projected for 2019: Boilermakers, Carpenters & Millwrights, Heat & Frost Insulators, Iron Workers and Painters & Allied Trades.*

Exhibit 4.4

AVERAGE PROJECTED SHORTAGE/SURPLUS RATING BY CRAFT IN 2018 & 2019



Part 3. Actual Shortage/Surplus in 2018 for Apprentices

Exhibits 4.5 and 4.6 focus on the union craft labor supply of *apprentices* last year, in 2018. These results are based on respondents' replies to questions asking them about union craft apprentice levels in their organization in 2018. The crafts are listed in descending order based on 2018 data. Data from last year's report are included as points of comparison.

Heat & Frost Insulators and Boilermakers had the most ratings expressing a shortage. There were some noticeable differences in the rank order of the craft shortages between the 2018 apprentice and the 2018 actual ratings (**Exhibit 4.1**). For example, compared to the other crafts, there was more concern for Bricklayers & Allied Trades and Painters & Allied Trades apprentice shortages than their actual staffing levels. Conversely, for Electricians and Plumbers, Pipefitters & Steamfitters, there was greater recognition for 2018 union craft labor shortages than for apprentice staffing.

Overall, a fewer percent of the responses indicated a shortage of apprentices in their organization compared to actual union craft worker levels in 2018. However, the difference was fairly small. Of the 14 crafts included in the extant study, nine had fewer responses reporting a shortage of apprentices than journeymen. Five crafts showed more concern over apprentice levels than actual 2018 union craft journeymen levels. However, for nearly every craft a greater percent of the responses indicated a shortage in 2018 than in 2017.

Exhibit 4.5

PERCENT OF RESPONSES INDICATING A SHORTAGE OR SURPLUS OF APPRENTICES IN 2017 & 2018 BY CRAFT—DESCENDING ORDER

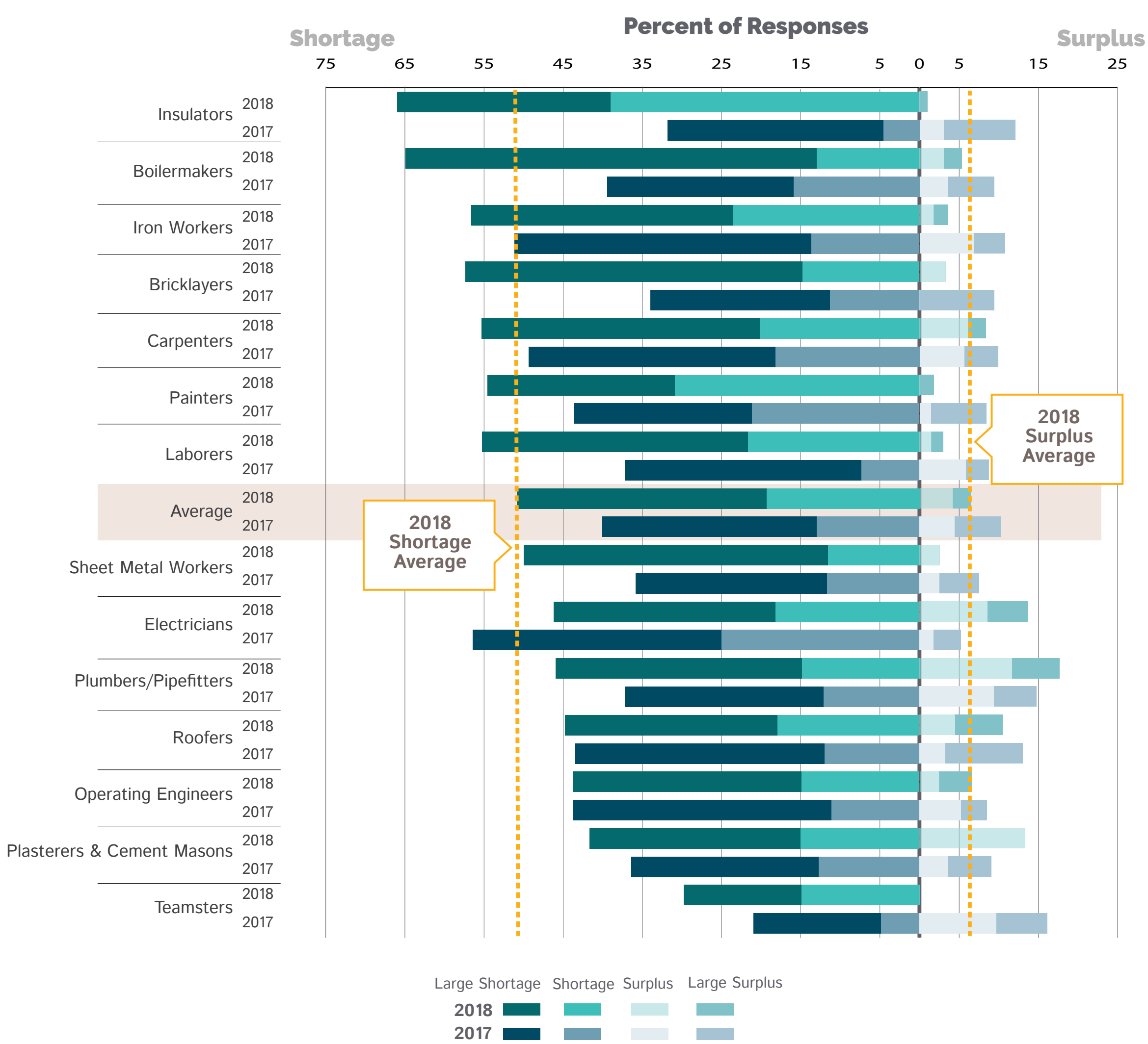
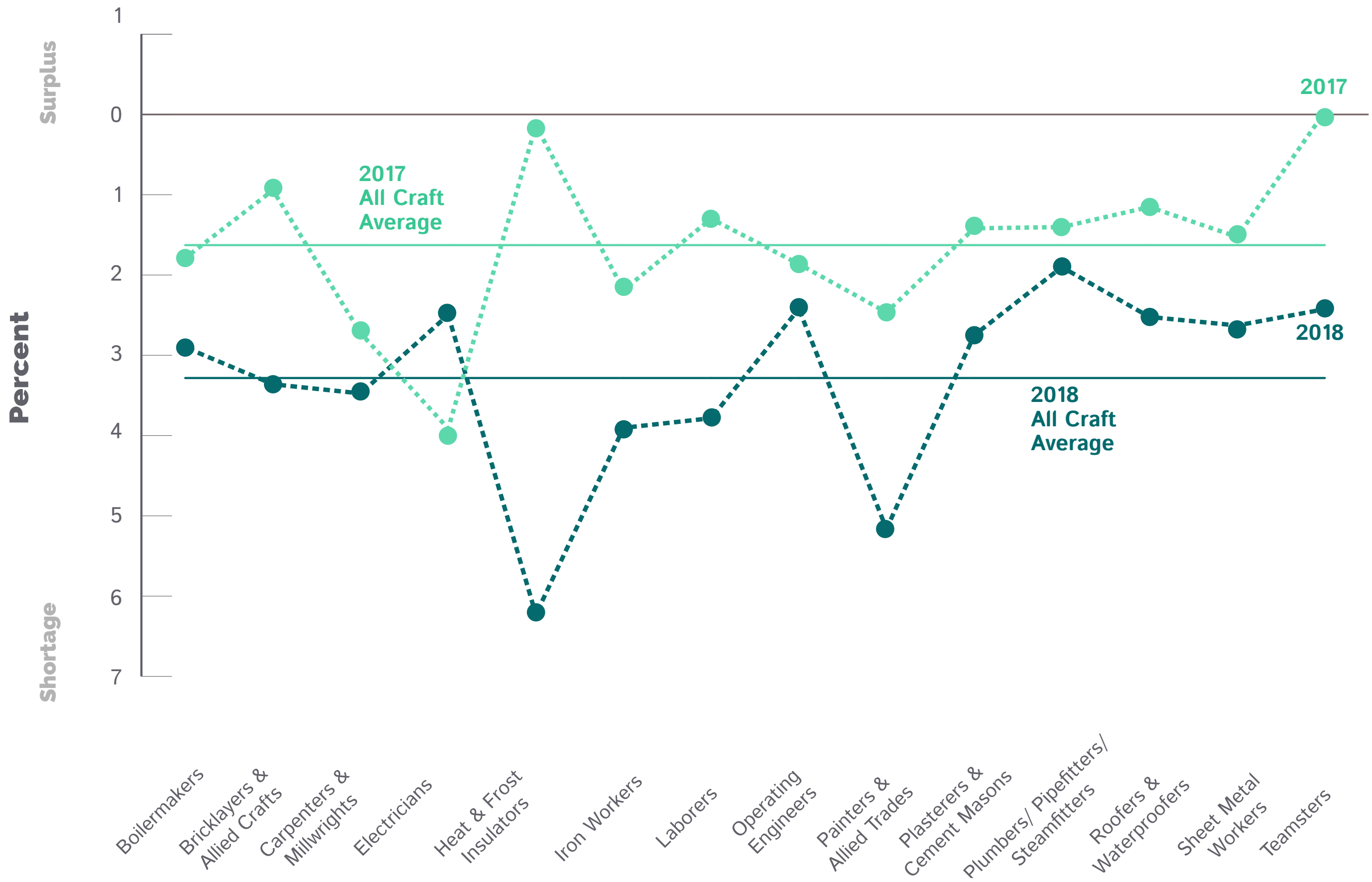


Exhibit 4.6 shows average apprentice shortage ratings. The average degree of shortage was 1.6% in 2017 and 3.3% in 2018. *Three crafts had the most significant shortage of apprentices when looking at both prevalence (**Exhibit 4.5**) and intensity (**Exhibit 4.6**): Heat & Frost Insulators, Iron Workers and Painters & Allied Trades.*

Exhibit 4.6

AVERAGE SHORTAGE/SURPLUS RATING FOR APPRENTICES BY CRAFT IN 2017 & 2018



Part 4. Difficult to Find, High Demand Skills

Participants in the study had the opportunity to list, in an open-ended manner, the skills/tasks that were most difficult to fill in their organization, and thereby in high demand. **Exhibit 4.7** lists those in descending order based on the number of times that needed skill was identified by the respondents in 2019. Results for 2018 are also shown for comparison. *The most highly demanded skill, by far, was welding.* Welding includes all types of welding (e.g., Mig, Tig, alloy, certified pipe).

Exhibit 4.7

DIFFICULT TO FIND, HIGH DEMAND SKILLS

Needed High Demand Skills	2018	2019
Welder	34%	26%
Electrician	8%	14%
Journeyman	-	7%
Plumber	5%	5%
Pipefitter/Steamfitter	6%	5%
Foreman/Supervisor	2%	5%
Equipment Operator	7%	4%
Laborer	2%	3%
Ironworker	6%	3%
HVAC Technician	5%	3%
Millwright	3%	3%
Apprentice	2%	2%
Carpenter	4%	2%
Sheet Metal Worker	-	2%
Medical Gas Fitter	-	2%
Rigger	3%	2%
Roofer	4%	2%
Control Technician	-	2%
Instrumentation	1%	2%
Insulator	1%	2%
Service Technician	5%	1%
Boilermaker	2%	1%
Bricklayer	1%	1%
Painter	-	1%
Outside Lineman	-	1%

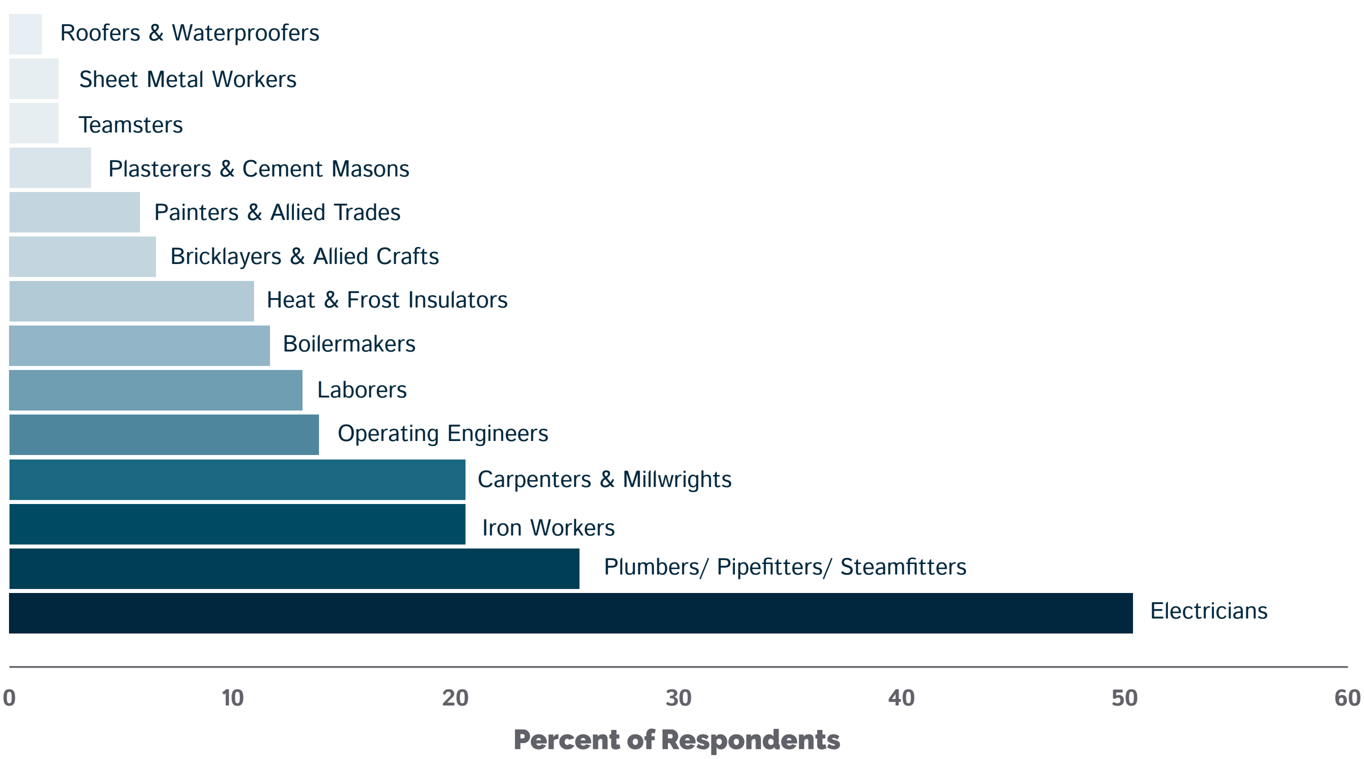
V. LABOR SHORTAGE IMPACT ON BIDS AND CONTRACTORS

New for 2019, study participants who were Contractors/ Subcontractors and Construction Managers were asked if the company they worked for did *not* bid on work because of concerns over the availability of union craft labor. Forty-four (44%) of the respondents said "yes." *In other words, close to half of the Contractors/ Subcontractors and Construction Managers said the union craft labor shortage limited the jobs for which their company tendered a bid.*

Those respondents that indicated that they did not bid on work due to union craft labor supply concerns were asked which crafts influenced this decision. Results are shown in **Exhibit 5.1**. *Electricians garnered the most responses by far, followed by Plumbers, Pipefitters, Steamfitters, Iron Workers and Carpenters & Millwrights.*

Exhibit 5.1

AVAILABILITY CONCERNS BY CRAFT LEADING TO NOT BIDDING ON WORK



Also new for 2019, respondents who were Union Representatives were asked if there was a need for additional union contractors within their local union/ organization. Overall, 92% said "yes." Thus, *there is a very strong demand within the Union/ Labor Representative role for union Contractors and Subcontractors in the construction and maintenance industry.*

More specifically, an examination of the results craft-by-craft shows that no craft had fewer than 94% of its respondents say there is a need for more union contractors. In fact, many crafts had 100% of their members participating in the study report the need for additional union contractors.

DETAILED INDIVIDUAL CRAFT RESULTS

Detailed results for each of the 14 crafts covered in this study are shown alphabetically in this section of the report. For each craft there are three areas of focus:

A. Historical Results: 2017 & 2018
B. Projections for 2019
C. Historical Results for Apprentices: 2017 & 2018

In each area of focus, two charts and a table are used to present the findings. Thus, for each craft there are nine presentations of the data, three (two bar charts and a table) for each area of focus listed above.

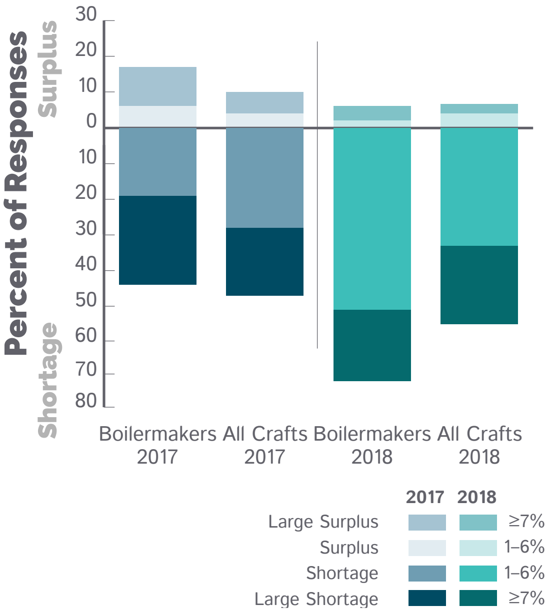
Additionally, results for all crafts combined are included in the charts and tables so that each craft can be compared to the overall average of all crafts included in this study.

I. BOILERMAKERS

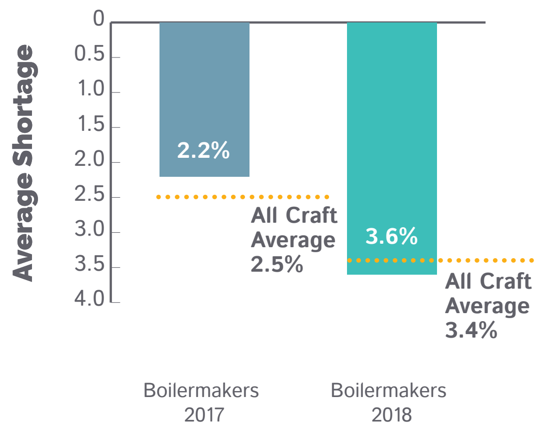
A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—BOILERMAKERS



AVERAGE SHORTAGE/SURPLUS—BOILERMAKERS



Compared to Boilermakers in 2017, the percent of respondents who reported a:

- shortage of Boilermakers in 2018 was greater (2017: 44%, 2018: 71%).
- surplus of Boilermakers in 2018 was smaller (2017: 17%, 2018: 6%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Boilermakers in 2018 was greater (Boilermakers: 71%, All Crafts: 55%).
- *surplus* of Boilermakers in 2018 was slightly smaller (Boilermakers: 6%, All Crafts: 7%).

In 2017, Boilermakers had a larger surplus and smaller shortage than all crafts combined, whereas in 2018 the opposite was true.

Compared to Boilermakers in 2017,

- there was a greater average *shortage* of Boilermakers in 2018 (2017: 2.2%, 2018: 3.6%).

Compared to all crafts combined in 2018,

- there was a slightly greater average *shortage* of Boilermakers in 2018 (Boilermakers: 3.6%, All Crafts: 3.4%).

Boilermakers went from having a smaller shortage than all crafts in 2017 to having a larger shortage in 2018.

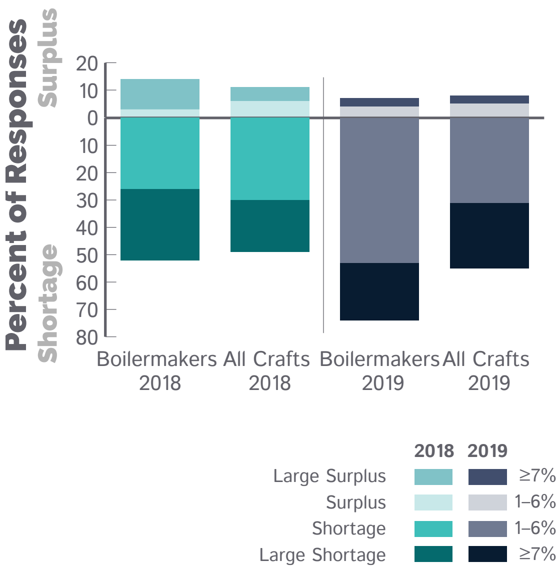
	2017		2018	
	Boilermakers	**All Crafts**	**Boilermakers**	**All Crafts**
Average	-2.2%	-2.5%	-3.6%	-3.4%
Surplus	6%	5%	2%	4%
Large Surplus	11%	5%	4%	3%
Shortage	19%	28%	51%	33%
Large Shortage	25%	19%	20%	22%

I. BOILERMAKERS (continued)

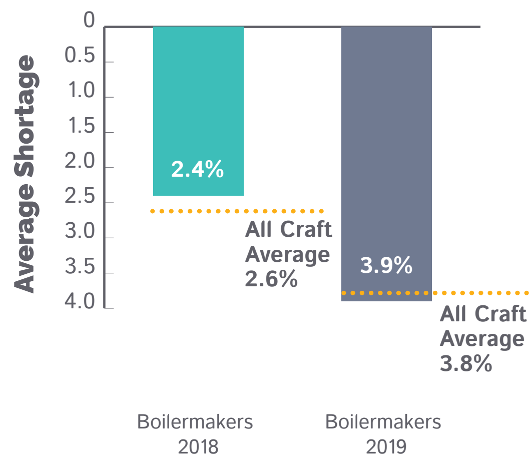
B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES PROJECTING A SHORTAGE/SURPLUS—BOILERMAKERS



AVERAGE SHORTAGE/SURPLUS PROJECTIONS—BOILERMAKERS



Compared to Boilermakers in 2018, the percent of respondents who projected a:

- *shortage* of Boilermakers in 2019 was greater (2018: 52%, 2019: 74%).
- *surplus* of Boilermakers in 2019 was smaller (2018: 14%, 2019: 7%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Boilermakers in 2019 was greater (Boilermakers: 74%, All Crafts: 55%).
- *surplus* of Boilermakers in 2019 was slightly smaller (Boilermakers: 7%, All Crafts: 8%).

Boilermakers projected a larger surplus than the all craft average in 2018, but projected a slightly smaller surplus than all crafts combined in 2019.

Compared to Boilermakers in 2018,

- there was a greater projected average *shortage* of Boilermakers in 2019 (2018: 2.4%, 2019: 3.9%).

Compared to all crafts combined in 2019,

- there was a slightly greater projected average *shortage* of Boilermakers in 2019 (Boilermakers: 3.9%, All Crafts: 3.8%).

Boilermakers went from projecting a smaller shortage than all crafts in 2018 to projecting a larger shortage in 2019.

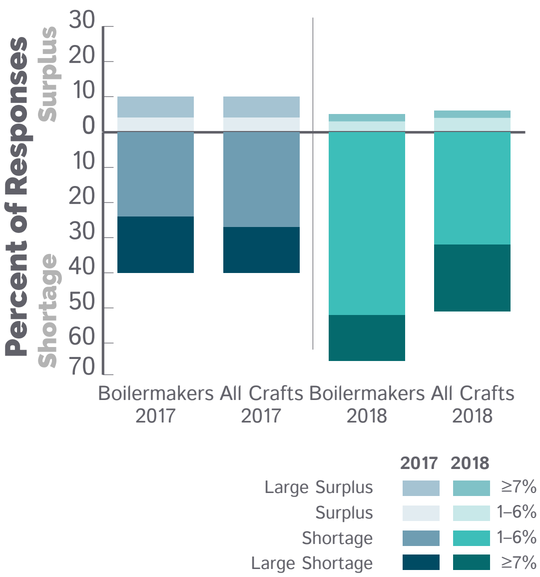
	2018		2019	
	Boilermakers	**All Crafts**	**Boilermakers**	**All Crafts**
Average	-2.4%	-2.6%	-3.9%	-3.8%
Surplus	3%	6%	4%	5%
Large Surplus	11%	5%	3%	3%
Shortage	26%	30%	53%	31%
Large Shortage	26%	19%	21%	24%

I. BOILERMAKERS (continued)

C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—BOILERMAKERS



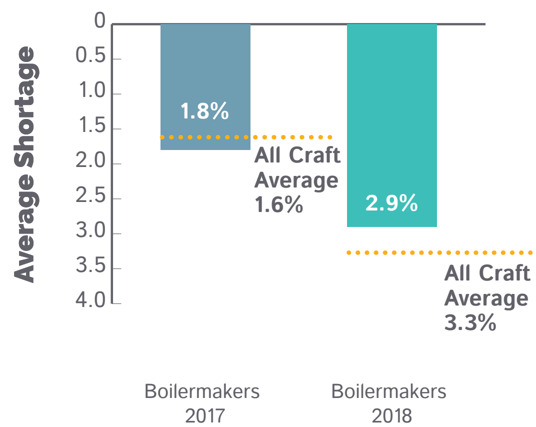
Compared to Boilermaker apprentices in 2017, the percent of respondents who reported a:

- *shortage* of Boilermaker apprentices in 2018 was greater (2017: 40%, 2018: 65%).
- *surplus* of Boilermaker apprentices in 2018 was smaller (2017: 10%, 2018: 5%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Boilermaker apprentices in 2018 was greater (Boilermaker apprentices: 65%, All Crafts: 51%).
- *surplus* of Boilermaker apprentices in 2018 was slightly smaller (Boilermaker apprentices: 5%, All Crafts: 6%).

AVERAGE SHORTAGE/SURPLUS APPRENTICES—BOILERMAKERS



Compared to Boilermaker apprentices in 2017,

- there was a greater average *shortage* of Boilermaker apprentices in 2018 (2017: 1.8%, 2018: 2.9%).

Compared to all crafts combined in 2018,

- there was a smaller average *shortage* of Boilermaker apprentices in 2018 (Boilermaker apprentices: 2.9%, All Crafts: 3.3%).

The average shortage for Boilermaker apprentices was larger in 2018 than 2017, but is now smaller than the all craft average, which was not the case in 2017.

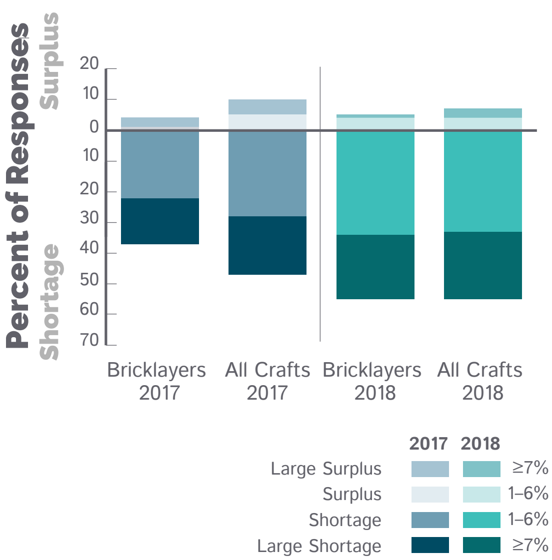
	2017		2018	
	Boilermakers	**All Crafts**	**Boilermakers**	**All Crafts**
Average	-1.8%	-1.6%	-2.9%	-3.3%
Surplus	4%	4%	3%	4%
Large Surplus	6%	6%	2%	2%
Shortage	24%	27%	52%	32%
Large Shortage	16%	13%	13%	19%

II. BRICKLAYERS & ALLIED CRAFTS

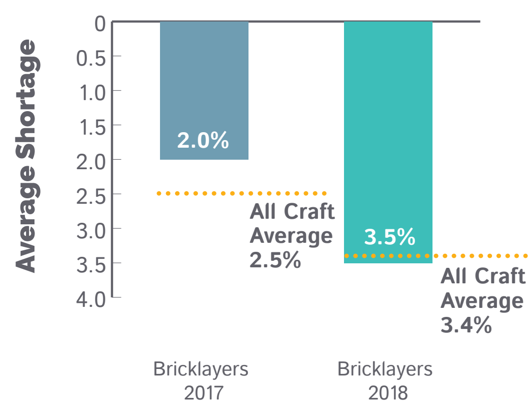
A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/ SURPLUS—BRICKLAYERS & ALLIED CRAFTS



AVERAGE SHORTAGE/SURPLUS— BRICKLAYERS & ALLIED CRAFTS



Compared to Bricklayers & Allied Crafts in 2017, the percent of respondents who reported a:

- *shortage* of Bricklayers & Allied Crafts in 2018 was greater (2017: 37%, 2018: 55%).
- *surplus* of Bricklayers & Allied Crafts in 2018 was slightly greater (2017: 4%, 2018: 5%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Bricklayers & Allied Crafts in 2018 was the same (55%).
- *surplus* of Bricklayers & Allied Crafts in 2018 was smaller (Bricklayers & Allied Crafts: 5%, All Crafts: 7%).

While Bricklayers & Allied Crafts reported a larger shortage in 2018, they are still on par with all crafts combined.

Compared to Bricklayers & Allied Crafts in 2017,

- there was a greater average *shortage* of Bricklayers & Allied Crafts in 2018 (2017: 2.0%, 2018: 3.5%).

Compared to all crafts combined in 2018,

- there was a slightly greater average *shortage* of Bricklayers & Allied Crafts in 2018 (Bricklayers & Allied Crafts: 3.5%, All Crafts: 3.4%).

Bricklayers & Allied Crafts went from having a smaller shortage than all crafts combined in 2017 to having a slightly larger shortage than the all craft average in 2018.

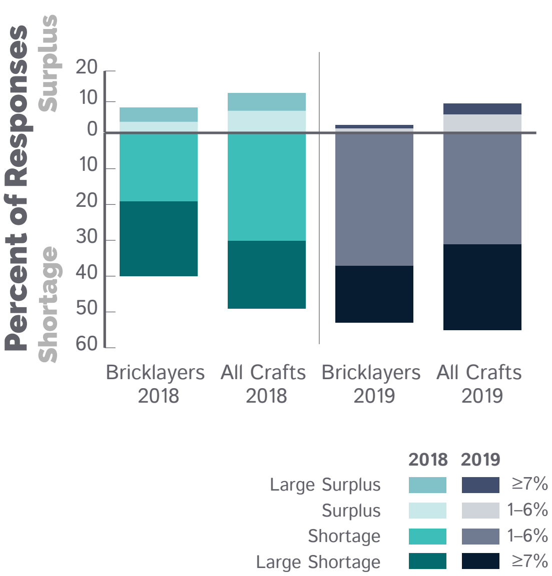
	2017		2018	
	Bricklayers & Allied Crafts	**All Crafts**	**Bricklayers & Allied Crafts**	**All Crafts**
Average	-2.0%	-2.5%	-3.5%	-3.4%
Surplus	1%	5%	4%	4%
Large Surplus	3%	5%	1%	3%
Shortage	22%	28%	34%	33%
Large Shortage	15%	19%	21%	22%

II. BRICKLAYERS & ALLIED CRAFTS (continued)

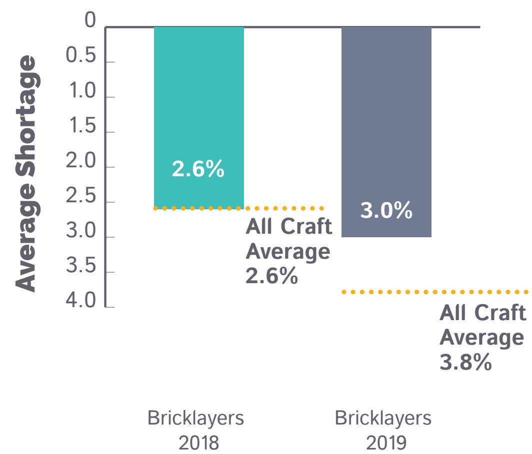
B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES PROJECTING A SHORTAGE/SURPLUS—BRICKLAYERS & ALLIED CRAFTS



AVERAGE SHORTAGE/SURPLUS PROJECTIONS—BRICKLAYERS & ALLIED CRAFTS



Compared to Bricklayers & Allied Crafts in 2018, the percent of respondents who projected a:

- *shortage* of Bricklayers & Allied Crafts in 2019 was greater (2018: 40%, 2019: 53%).
- *surplus* of Bricklayers & Allied Crafts in 2019 was smaller (2018: 7%, 2019: 2%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Bricklayers & Allied Crafts in 2019 was slightly smaller (Bricklayers & Allied Crafts: 53%, All Crafts: 55%).
- *surplus* of Bricklayers & Allied Crafts in 2019 was smaller (Bricklayers & Allied Crafts: 2%, All Crafts: 8%).

While Bricklayers & Allied Crafts project a larger shortage in 2019 than 2018, they still project slightly smaller than all crafts combined.

Compared to Bricklayers & Allied Crafts in 2018,

- there was a greater projected average *shortage* of Bricklayers & Allied Crafts in 2019 (2018: 2.6%, 2019: 3.0%).

Compared to all crafts combined in 2019,

- there was a smaller projected average *shortage* of Bricklayers & Allied Crafts in 2019 (Bricklayers & Allied Crafts: 3.0%, All Crafts: 3.8%).

Bricklayers & Allied Crafts project a larger shortage in 2019 than 2018, but now project a smaller shortage than the all craft average in 2019, which was not the case in 2018.

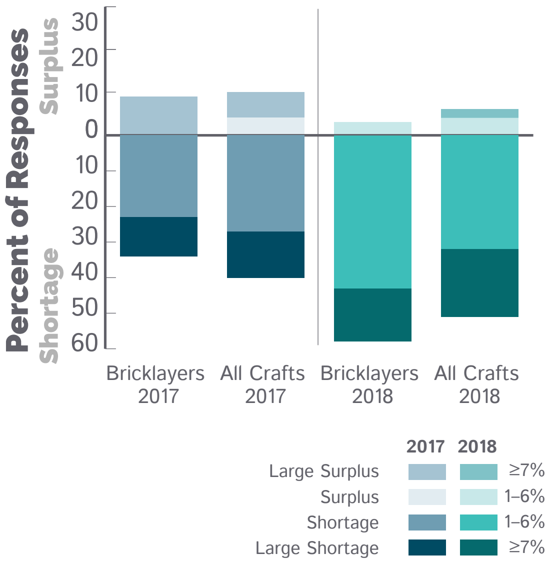
	2018		2019	
	Bricklayers & Allied Crafts	All Crafts	Bricklayers & Allied Crafts	All Crafts
Average	-2.6%	-2.6%	-3.0%	-3.8%
Surplus	3%	6%	1%	5%
Large Surplus	4%	5%	1%	3%
Shortage	19%	30%	37%	31%
Large Shortage	21%	19%	16%	24%

II. BRICKLAYERS & ALLIED CRAFTS (continued)

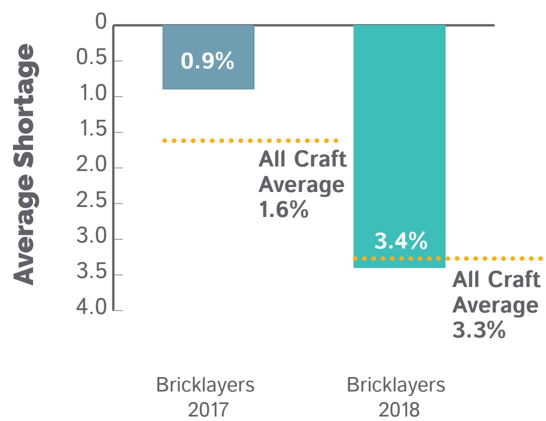
C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—BRICKLAYERS & ALLIED CRAFTS



AVERAGE SHORTAGE/SURPLUS FOR APPRENTICES—BRICKLAYERS & ALLIED CRAFTS



Compared to Bricklayer & Allied Craft apprentices in 2017, the percent of respondents who reported a:

- *shortage* of Bricklayer & Allied Craft apprentices in 2018 was greater (2017: 34%, 2018: 58%).
- *surplus* of Bricklayer & Allied Craft apprentices in 2018 was smaller (2017: 9%, 2018: 3%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Bricklayer & Allied Craft apprentices in 2018 was greater (Bricklayer & Allied Craft apprentices: 58%, All Crafts: 51%).
- *surplus* of Bricklayer & Allied Craft apprentices in 2018 was smaller (Bricklayer & Allied Craft apprentices: 3%, All Crafts: 6%).

Compared to Bricklayer & Allied Craft apprentices in 2017,

- there was a greater average *shortage* of Bricklayer & Allied Craft apprentices in 2018 (2017: 0.9%, 2018: 3.4%).

Compared to all crafts combined in 2018,

- there was a slightly greater average *shortage* of Bricklayer & Allied Craft apprentices in 2018 (Bricklayer & Allied Craft apprentices: 3.4%, All Crafts: 3.3%).

Bricklayer & Allied Craft apprentices went from having a smaller shortage than all crafts combined in 2017 to having a slightly larger shortage in 2018.

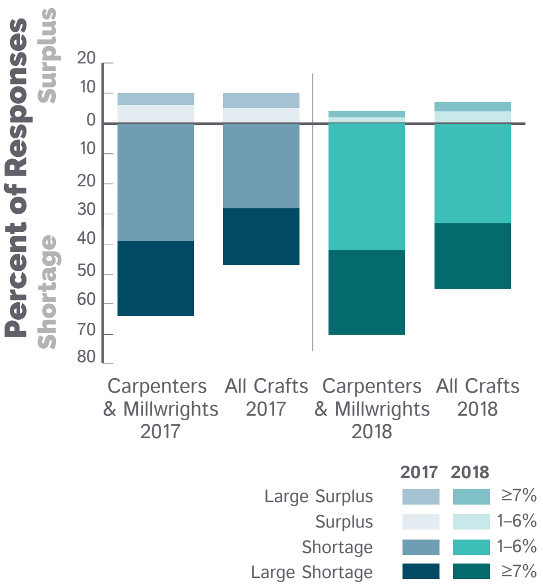
	2017		2018	
	Bricklayers & Allied Crafts	**All Crafts**	**Bricklayers & Allied Crafts**	**All Crafts**
Average	-0.9%	-1.6%	-3.4%	-3.3%
Surplus	0%	4%	3%	4%
Large Surplus	9%	6%	0%	2%
Shortage	23%	27%	43%	32%
Large Shortage	11%	13%	15%	19%

III. CARPENTERS & MILLWRIGHTS

A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—CARPENTERS & MILLWRIGHTS



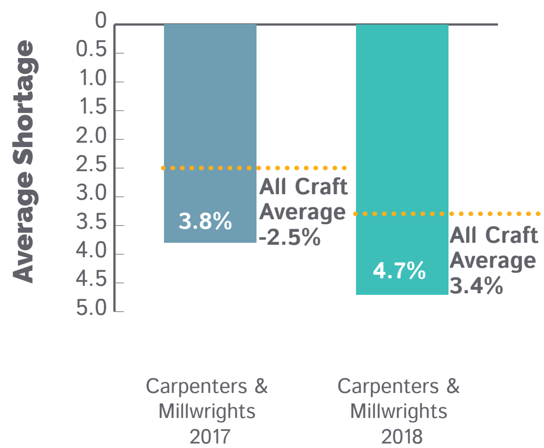
Compared to Carpenters & Millwrights in 2017, the percent of respondents who reported a:

- *shortage* of Carpenters & Millwrights in 2018 was greater (2017: 64%, 2018: 70%).
- *surplus* of Carpenters & Millwrights in 2018 was smaller (2017: 10%, 2018: 4%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Carpenters & Millwrights in 2018 was greater (Carpenters & Millwrights: 70%, All Crafts: 55%).
- *surplus* of Carpenters & Millwrights in 2018 was smaller (Carpenters & Millwrights: 4%, All Crafts: 7%)

AVERAGE SHORTAGE/SURPLUS—CARPENTERS & MILLWRIGHTS



Compared to Carpenters & Millwrights in 2017,

- there was a greater average *shortage* of Carpenters & Millwrights in 2018 (2017: 3.8%, 2018: 4.7%).

Compared to all crafts combined in 2018,

- there was a greater average *shortage* of Carpenters & Millwrights in 2018 (Carpenters & Millwrights: 4.7%, All Crafts: 3.4%).

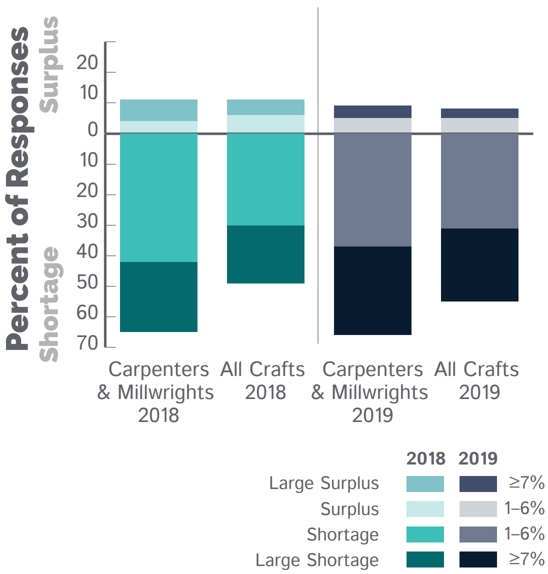
	2017		2018	
	Carpenters & Millwrights	**All Crafts**	**Carpenters & Millwrights**	**All Crafts**
Average	-3.8%	-2.5%	-4.7%	-3.4%
Surplus	6%	5%	2%	4%
Large Surplus	4%	5%	2%	3%
Shortage	39%	28%	42%	33%
Large Shortage	25%	19%	28%	22%

III. CARPENTERS & MILLWRIGHTS (continued)

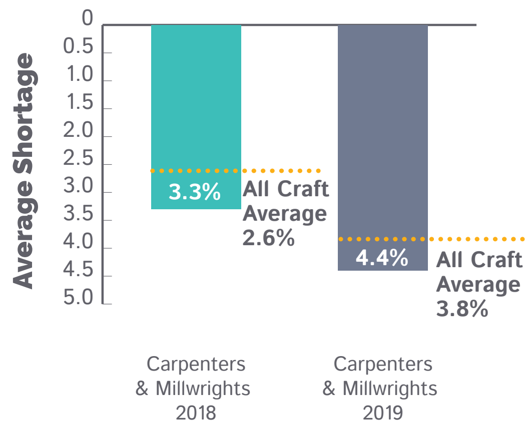
B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES PROJECTING A SHORTAGE/SURPLUS—CARPENTERS & MILLWRIGHTS



AVERAGE SHORTAGE/SURPLUS PROJECTIONS—CARPENTERS & MILLWRIGHTS



Compared to Carpenters & Millwrights in 2018, the percent of respondents who projected a:

- *shortage* of Carpenters & Millwrights in 2019 was slightly greater (2018: 65%, 2019: 66%).
- *surplus* of Carpenters & Millwrights in 2019 was slightly smaller (2018: 11%, 2019: 9%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Carpenters & Millwrights in 2019 was greater (Carpenters & Millwrights: 66%, All Crafts: 55%).
- *surplus* of Carpenters & Millwrights in 2019 was slightly greater (Carpenters & Millwrights: 9%, All Crafts: 8%).

Although the projected surplus of Carpenters & Millwrights fell from 2018 to 2019, it is projected slightly higher than all crafts combined in 2019.

Compared to Carpenters & Millwrights in 2018,

- there was a greater projected average *shortage* of Carpenters & Millwrights in 2019 (2018: 3.3%, 2019: 4.4%).

Compared to all crafts combined in 2019,

- there was a greater projected average *shortage* of Carpenters & Millwrights in 2019 (Carpenters & Millwrights: 4.4%, All Crafts: 3.8%).

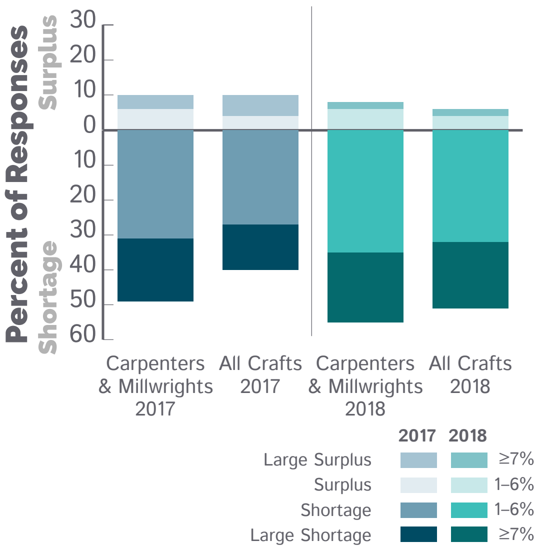
	2018		2019	
	Carpenters & Millwrights	**All Crafts**	**Carpenters & Millwrights**	**All Crafts**
Average	-3.3%	-2.6%	-4.4%	-3.8%
Surplus	4%	6%	5%	5%
Large Surplus	7%	5%	4%	3%
Shortage	42%	30%	37%	31%
Large Shortage	23%	19%	29%	24%

III. CARPENTERS & MILLWRIGHTS (continued)

C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—CARPENTERS & MILLWRIGHTS



Compared to Carpenter & Millwright apprentices in 2017, the percent of respondents who reported a:

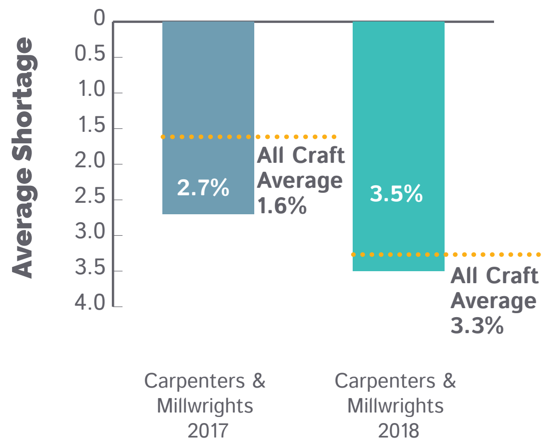
- *shortage* of Carpenter & Millwright apprentices in 2018 was greater (2017: 49%, 2018: 55%).
- *surplus* of Carpenter & Millwright apprentices in 2018 was slightly smaller (2017: 10%, 2018: 8%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Carpenter & Millwright apprentices in 2018 was greater (Carpenter & Millwright apprentices: 55%, All Crafts: 51%).
- *surplus* of Carpenter & Millwright apprentices in 2018 was slightly greater (Carpenter & Millwright apprentices: 8%, All Crafts: 6%).

Although the reported surplus of Carpenter & Millwright apprentices fell from 2017 to 2018, it was greater than all crafts combined in 2018.

AVERAGE SHORTAGE/SURPLUS FOR APPRENTICES—CARPENTERS & MILLWRIGHTS



Compared to Carpenter & Millwright apprentices in 2017,

- there was a greater average *shortage* of Carpenter & Millwright apprentices in 2018 (2017: 2.7%, 2018: 3.5%).

Compared to all crafts combined in 2018,

- there was a slightly greater average *shortage* of Carpenter & Millwright apprentices in 2018 (Carpenter & Millwright apprentices: 3.5%, All Crafts: 3.3%).

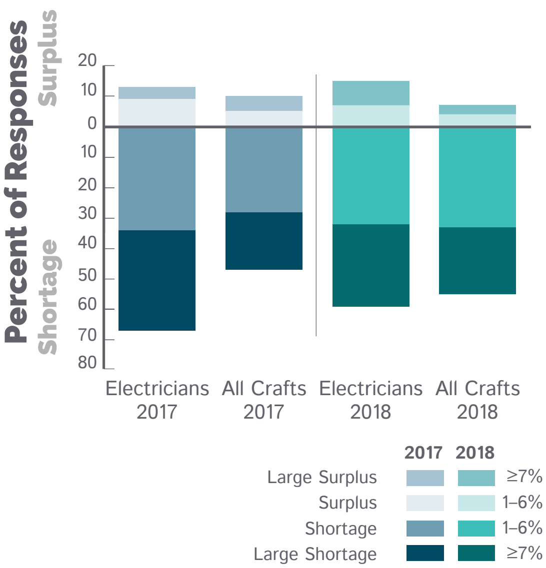
	2017		2018	
	Carpenters & Millwrights	**All Crafts**	**Carpenters & Millwrights**	**All Crafts**
Average	-2.7%	-1.6%	-3.5%	-3.3%
Surplus	6%	4%	6%	4%
Large Surplus	4%	6%	2%	2%
Shortage	31%	27%	35%	32%
Large Shortage	18%	13%	20%	19%

IV. ELECTRICIANS

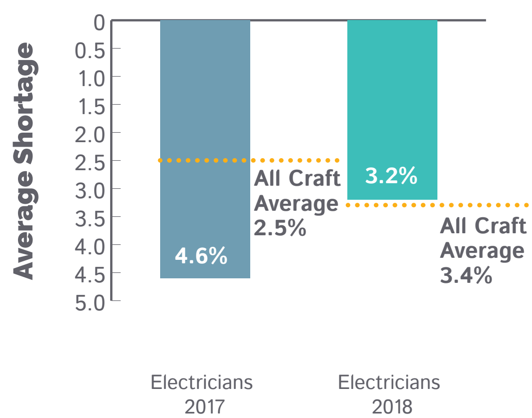
A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/ SURPLUS—ELECTRICIANS



AVERAGE SHORTAGE/SURPLUS—ELECTRICIANS



Compared to Electricians in 2017, the percent of respondents who reported a:

- *shortage* of Electricians in 2018 was smaller (2017: 67%, 2018: 59%).
- *surplus* of Electricians in 2018 was slightly greater (2017: 13%, 2018: 15%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Electricians in 2018 was greater (Electricians: 59%, All Crafts: 55%).
- *surplus* of Electricians in 2018 was greater (Electricians: 15%, All Crafts: 7%).

Electricians reported a smaller shortage in 2018 compared to 2017, but were still larger than all crafts combined for 2018.

Compared to Electricians in 2017,

- there was a smaller average *shortage* of Electricians in 2018 (2017: 4.6%, 2018: 3.2%).

Compared to all crafts combined in 2018,

- there was a slightly smaller average *shortage* of Electricians in 2018 (Electricians: 3.2%, All Crafts: 3.4%).

Electricians' average improved from a larger shortage than the all craft average in 2017 to a smaller shortage than the all craft average in 2018.

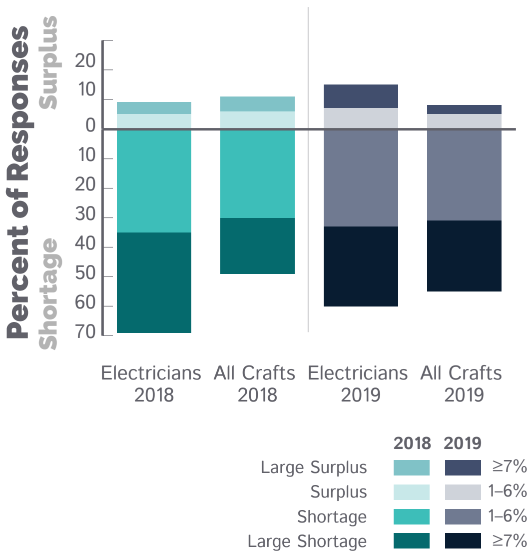
	2017		2018	
	Electricians	**All Crafts**	**Electricians**	**All Crafts**
Average	-4.6%	-2.5%	-3.2%	-3.4%
Surplus	9%	5%	7%	4%
Large Surplus	4%	5%	8%	3%
Shortage	34%	28%	32%	33%
Large Shortage	33%	19%	27%	22%

IV. ELECTRICIANS (continued)

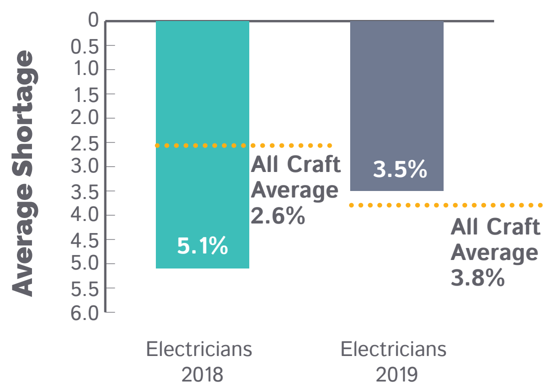
B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES PROJECTING A SHORTAGE/SURPLUS—ELECTRICIANS



AVERAGE SHORTAGE/SURPLUS PROJECTIONS—ELECTRICIANS



Compared to Electricians in 2018, the percent of respondents who projected a:

- *shortage* of Electricians in 2019 was smaller (2018: 69%, 2019: 60%).
- *surplus* of Electricians in 2019 was greater (2018: 9%, 2019: 15%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Electricians in 2019 was greater (Electricians: 60%, All Crafts: 55%).
- *surplus* of Electricians in 2019 was greater (Electricians: 15%, All Crafts: 8%).

Electricians projected a smaller shortage in 2019 compared to 2018, but were still larger than the projection for all crafts combined for 2019.

Compared to Electricians in 2018,

- there was a smaller projected average *shortage* of Electricians in 2019 (2018: 5.1%, 2019: 3.5%).

Compared to all crafts combined in 2019,

- there was a smaller projected average *shortage* of Electricians in 2019 (Electricians: 3.5%, All Crafts: 3.8%).

Electricians' projected average improved from a larger shortage than the all craft average in 2018 to a smaller shortage than the all craft average in 2019.

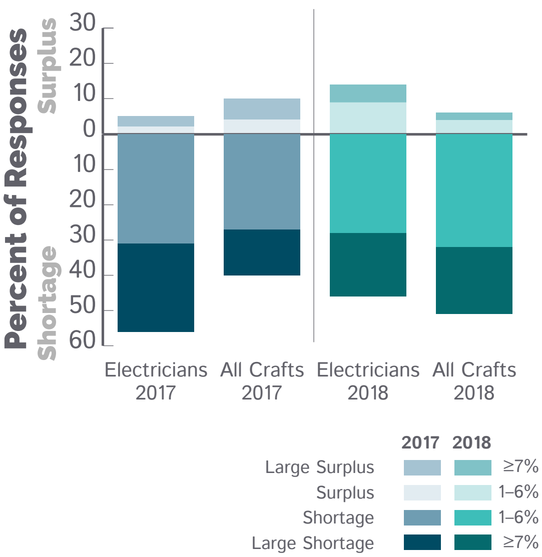
	2018		2019	
	Electricians	All Crafts	Electricians	All Crafts
Average	-5.1%	-2.6%	-3.5%	-3.8%
Surplus	5%	6%	7%	5%
Large Surplus	4%	5%	8%	3%
Shortage	35%	30%	33%	31%
Large Shortage	34%	19%	27%	24%

IV. ELECTRICIANS (continued)

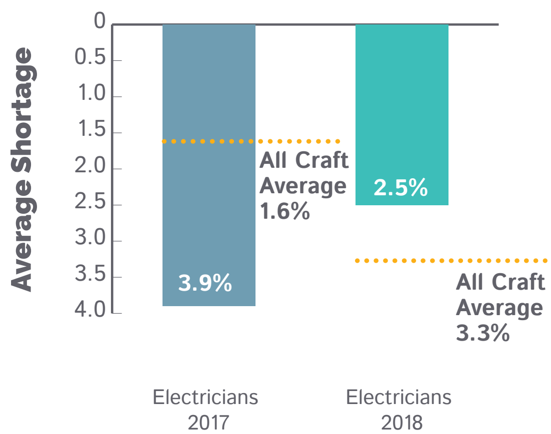
C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—ELECTRICIANS



AVERAGE SHORTAGE/SURPLUS FOR APPRENTICES—ELECTRICIANS



Compared to Electrician apprentices in 2017, the percent of respondents who reported a:

- *shortage* of Electrician apprentices in 2018 was smaller (2017: 56%, 2018: 46%).
- *surplus* of Electrician apprentices in 2018 was greater (2017: 5%, 2018: 14%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Electrician apprentices in 2018 was smaller (Electrician apprentices: 46%, All Crafts: 51%).
- *surplus* of Electrician apprentices in 2018 was greater (Electrician apprentices: 14%, All Crafts: 6%).

Compared to Electrician apprentices in 2017,

- there was a smaller average *shortage* of Electrician apprentices in 2018 (2017: 3.9%, 2018: 2.5%).

Compared to all crafts combined in 2018,

- there was a smaller average *shortage* of Electrician apprentices in 2018 (Electrician apprentices: 2.5%, All Crafts: 3.3%).

Electrician apprentices' average improved from a larger shortage than the all craft average in 2017 to a smaller shortage than the all craft average in 2018.

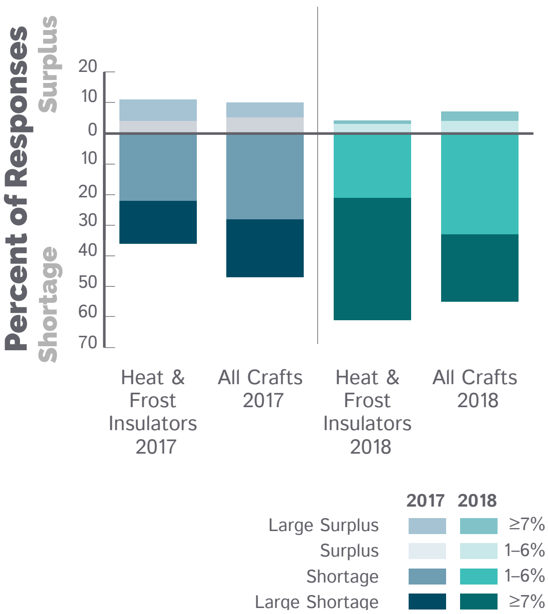
	2017		2018	
	Electricians	**All Crafts**	**Electricians**	**All Crafts**
Average	-3.9%	-1.6%	-2.5%	-3.3%
Surplus	2%	4%	9%	4%
Large Surplus	3%	6%	5%	2%
Shortage	31%	27%	28%	32%
Large Shortage	25%	13%	18%	19%

V. HEAT & FROST INSULATORS

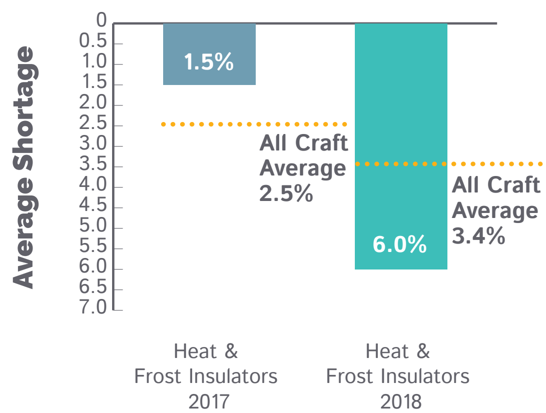
A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/ SURPLUS—HEAT & FROST INSULATORS



AVERAGE SHORTAGE/SURPLUS—HEAT & FROST INSULATORS



Compared to Heat & Frost Insulators in 2017, the percent of respondents who reported a:

- *shortage* of Heat & Frost Insulators in 2018 was greater (2017: 36%, 2018: 61%).
- *surplus* of Heat & Frost Insulators in 2018 was smaller (2017: 11%, 2018: 4%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Heat & Frost Insulators in 2018 was greater (Heat & Frost Insulators: 61%, All Crafts: 55%).
- *surplus* of Heat & Frost Insulators in 2018 was smaller (Heat & Frost Insulators: 4%, All Crafts: 7%).

Compared to Heat & Frost Insulators in 2017,

- there was a greater average *shortage* of Heat & Frost Insulators in 2018 (2017: 1.5%, 2018: 6.0%).

Compared to all crafts combined in 2018,

- there was a greater average *shortage* of Heat & Frost Insulators in 2018 (Heat & Frost Insulators: 6.0%, All Crafts: 3.4%).

Heat & Frost Insulators went from having a smaller shortage than the all craft average in 2017 to having a larger shortage in 2018.

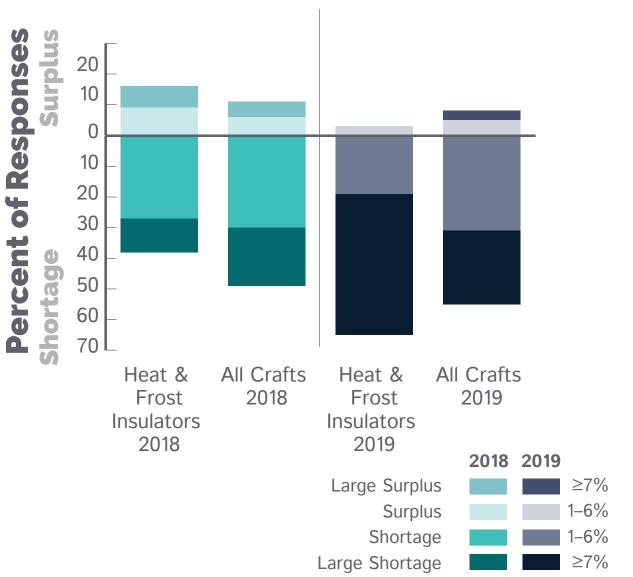
	2017		2018	
	Heat & Frost Insulators	All Crafts	Heat & Frost Insulators	All Crafts
Average	-1.5%	-2.5%	-6.0%	-3.4%
Surplus	4%	5%	3%	4%
Large Surplus	7%	5%	1%	3%
Shortage	22%	28%	21%	33%
Large Shortage	14%	19%	40%	22%

V. HEAT & FROST INSULATORS (continued)

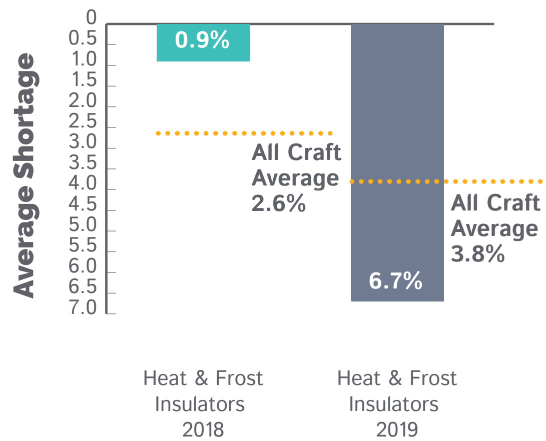
B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES PROJECTING A SHORTAGE/SURPLUS—HEAT & FROST INSULATORS



AVERAGE SHORTAGE/SURPLUS PROJECTIONS—HEAT & FROST INSULATORS



Compared to Heat & Frost Insulators in 2018, the percent of respondents who projected a:

- *shortage* of Heat & Frost Insulators in 2019 was greater (2018: 38%, 2019: 65%).
- *surplus* of Heat & Frost Insulators in 2019 was smaller (2018: 16%, 2019: 3%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Heat & Frost Insulators in 2019 was greater (Heat & Frost Insulators: 65%, All Crafts: 55%).
- *surplus* of Heat & Frost Insulators in 2019 was smaller (Heat & Frost Insulators: 3%, All Crafts: 8%).

Compared to Heat & Frost Insulators in 2018,

- there was a greater projected average *shortage* of Heat & Frost Insulators in 2019 (2018: 0.9%, 2019: 6.7%).

Compared to all crafts combined in 2019,

- there was a greater projected average *shortage* of Heat & Frost Insulators in 2019 (Heat & Frost Insulators: 6.7%, All Crafts: 3.8%).

The projected shortage for Heat & Frost Insulators was larger in 2019 than 2018, resulting in their surpassing of the projection of all craft average in 2019.

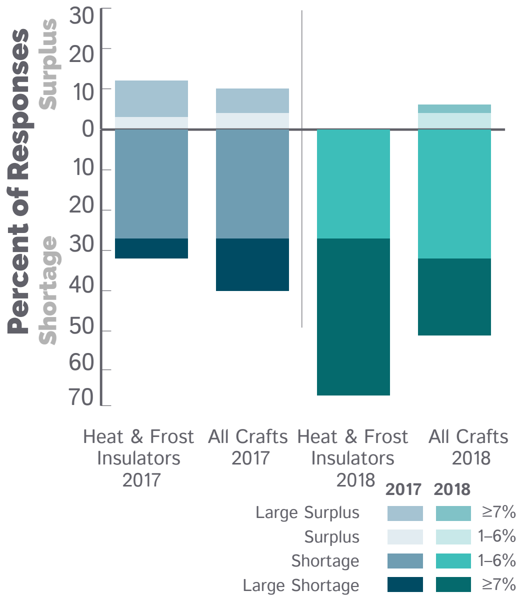
	2018		2019	
	Heat & Frost Insulators	**All Crafts**	**Heat & Frost Insulators**	**All Crafts**
Average	-0.9%	-2.6%	-6.7%	-3.8%
Surplus	9%	6%	3%	5%
Large Surplus	7%	5%	0%	3%
Shortage	27%	30%	19%	31%
Large Shortage	11%	19%	46%	24%

V. HEAT & FROST INSULATORS (continued)

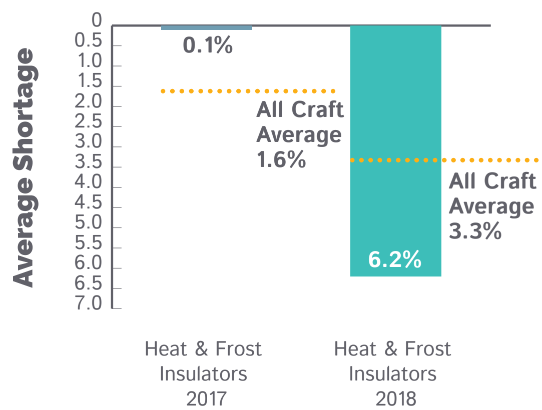
C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—HEAT & FROST INSULATORS



AVERAGE SHORTAGE/SURPLUS FOR APPRENTICES—HEAT & FROST INSULATORS



Compared to Heat & Frost Insulator apprentices in 2017, the percent of respondents who reported a:

- *shortage* of Heat & Frost Insulator apprentices in 2018 was greater (2017: 32%, 2018: 66%).
- *surplus* of Heat & Frost Insulator apprentices in 2018 was smaller (2017: 12%, 2018: 0%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Heat & Frost Insulator apprentices in 2018 was greater (Heat & Frost Insulator apprentices: 66%, All Crafts: 51%).
- *surplus* of Heat & Frost Insulator apprentices in 2018 was smaller (Heat & Frost Insulator apprentices: 0%, All Crafts: 6%).

Compared to Heat & Frost Insulator apprentices in 2017,

- there was a greater average *shortage* of Heat & Frost Insulator apprentices in 2018 (2017: 0.1%, 2018: 6.2%).

Compared to all crafts combined in 2018,

- there was a greater average *shortage* of Heat & Frost Insulator apprentices in 2018 (Heat & Frost Insulator apprentices: 6.2%, All Crafts: 3.3%).

The average shortage for Heat & Frost Insulator apprentices was larger in 2018 than 2017, resulting in their surpassing of the all craft average in 2018.

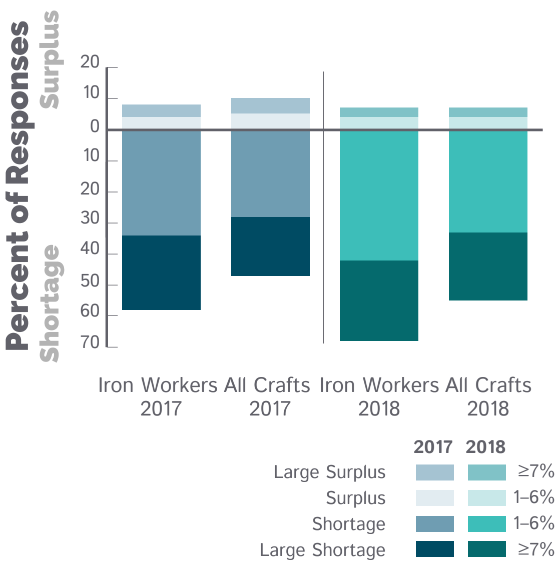
	2017		2018	
	Heat & Frost Insulators	All Crafts	Heat & Frost Insulators	All Crafts
Average	-0.1%	-1.6%	-6.2%	-3.3%
Surplus	3%	4%	0%	4%
Large Surplus	9%	6%	1%	2%
Shortage	27%	27%	27%	32%
Large Shortage	5%	13%	39%	19%

VI. IRON WORKERS

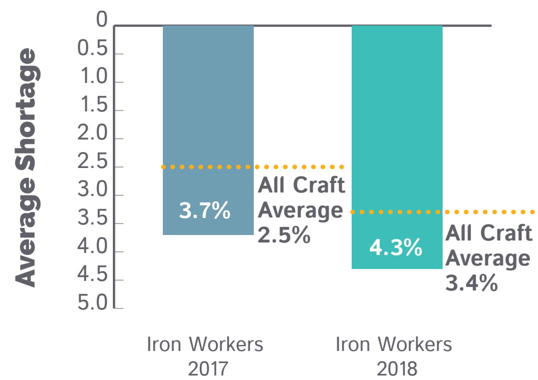
A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/ SURPLUS—IRON WORKERS



AVERAGE SHORTAGE/SURPLUS—IRON WORKERS



Compared to Iron Workers in 2017, the percent of respondents who reported a:

- *shortage* of Iron Workers in 2018 was greater (2017: 58%, 2018: 68%).
- *surplus* of Iron Workers in 2018 was slightly smaller (2017: 8%, 2018: 7%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Iron Workers in 2018 was greater (Iron Workers: 68%, All Crafts: 55%).
- *surplus* of Iron Workers in 2018 was the same (7%).

Compared to Iron Workers in 2017,

- there was a greater average *shortage* of Iron Workers in 2018 (2017: 3.7%, 2018: 4.3%).

Compared to all crafts combined in 2018,

- there was a greater average *shortage* of Iron Workers in 2018 (Iron Workers: 4.3%, All Crafts: 3.4%).

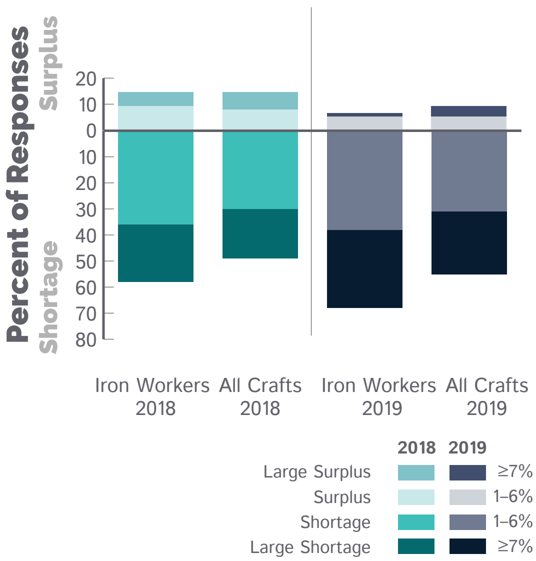
	2017		2018	
	Iron Workers	**All Crafts**	**Iron Workers**	**All Crafts**
Average	-3.7%	-2.5%	-4.3%	-3.4%
Surplus	4%	5%	4%	4%
Large Surplus	4%	5%	3%	3%
Shortage	34%	28%	42%	33%
Large Shortage	24%	19%	26%	22%

VI. IRON WORKERS (continued)

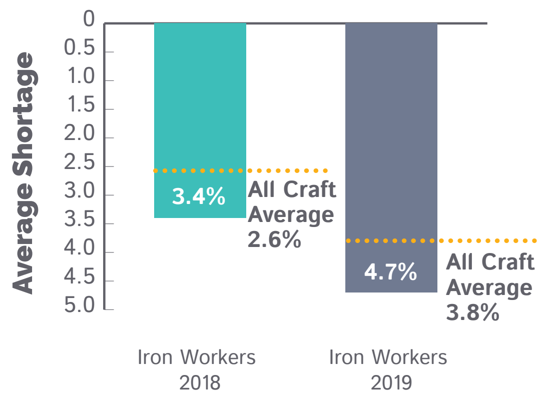
B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES PROJECTING A SHORTAGE/SURPLUS—IRON WORKERS



AVERAGE SHORTAGE/SURPLUS PROJECTIONS—IRON WORKERS



Compared to Iron Workers in 2018, the percent of respondents who projected a:

- *shortage* of Iron Workers in 2019 was greater (2018: 58%, 2019: 68%).
- *surplus* of Iron Workers in 2019 was smaller (2018: 11%, 2019: 5%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Iron Workers in 2019 was greater (Iron Workers: 68%, All Crafts: 55%).
- *surplus* of Iron Workers in 2019 was smaller (Iron Workers: 5%, All Crafts: 8%).

Compared to Iron Workers in 2018,

- there was a greater projected average *shortage* of Iron Workers in 2019 (2018: 3.4%, 2019: 4.7%).

Compared to all crafts combined in 2019,

- there was a greater projected average *shortage* of Iron Workers in 2019 (Iron Workers: 4.7%, All Crafts: 3.8%).

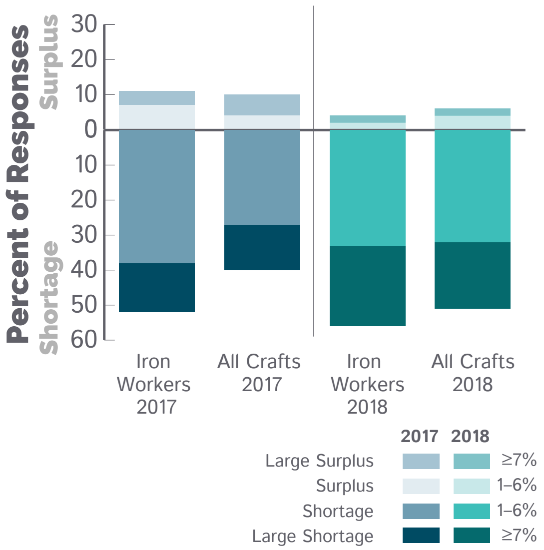
	2018		2019	
	Iron Workers	**All Crafts**	**Iron Workers**	**All Crafts**
Average	-3.4%	-2.6%	-4.7%	-3.8%
Surplus	7%	6%	4%	5%
Large Surplus	4%	5%	1%	3%
Shortage	36%	30%	38%	31%
Large Shortage	22%	19%	30%	24%

VI. IRON WORKERS (continued)

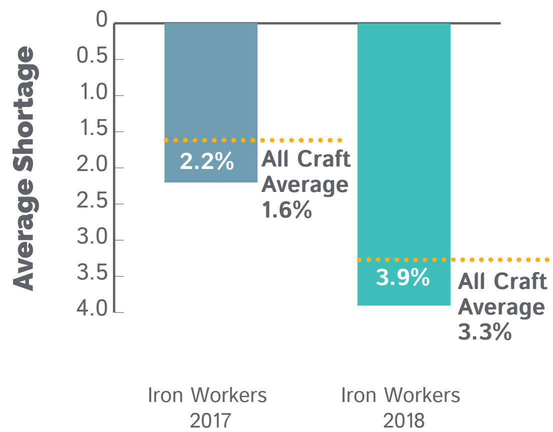
C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—IRON WORKERS



AVERAGE SHORTAGE/SURPLUS FOR APPRENTICES—IRON WORKERS



Compared to Iron Worker apprentices in 2017, the percent of respondents who reported a:

- *shortage* of Iron Worker apprentices in 2018 was greater (2017: 52%, 2018: 56%).
- *surplus* of Iron Worker apprentices in 2018 was smaller (2017: 11%, 2018: 4%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Iron Worker apprentices in 2018 was greater (Iron Worker apprentices: 56%, All Crafts: 51%).
- *surplus* of Iron Worker apprentices in 2018 was slightly smaller (Iron Worker apprentices: 4%, All Crafts: 6%).

Compared to Iron Worker apprentices in 2017,

- there was a greater average *shortage* of Iron Worker apprentices in 2018 (2017: 2.2%, 2018: 3.9%).

Compared to all crafts combined in 2018,

- there was a greater average *shortage* of Iron Worker apprentices in 2018 (Iron Worker apprentices: 3.9%, All Crafts: 3.3%).

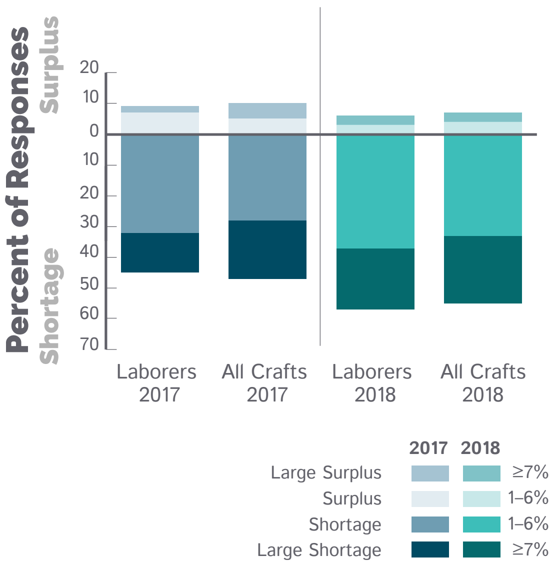
	2017		2018	
	Iron Workers	**All Crafts**	**Iron Workers**	**All Crafts**
Average	-2.2%	-1.6%	-3.9%	-3.3%
Surplus	7%	4%	2%	4%
Large Surplus	4%	6%	2%	2%
Shortage	38%	27%	33%	32%
Large Shortage	14%	13%	23%	19%

VII. LABORERS

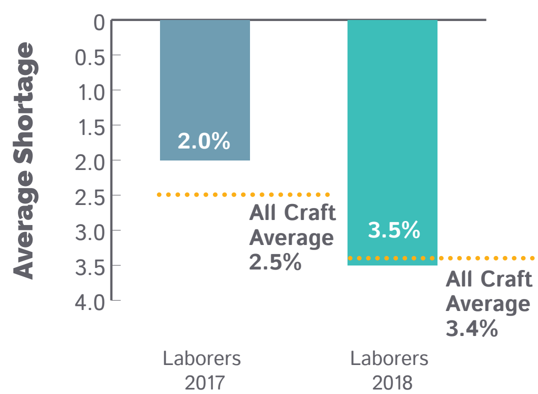
A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/ SURPLUS—LABORERS



AVERAGE SHORTAGE/SURPLUS—LABORERS



Compared to Laborers in 2017, the percent of respondents who reported a:

- *shortage* of Laborers in 2018 was greater (2017: 45%, 2018: 57%).
- *surplus* of Laborers in 2018 was smaller (2017: 9%, 2018: 6%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Laborers in 2018 was slightly greater (Laborers: 57%, All Crafts: 55%).
- *surplus* of Laborers in 2018 was slightly smaller (Laborers: 6%, All Crafts: 7%).

The reported surplus decreased and shortage increased for Laborers in 2018, however is comparable to all crafts combined in both shortage and surplus.

Compared to Laborers in 2017,

- there was a greater average *shortage* of Laborers in 2018 (2017: 2.0%, 2018: 3.5%).

Compared to all crafts combined in 2018,

- there was a greater average *shortage* of Laborers in 2018 (Laborers: 3.5%, All Crafts: 3.4%).

The average shortage for Laborers was larger in 2018 than 2017, resulting in their surpassing of the all craft average in 2018.

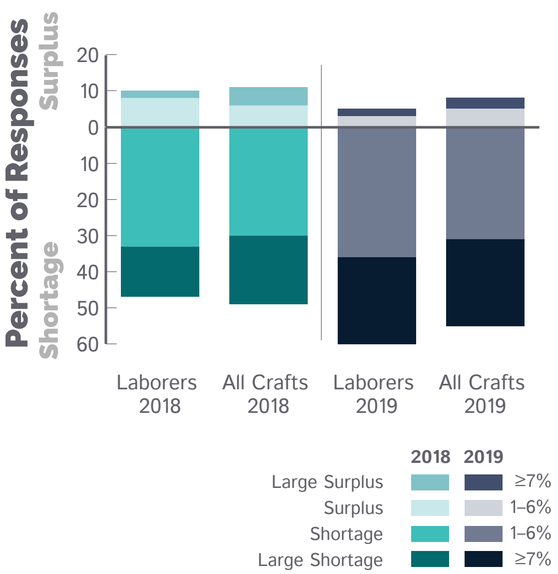
	2017		2018	
	Laborers	**All Crafts**	**Laborers**	**All Crafts**
Average	-2.0%	-2.5%	-3.5%	-3.4%
Surplus	7%	5%	3%	4%
Large Surplus	2%	5%	3%	3%
Shortage	32%	28%	37%	33%
Large Shortage	13%	19%	20%	22%

VII. LABORERS (continued)

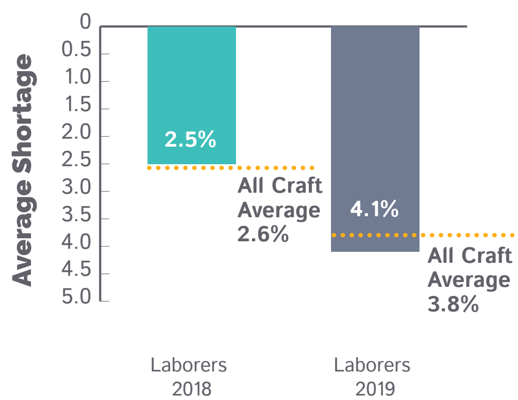
B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES PROJECTING A SHORTAGE/SURPLUS—LABORERS



AVERAGE SHORTAGE/SURPLUS PROJECTIONS—LABORERS



Compared to Laborers in 2018, the percent of respondents who projected a:

- *shortage* of Laborers in 2019 was greater (2018: 47%, 2019: 60%).
- *surplus* of Laborers in 2019 was smaller (2018: 10%, 2019: 5%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Laborers in 2019 was greater (Laborers: 60%, All Crafts: 55%).
- *surplus* of Laborers in 2019 was smaller (Laborers: 5%, All Crafts: 8%).

Compared to Laborers in 2018,

- there was a greater projected average *shortage* of Laborers in 2019 (2018: 2.5%, 2019: 4.1%).

Compared to all crafts combined in 2019,

- there was a greater projected average *shortage* of Laborers in 2019 (Laborers: 4.1%, All Crafts: 3.8%).

The projected shortage for Laborers was larger in 2019 than 2018, resulting in their surpassing of the all craft average in 2019.

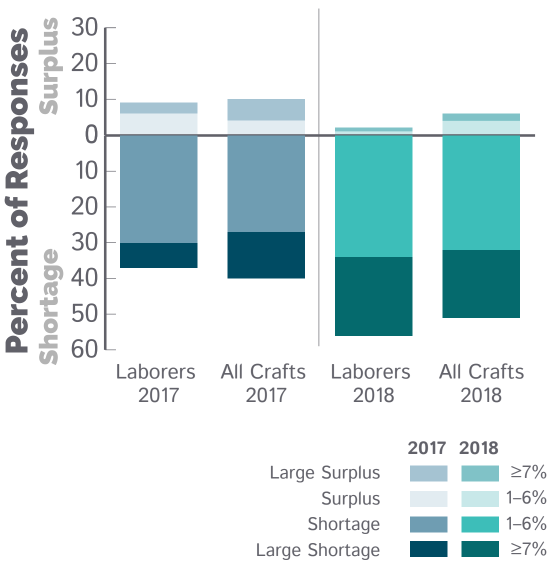
	2018		2019	
	Laborers	**All Crafts**	**Laborers**	**All Crafts**
Average	-2.5%	-2.6%	-4.1%	-3.8%
Surplus	8%	6%	3%	5%
Large Surplus	2%	5%	2%	3%
Shortage	33%	30%	36%	31%
Large Shortage	14%	19%	24%	24%

VII. LABORERS (continued)

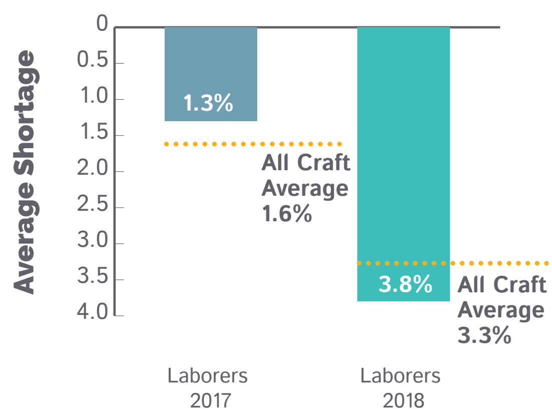
C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—LABORERS



AVERAGE SHORTAGE/SURPLUS FOR APPRENTICES - LABORERS



Compared to Laborer apprentices in 2017, the percent of respondents who reported a:

- *shortage* of Laborer apprentices in 2018 was greater (2017: 37%, 2018: 56%).
- *surplus* of Laborer apprentices in 2018 was smaller (2017: 9%, 2018: 2%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Laborer apprentices in 2018 was greater (Laborer apprentices: 56%, All Crafts: 51%).
- *surplus* of Laborer apprentices in 2018 was smaller (Laborer apprentices: 2%, All Crafts: 6%).

Compared to Laborer apprentices in 2017,

- there was a greater average *shortage* of Laborer apprentices in 2018 (2017: 1.3%, 2018: 3.8%).

Compared to all crafts combined in 2018,

- there was a greater average *shortage* of Laborer apprentices in 2018 (Laborer apprentices: 3.8%, All Crafts: 3.3%).

The average shortage for Laborers was larger in 2018 than 2017, resulting in their surpassing of the all craft average in 2018.

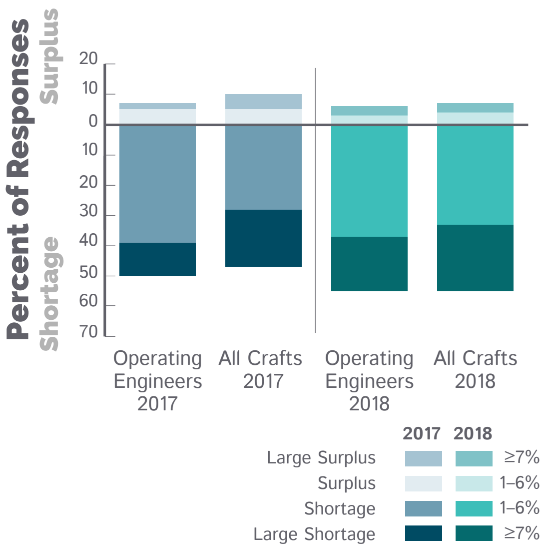
	2017		2018	
	Laborers	All Crafts	Laborers	All Crafts
Average	-1.3%	-1.6%	-3.8%	-3.3%
Surplus	6%	4%	1%	4%
Large Surplus	3%	6%	1%	2%
Shortage	30%	27%	34%	32%
Large Shortage	7%	13%	22%	19%

VIII. OPERATING ENGINEERS

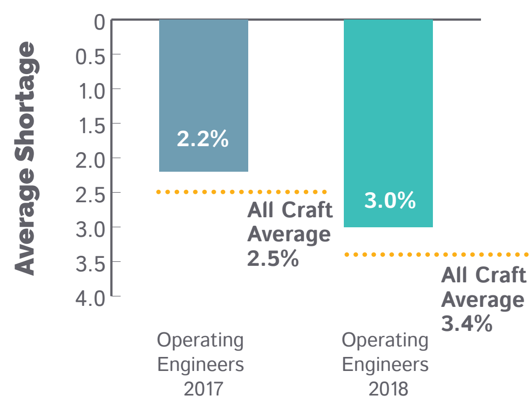
A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/ SURPLUS—OPERATING ENGINEERS



AVERAGE SHORTAGE/SURPLUS— OPERATING ENGINEERS



Compared to Operating Engineers in 2017, the percent of respondents who reported a:

- *shortage* of Operating Engineers in 2018 was greater (2017: 50%, 2018: 55%).
- *surplus* of Operating Engineers in 2018 was slightly smaller (2017: 7%, 2018: 6%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Operating Engineers in 2018 was the same (55%).
- *surplus* of Operating Engineers in 2018 was slightly smaller (Operating Engineers: 6%, All Crafts: 7%).

Operating Engineers' shortage increased & surplus fell in 2018, but both are on par with all crafts combined in 2018.

Compared to Operating Engineers in 2017,

- there was a greater average *shortage* of Operating Engineers in 2018 (2017: 2.2%, 2018: 3.0%).

Compared to all crafts combined in 2018,

- there was a smaller average *shortage* of Operating Engineers in 2018 (Operating Engineers: 3.0%, All Crafts: 3.4%).

The average reported shortage for Operating Engineers was larger in 2018 than 2017, but remained smaller than the all craft average.

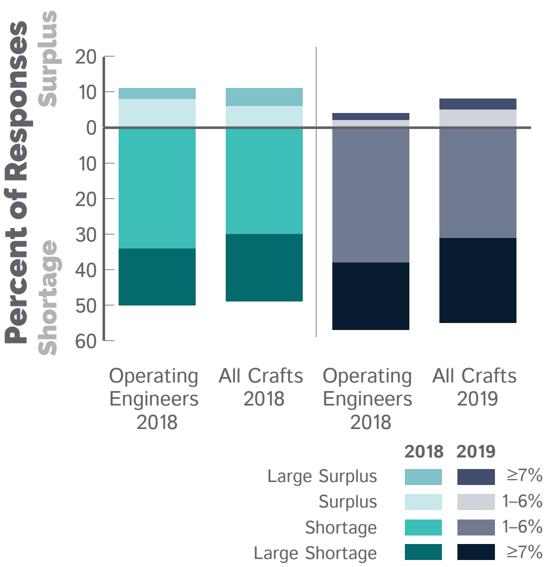
	2017		2018	
	Operating Engineers	**All Crafts**	**Operating Engineers**	**All Crafts**
Average	-2.2%	-2.5%	-3.0%	-3.4%
Surplus	5%	5%	3%	4%
Large Surplus	2%	5%	3%	3%
Shortage	39%	28%	37%	33%
Large Shortage	11%	19%	18%	22%

VIII. OPERATING ENGINEERS (continued)

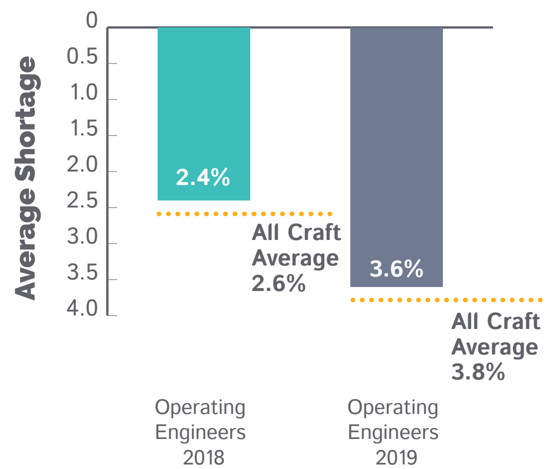
B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES PROJECTING A SHORTAGE/SURPLUS—OPERATING ENGINEERS



AVERAGE SHORTAGE/SURPLUS PROJECTIONS—OPERATING ENGINEERS



Compared to Operating Engineers in 2018, the percent of respondents who projected a:

- *shortage* of Operating Engineers in 2019 was greater (2018: 50%, 2019: 57%).
- *surplus* of Operating Engineers in 2019 was smaller (2018: 11%, 2019: 4%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Operating Engineers in 2019 was slightly greater (Operating Engineers: 57%, All Crafts: 55%).
- *surplus* of Operating Engineers in 2019 was smaller (Operating Engineers: 4%, All Crafts: 8%).

While the projected shortage for Operating Engineers increased in 2019, they remain comparable to the projection for all crafts combined.

Compared to Operating Engineers in 2018,

- there was a greater projected average *shortage* of Operating Engineers in 2019 (2018: 2.4%, 2019: 3.6%).

Compared to all crafts combined in 2019,

- there was a slightly smaller projected average *shortage* of Operating Engineers in 2019 (Operating Engineers: 3.6%, All Crafts: 3.8%).

The average projected shortage for Operating Engineers was larger in 2019 than 2018, but remained smaller than the all craft average.

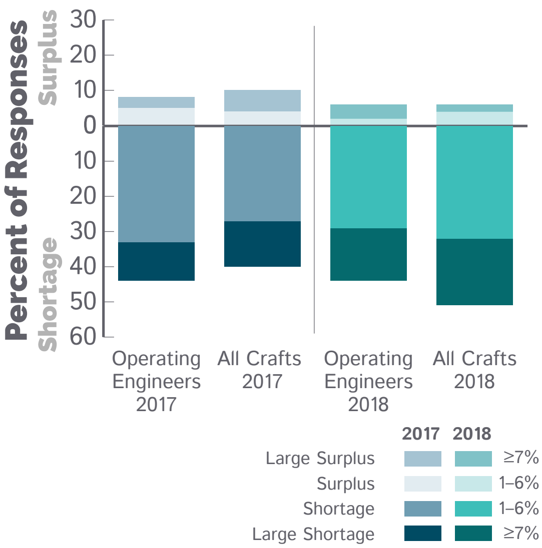
	2018		2019	
	Operating Engineers	All Crafts	Operating Engineers	All Crafts
Average	-2.4%	-2.6%	-3.6%	-3.8%
Surplus	8%	6%	2%	5%
Large Surplus	3%	5%	2%	3%
Shortage	34%	30%	38%	31%
Large Shortage	16%	19%	19%	24%

VIII. OPERATING ENGINEERS (continued)

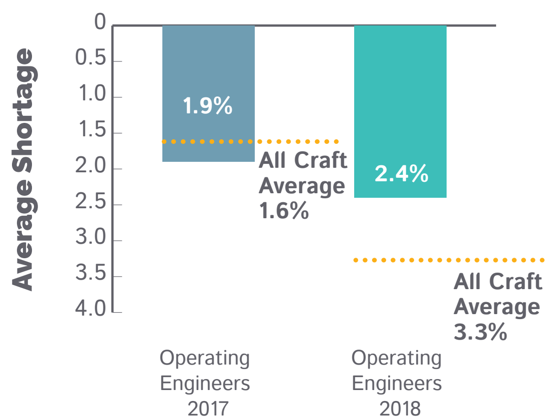
C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—OPERATING ENGINEERS



AVERAGE SHORTAGE/SURPLUS FOR APPRENTICES - OPERATING ENGINEERS



Compared to Operating Engineer apprentices in 2017, the percent of respondents who reported a:

- *shortage* of Operating Engineer apprentices in 2018 was the same (44%).
- *surplus* of Operating Engineer apprentices in 2018 was slightly smaller (2017: 8%, 2018: 6%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Operating Engineer apprentices in 2018 was smaller (Operating Engineer apprentices: 44%, All Crafts: 51%).
- *surplus* of Operating Engineer apprentices in 2018 was the same (6%).

In 2018, the shortage and surplus for Operating Engineer apprentices was very similar to 2017, but because all crafts combined had a larger shortage in 2018, Operating Engineer apprentices have a smaller shortage than the all craft average.

Compared to Operating Engineer apprentices in 2017,

- there was a greater average *shortage* of Operating Engineer apprentices in 2018 (2017: 1.9%, 2018: 2.4%).

Compared to all crafts combined in 2018,

- there was a smaller average *shortage* of Operating Engineer apprentices in 2018 (Operating Engineer apprentices: 2.4%, All Crafts: 3.3%).

The average shortage for Operating Engineer apprentices was larger in 2018 than 2017, but is now smaller than the all craft average, which was not the case in 2017.

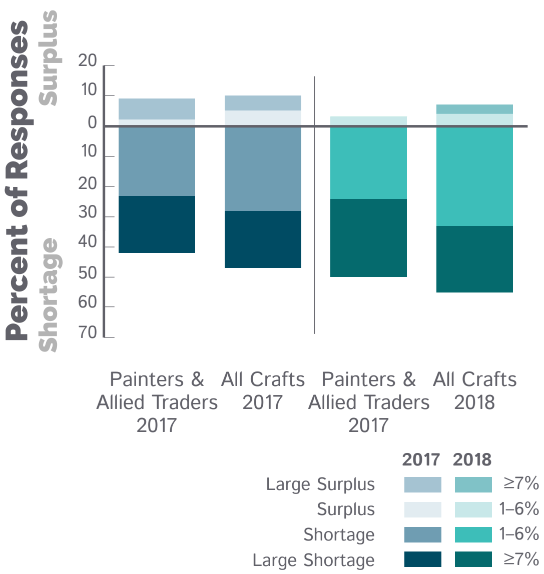
	2017		2018	
	Operating Engineers	**All Crafts**	**Operating Engineers**	**All Crafts**
Average	-1.9%	-1.6%	-2.4%	-3.3%
Surplus	5%	4%	2%	4%
Large Surplus	3%	6%	4%	2%
Shortage	33%	27%	29%	32%
Large Shortage	11%	13%	15%	19%

IX. PAINTERS & ALLIED TRADES

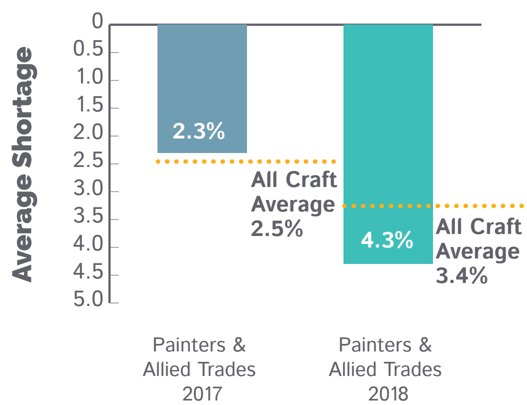
A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/ SURPLUS—PAINTERS & ALLIED TRADES



AVERAGE SHORTAGE/SURPLUS— PAINTERS & ALLIED TRADES



Compared to Painters & Allied Trades in 2017, the percent of respondents who reported a:

- *shortage* of Painters & Allied Trades in 2018 was greater (2017: 42%, 2018: 50%).
- *surplus* of Painters & Allied Trades in 2018 was smaller (2017: 9%, 2018: 3%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Painters & Allied Trades in 2018 was smaller (Painters & Allied Trades: 50%, All Crafts: 55%).
- *surplus* of Painters & Allied Trades in 2018 was smaller (Painters & Allied Trades: 3%, All Crafts: 7%).

Painters & Allied Trades had a larger shortage in 2018 compared to 2017, but the reported shortage remained smaller than all crafts combined in 2018.

Compared to Painters & Allied Trades in 2017,

- there was a greater average *shortage* of Painters & Allied Trades in 2018 (2017: 2.3%, 2018: 4.3%).

Compared to all crafts combined in 2018,

- there was a greater average *shortage* of Painters & Allied Trades in 2018 (Painters & Allied Trades: 4.3%, All Crafts: 3.4%).

The average reported shortage for Painters & Allied Trades was larger in 2018 than 2017, resulting in their surpassing of the all craft average.

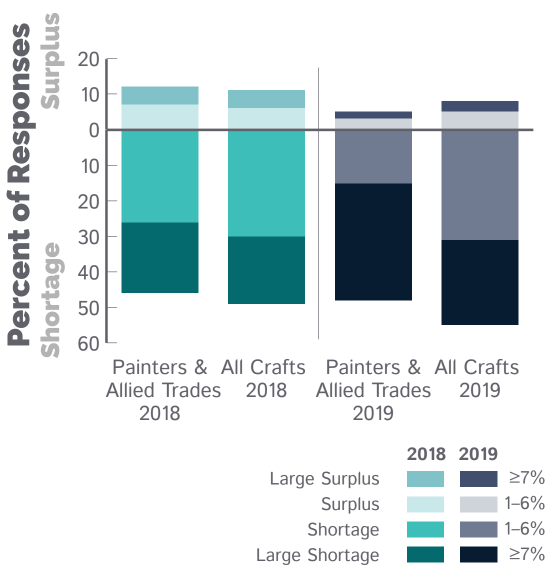
	2017		2018	
	Painters & Allied Trades	**All Crafts**	**Painters & Allied Trades**	**All Crafts**
Average	-2.3%	-2.5%	-4.3%	-3.4%
Surplus	2%	5%	3%	4%
Large Surplus	7%	5%	0%	3%
Shortage	23%	28%	24%	33%
Large Shortage	19%	19%	26%	22%

IX. PAINTERS & ALLIED TRADES (continued)

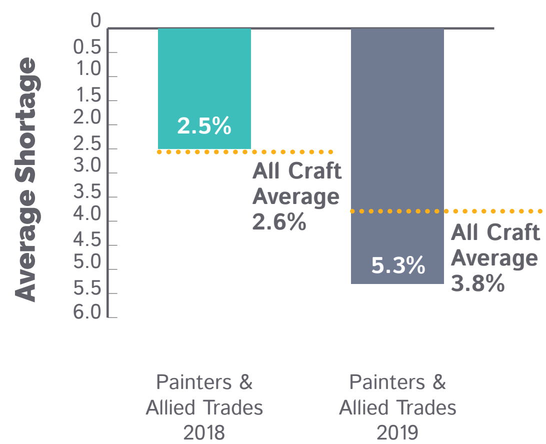
B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES PROJECTING A SHORTAGE/SURPLUS—PAINTERS & ALLIED TRADES



AVERAGE SHORTAGE/SURPLUS PROJECTIONS—PAINTERS & ALLIED TRADES



Compared to Painters & Allied Trades in 2018, the percent of respondents who projected a:

- *shortage* of Painters & Allied Trades in 2019 was slightly greater (2018: 46%, 2019: 48%).
- *surplus* of Painters & Allied Trades in 2019 was smaller (2018: 12%, 2019: 5%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Painters & Allied Trades in 2019 was smaller (Painters & Allied Trades: 48%, All Crafts: 55%).
- *surplus* of Painters & Allied Trades in 2019 was smaller (Painters & Allied Trades: 5%, All Crafts: 8%).

Painters & Allied Trades had a larger shortage projection in 2019, but the projected shortage remained smaller than all crafts combined.

Compared to Painters & Allied Trades in 2018,

- there was a greater projected average *shortage* of Painters & Allied Trades in 2019 (2018: 2.5%, 2019: 5.3%).

Compared to all crafts combined in 2019,

- there was a greater projected average *shortage* of Painters & Allied Trades in 2019 (Painters & Allied Trades: 5.3%, All Crafts: 3.8%).

The average projected shortage for Painters & Allied Trades was larger in 2019 than 2018, resulting in their surpassing of the all craft average projection.

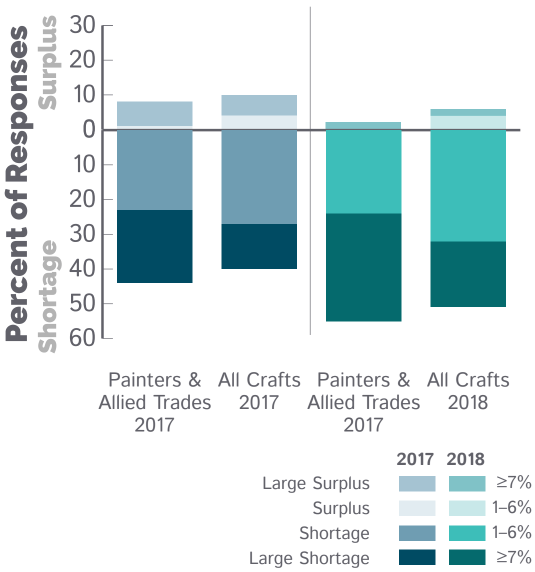
	2018		2019	
	Painters & Allied Trades	**All Crafts**	**Painters & Allied Trades**	**All Crafts**
Average	-2.5%	-2.6%	-5.3%	-3.8%
Surplus	7%	6%	3%	5%
Large Surplus	5%	5%	2%	3%
Shortage	26%	30%	15%	31%
Large Shortage	20%	19%	33%	24%

IX. PAINTERS & ALLIED TRADES (continued)

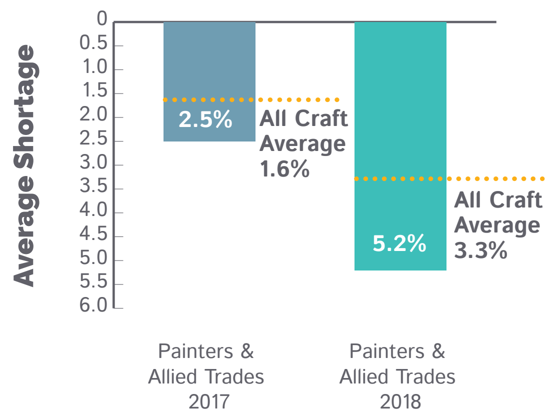
C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—PAINTERS & ALLIED TRADES



AVERAGE SHORTAGE/SURPLUS PROJECTIONS—PAINTERS & ALLIED TRADES



Compared to Painter & Allied Trade apprentices in 2017, the percent of respondents who reported a:

- *shortage* of Painter & Allied Trade apprentices in 2018 was greater (2017: 44%, 2018: 55%).
- *surplus* of Painter & Allied Trade apprentices in 2018 was smaller (2017: 8%, 2018: 2%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Painter & Allied Trade apprentices in 2018 was greater (Painter & Allied Trade apprentices: 55%, All Crafts: 51%).
- *surplus* of Painter & Allied Trade apprentices in 2018 was smaller (Painter & Allied Trade apprentices: 2%, All Crafts: 6%).

Compared to Painter & Allied Trade apprentices in 2017,

- there was a greater average *shortage* of Painter & Allied Trade apprentices in 2018 (2017: 2.5%, 2018: 5.2%).

Compared to all crafts combined in 2018,

- there was a greater average *shortage* of Painter & Allied Trade apprentices in 2018 (Painter & Allied Trade apprentices: 5.2%, All Crafts: 3.3%).

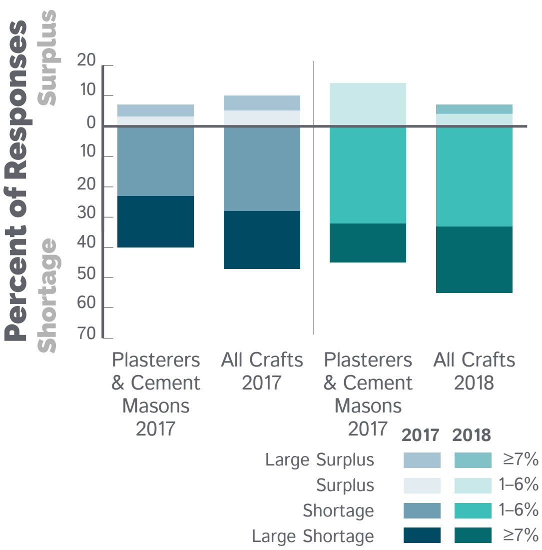
	2017		2018	
	Painters & Allied Trades	**All Crafts**	**Painters & Allied Trades**	**All Crafts**
Average	-2.5%	-1.6%	-5.2%	-3.3%
Surplus	1%	4%	0%	4%
Large Surplus	7%	6%	2%	2%
Shortage	23%	27%	24%	32%
Large Shortage	21%	13%	31%	19%

X. PLASTERERS & CEMENT MASONS

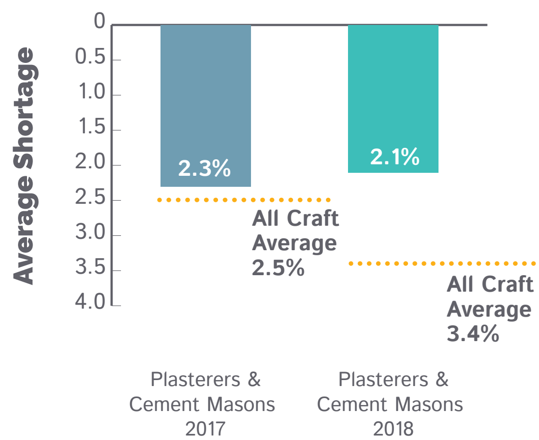
A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES REPORTING A SHORTAGE/ SURPLUS—PLASTERERS & CEMENT MASONS



AVERAGE SHORTAGE/SURPLUS FOR APPRENTICES— PLASTERERS & CEMENT MASONS



Compared to Plasterers & Cement Masons in 2017, the percent of respondents who reported a:

- *shortage* of Plasterers & Cement Masons in 2018 was greater (2017: 40%, 2018: 45%).
- *surplus* of Plasterers & Cement Masons in 2018 was greater (2017: 7%, 2018: 14%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Plasterers & Cement Masons in 2018 was smaller (Plasterers & Cement Masons: 45%, All Crafts: 55%).
- *surplus* of Plasterers & Cement Masons in 2018 was greater (Plasterers & Cement Masons: 14%, All Crafts: 7%).

Plasterers & Cement Masons had a larger reported shortage and a larger surplus in 2018; their surplus surpassed that of all crafts combined. Their shortage remained smaller than the all craft average.

Compared to Plasterers & Cement Masons in 2017,

- there was a slightly smaller average *shortage* of Plasterers & Cement Masons in 2018 (2017: 2.3%, 2018: 2.1%).

Compared to all crafts combined in 2018,

- there was a smaller average *shortage* of Plasterers & Cement Masons in 2018 (Plasterers & Cement Masons: 2.1%, All Crafts: 3.4%).

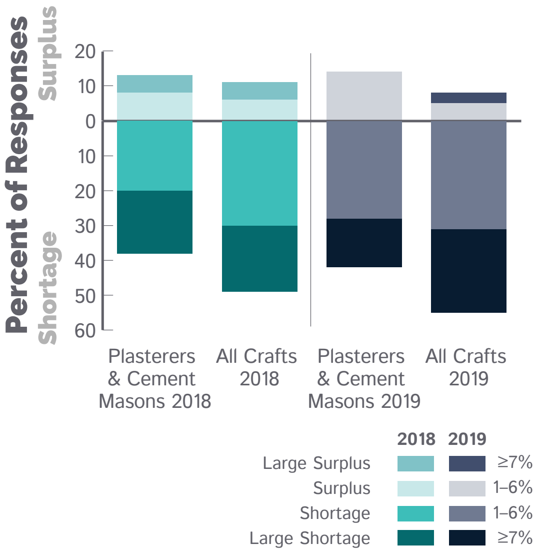
	2017		2018	
	Plasterers & Cement Masons	**All Crafts**	**Plasterers & Cement Masons**	**All Crafts**
Average	-2.3%	-2.5%	-2.1%	-3.4%
Surplus	3%	5%	14%	4%
Large Surplus	4%	5%	0%	3%
Shortage	23%	28%	32%	33%
Large Shortage	17%	19%	13%	22%

X. PLASTERERS & CEMENT MASONS (continued)

B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—PLASTERERS & CEMENT MASONS



Compared to Plasterers & Cement Masons in 2018, the percent of respondents who projected a:

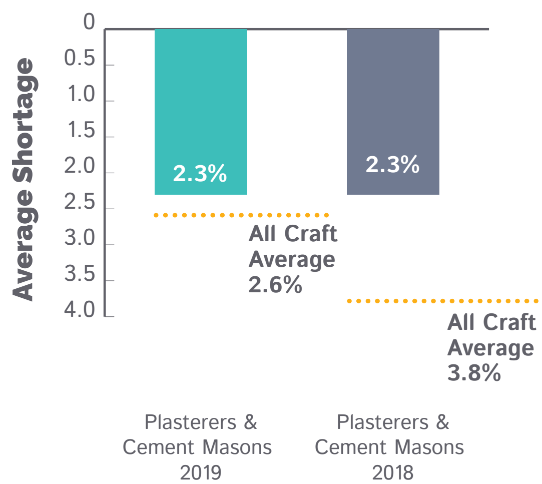
- *shortage* of Plasterers & Cement Masons in 2019 was greater (2018: 38%, 2019: 42%).
- *surplus* of Plasterers & Cement Masons in 2019 was slightly greater (2018: 13%, 2019: 14%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Plasterers & Cement Masons in 2019 was smaller (Plasterers & Cement Masons: 42%, All Crafts: 55%).
- *surplus* of Plasterers & Cement Masons in 2019 was greater (Plasterers & Cement Masons: 14%, All Crafts: 8%).

Plasterers & Cement Masons had a larger projected shortage and a larger surplus in 2019; their projected surplus surpassed that of all crafts combined. Their projected shortage remained smaller than the all craft average.

AVERAGE SHORTAGE/SURPLUS—PLASTERERS & CEMENT MASONS



Compared to Plasterers & Cement Masons in 2018,

- there was a similar projected average *shortage* of Plasterers & Cement Masons in 2019 (2.3%).

Compared to all crafts combined in 2019,

- there was a smaller projected average *shortage* of Plasterers & Cement Masons in 2019 (Plasterers & Cement Masons: 2.3%, All Crafts: 3.8%).

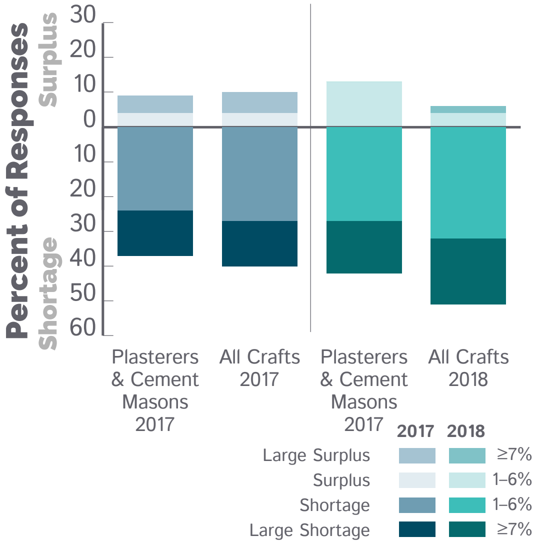
	2018		2019	
	Plasterers & Cement Masons	All Crafts	Plasterers & Cement Masons	All Crafts
Average	-2.3%	-2.6%	-2.3%	-3.8%
Surplus	8%	6%	14%	5%
Large Surplus	5%	5%	0%	3%
Shortage	20%	30%	28%	31%
Large Shortage	18%	19%	14%	24%

X. PLASTERERS & CEMENT MASONS (continued)

C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/ SURPLUS—PLASTERERS & CEMENT MASONS



Compared to Plasterer & Cement Mason apprentices in 2017, the percent of respondents who reported a:

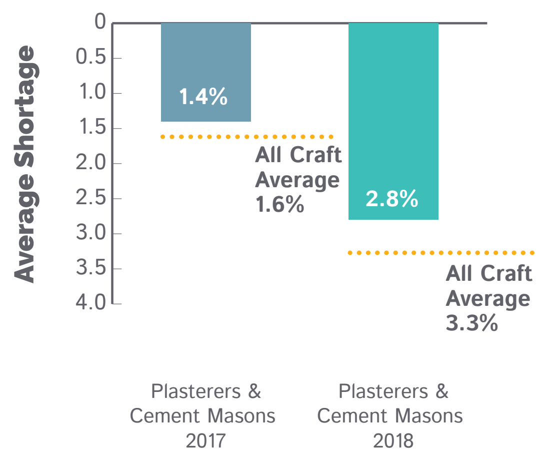
- *shortage* of Plasterer & Cement Mason apprentices in 2018 was greater (2017: 37%, 2018: 42%).
- *surplus* of Plasterer & Cement Mason apprentices in 2018 was greater (2017: 9%, 2018: 13%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Plasterer & Cement Mason apprentices in 2018 was smaller (Plasterer & Cement Mason apprentices: 42%, All Crafts: 51%).
- *surplus* of Plasterer & Cement Mason apprentices in 2018 was greater (Plasterer & Cement Mason apprentices: 13%, All Crafts: 6%).

Plasterer & Cement Mason apprentices had a larger reported shortage and surplus in 2018; their surplus surpassed that of all crafts combined. Their shortage remained smaller than the all craft average.

AVERAGE SHORTAGE/SURPLUS PROJECTIONS PLASTERERS & CEMENT MASONS



Compared to Plasterer & Cement Mason apprentices in 2017,

- there was a greater average *shortage* of Plasterer & Cement Mason apprentices in 2018 (2017: 1.4%, 2018: 2.8%).

Compared to all crafts combined in 2018,

- there was a smaller average *shortage* of Plasterer & Cement Mason apprentices in 2018 (Plasterer & Cement Mason apprentices: 2.8%, All Crafts: 3.3%).

Plasterer & Cement Mason apprentices had a larger shortage in 2018 than 2017, but still had a smaller shortage than the all craft average.

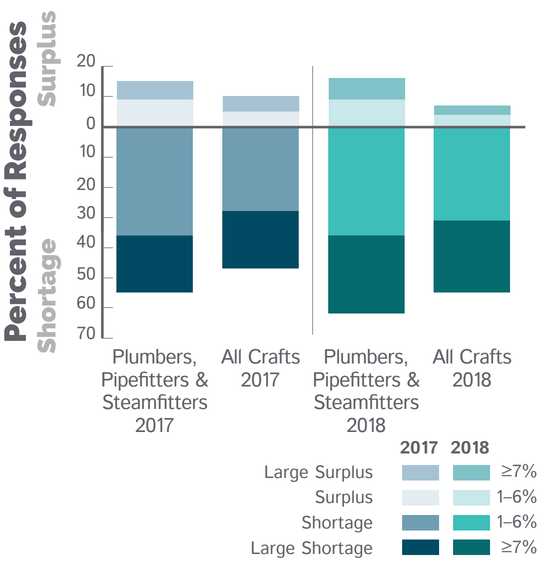
	2017		2018	
	Plasterers & Cement Masons	**All Crafts**	**Plasterers & Cement Masons**	**All Crafts**
Average	-1.4%	-1.6%	-2.8%	-3.3%
Surplus	4%	4%	13%	4%
Large Surplus	5%	6%	0%	2%
Shortage	24%	27%	27%	32%
Large Shortage	13%	13%	15%	19%

XI. PLUMBERS, PIPEFITTERS & STEAMFITTERS

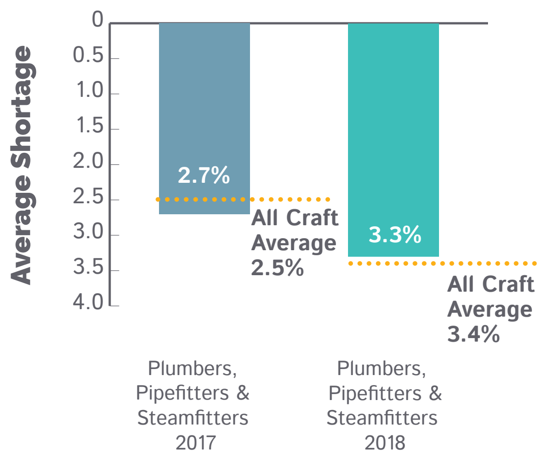
A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES REPORTING A SHORTAGE/SURPLUS—PLUMBERS, PIPEFITTERS & STEAMFITTERS



AVERAGE SHORTAGE/SURPLUS FOR APPRENTICES—PLUMBERS, PIPEFITTERS & STEAMFITTERS



Compared to Plumbers, Pipefitters & Steamfitters in 2017, the percent of respondents who reported a:

- *shortage* of Plumbers, Pipefitters & Steamfitters in 2018 was greater (2017: 55%, 2018: 62%).
- *surplus* of Plumbers, Pipefitters & Steamfitters in 2018 was slightly greater (2017: 15%, 2018: 16%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Plumbers, Pipefitters & Steamfitters in 2018 was greater (Plumbers, Pipefitters & Steamfitters: 62%, All Crafts: 55%).
- *surplus* of Plumbers, Pipefitters & Steamfitters in 2018 was greater (Plumbers, Pipefitters & Steamfitters: 16%, All Crafts: 7%).

Compared to Plumbers, Pipefitters & Steamfitters in 2017,

- there was a greater average *shortage* of Plumbers, Pipefitters & Steamfitters in 2018 (2017: 2.7%, 2018: 3.3%).

Compared to all crafts combined in 2018,

- there was a slightly smaller average *shortage* of Plumbers, Pipefitters & Steamfitters in 2018 (Plumbers, Pipefitters & Steamfitters: 3.3%, All Crafts: 3.4%).

The average reported shortage for Plumbers, Pipefitters & Steamfitters was larger than all craft average in 2018, but is now smaller than the all craft average, which was not the case in 2017.

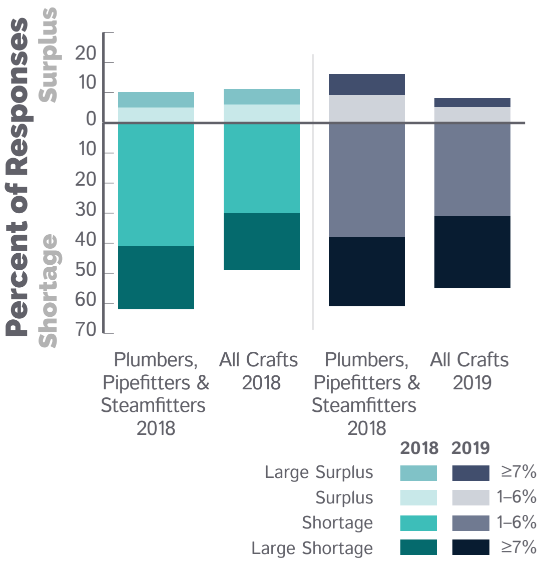
	2017		2018	
	Plumbers, Pipefitters & Steamfitters	**All Crafts**	**Plumbers, Pipefitters & Steamfitters**	**All Crafts**
Average	-2.7%	-2.5%	-3.3%	-3.4%
Surplus	9%	5%	9%	4%
Large Surplus	6%	5%	7%	3%
Shortage	36%	28%	36%	33%
Large Shortage	19%	19%	26%	22%

XI. PLUMBERS, PIPEFITTERS & STEAMFITTERS (continued)

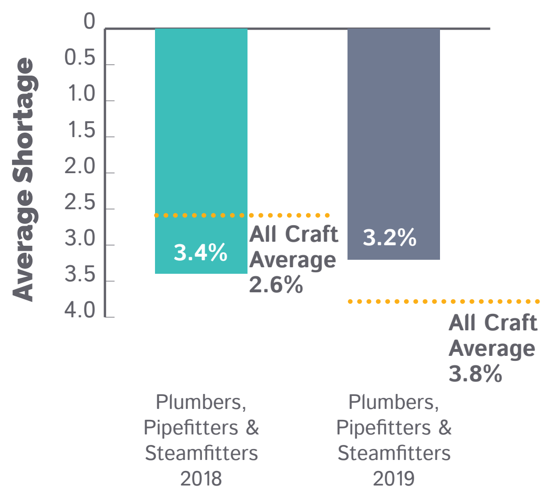
B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/ SURPLUS—PLUMBERS, PIPEFITTERS & STEAMFITTERS



AVERAGE SHORTAGE/SURPLUS—PLUMBERS, PIPEFITTERS & STEAMFITTERS



Compared to Plumbers, Pipefitters & Steamfitters in 2018, the percent of respondents who projected a:

- *shortage* of Plumbers, Pipefitters & Steamfitters in 2019 was smaller (2018: 62%, 2019: 61%).
- *surplus* of Plumbers, Pipefitters & Steamfitters in 2019 was greater (2018: 10%, 2019: 16%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Plumbers, Pipefitters & Steamfitters in 2019 was greater (Plumbers, Pipefitters & Steamfitters: 61%, All Crafts: 55%).
- *surplus* of Plumbers, Pipefitters & Steamfitters in 2019 was greater (Plumbers, Pipefitters & Steamfitters: 16%, All Crafts: 8%).

Plumbers, Pipefitters & Steamfitters project a larger surplus in 2019, surpassing the all craft average projection in 2019.

Compared to Plumbers, Pipefitters & Steamfitters in 2018,

- there was a slightly smaller projected average *shortage* of Plumbers, Pipefitters & Steamfitters in 2019 (2018: 3.4%, 2019: 3.2%).

Compared to all crafts combined in 2019,

- there was a smaller projected average *shortage* of Plumbers, Pipefitters & Steamfitters in 2019 (Plumbers, Pipefitters & Steamfitters: 3.2%, All Crafts: 3.8%).

Plumbers, Pipefitters & Steamfitters improved from a larger projected shortage than the all craft average in 2018 to a smaller projected shortage than the all craft average in 2019.

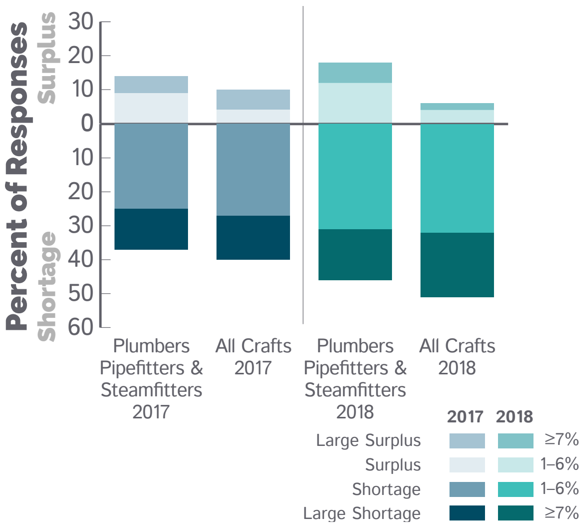
	2018		2019	
	Plumbers, Pipefitters & Steamfitters	All Crafts	Plumbers, Pipefitters & Steamfitters	All Crafts
Average	-3.4%	-2.6%	-3.2%	-3.8%
Surplus	5%	6%	9%	5%
Large Surplus	5%	5%	7%	3%
Shortage	41%	30%	38%	31%
Large Shortage	21%	19%	23%	24%

XI. PLUMBERS, PIPEFITTERS & STEAMFITTERS (continued)

C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—PLUMBERS, PIPEFITTERS & STEAMFITTERS



Compared to Plumber, Pipefitter & Steamfitter apprentices in 2017, the percent of respondents who reported a:

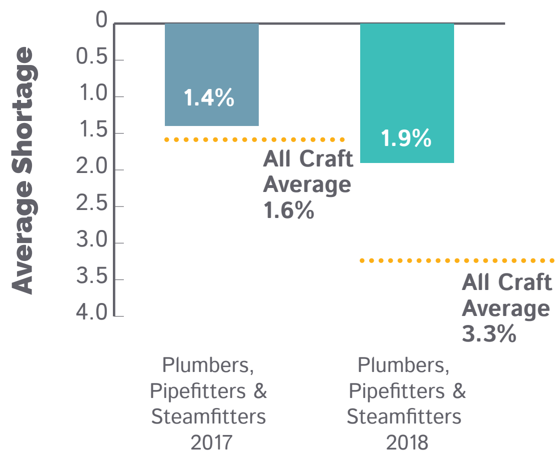
- *shortage* of Plumber, Pipefitter & Steamfitter apprentices in 2018 was greater (2017: 37%, 2018: 46%).
- *surplus* of Plumber, Pipefitter & Steamfitter apprentices in 2018 was greater (2017: 14%, 2018: 18%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Plumber, Pipefitter & Steamfitter apprentices in 2018 was smaller (Plumber, Pipefitter & Steamfitter apprentices: 46%, All Crafts: 51%).
- *surplus* of Plumber, Pipefitter & Steamfitter apprentices in 2018 was greater (Plumber, Pipefitter & Steamfitter apprentices: 18%, All Crafts: 6%).

While Plumber, Pipefitter & Steamfitter apprentices increased in both their reported shortage and surplus, they remained smaller in shortage and greater in surplus compared to all crafts combined.

AVERAGE SHORTAGE/SURPLUS PROJECTIONS—PLUMBERS, PIPEFITTERS & STEAMFITTERS



Compared to Plumber, Pipefitter & Steamfitter apprentices in 2017,

- there was a greater average *shortage* of Plumber, Pipefitter & Steamfitter apprentices in 2018 (2017: 1.4%, 2018: 1.9%).

Compared to all crafts combined in 2018,

- there was a smaller average *shortage* of Plumber, Pipefitter & Steamfitter apprentices in 2018 (Plumber, Pipefitter & Steamfitter apprentices: 1.9%, All Crafts: 3.3%).

While Plumber, Pipefitter & Steamfitter apprentices increased in reported average shortage, they remained smaller than the all craft average shortage.

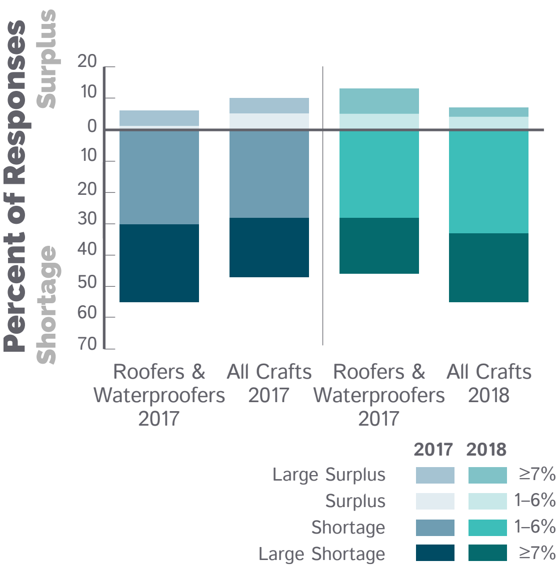
	2017		2018	
	Plumbers, Pipefitters & Steamfitters	All Crafts	Plumbers, Pipefitters & Steamfitters	All Crafts
Average	-1.4%	-1.6%	-1.9%	-3.3%
Surplus	9%	4%	12%	4%
Large Surplus	5%	6%	6%	2%
Shortage	25%	27%	31%	32%
Large Shortage	12%	13%	15%	19%

XII. ROOFERS & WATERPROOFERS

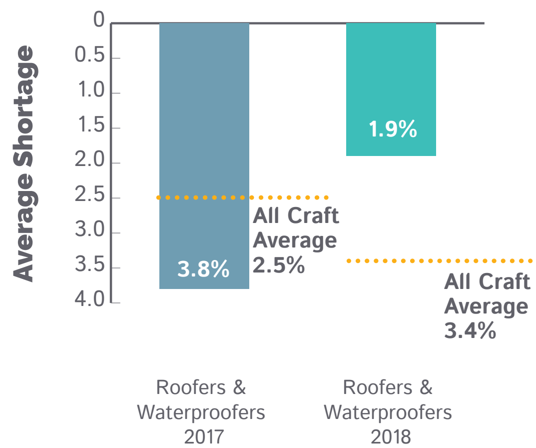
A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES REPORTING A SHORTAGE/ SURPLUS—ROOFERS & WATERPROOFERS



AVERAGE SHORTAGE/SURPLUS FOR APPRENTICES—ROOFERS AND WATERPROOFERS



Compared to Roofers & Waterproofers in 2017, the percent of respondents who reported a:

- *shortage* of Roofers & Waterproofers in 2018 was smaller (2017: 55%, 2018: 46%).
- *surplus* of Roofers & Waterproofers in 2018 was greater (2017: 6%, 2018: 13%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Roofers & Waterproofers in 2018 was smaller (Roofers & Waterproofers: 46%, All Crafts: 55%).
- *surplus* of Roofers & Waterproofers in 2018 was greater (Roofers & Waterproofers: 13%, All Crafts: 7%).

Compared to Roofers & Waterproofers in 2017,

- there was a smaller average *shortage* of Roofers & Waterproofers in 2018 (2017: 3.8%, 2018: 1.9%).

Compared to all crafts combined in 2018,

- there was a smaller average *shortage* of Roofers & Waterproofers in 2018 (Roofers & Waterproofers: 1.9%, All Crafts: 3.4%).

Roofers & Waterproofers improved from a larger shortage than the all craft average in 2017 to a smaller shortage than the all craft average in 2018.

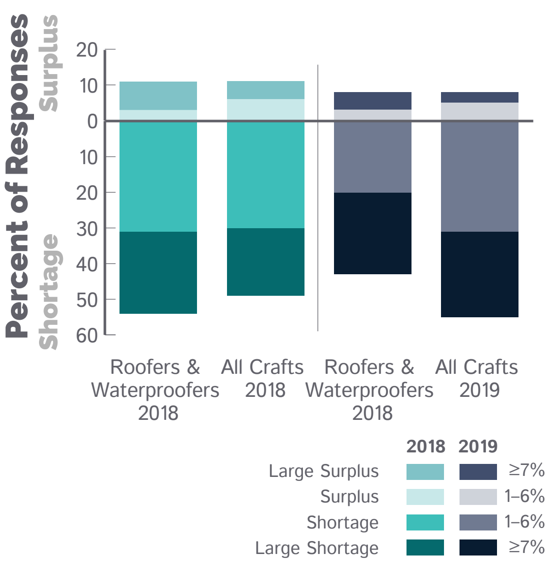
	2017		2018	
	Roofers & Waterproofers	**All Crafts**	**Roofers & Waterproofers**	**All Crafts**
Average	-3.8%	-2.5%	-1.9%	-3.4%
Surplus	1%	5%	5%	4%
Large Surplus	5%	5%	8%	3%
Shortage	30%	28%	28%	33%
Large Shortage	25%	19%	18%	22%

XII. ROOFERS & WATERPROOFERS (continued)

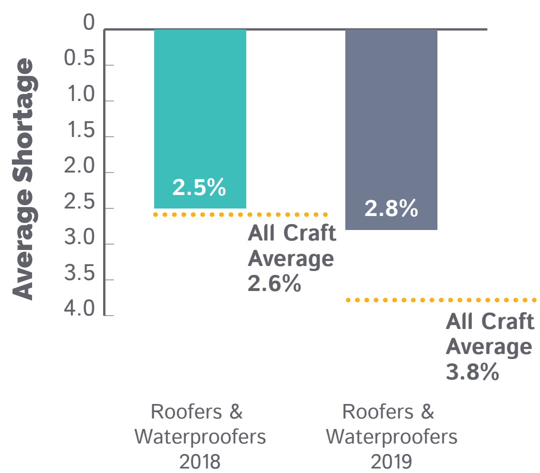
B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—ROOFERS & WATERPROOFERS



AVERAGE SHORTAGE/SURPLUS—ROOFERS & WATERPROOFERS



Compared to Roofers & Waterproofers in 2018, the percent of respondents who projected a:

- *shortage* of Roofers & Waterproofers in 2019 was smaller (2018: 54%, 2019: 43%).
- *surplus* of Roofers & Waterproofers in 2019 was smaller (2018: 11%, 2019: 8%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Roofers & Waterproofers in 2019 was smaller (Roofers & Waterproofers: 43%, All Crafts: 55%).
- *surplus* of Roofers & Waterproofers in 2019 was about the same (8%).

The projected surplus for Roofers & Waterproofers was smaller in 2019 compared to 2018, but remained comparable to the projected surplus of all crafts combined.

Compared to Roofers & Waterproofers in 2018,

- there was a greater projected average *shortage* of Roofers & Waterproofers in 2019 (2018: 2.5%, 2019: 2.8%).

Compared to all crafts combined in 2019,

- there was a smaller projected average *shortage* of Roofers & Waterproofers in 2019 (Roofers & Waterproofers: 2.8%, All Crafts: 3.8%).

Roofers & Waterproofers had a larger projected shortage in 2019 than 2018, but still had a smaller projected shortage than the all craft projection in 2019.

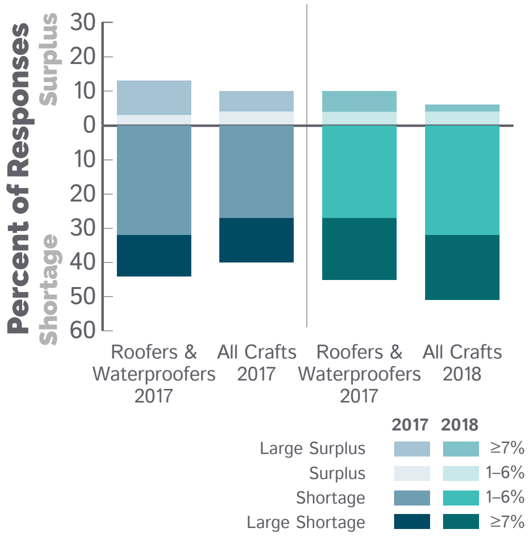
	2018		2019	
	Roofers & Waterproofers	**All Crafts**	**Roofers & Waterproofers**	**All Crafts**
Average	-2.5%	-2.6%	-2.8%	-3.8%
Surplus	3%	6%	3%	5%
Large Surplus	8%	5%	5%	3%
Shortage	31%	30%	20%	31%
Large Shortage	23%	19%	23%	24%

XII. ROOFERS & WATERPROOFERS (continued)

C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/ SURPLUS—ROOFERS & WATERPROOFERS



Compared to Roofer & Waterproofer apprentices in 2017, the percent of respondents who reported a:

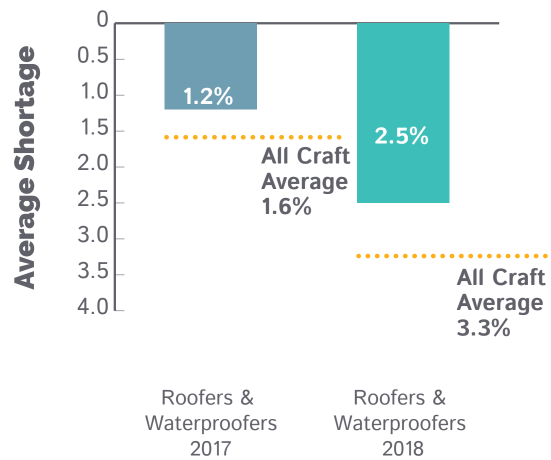
- *shortage* of Roofer & Waterproofer apprentices in 2018 was slightly greater (2017: 44%, 2018: 45%).
- *surplus* of Roofer & Waterproofer apprentices in 2018 was smaller (2017: 13%, 2018: 10%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Roofer & Waterproofer apprentices in 2018 was smaller (Roofer & Waterproofer apprentices: 45%, All Crafts: 51%).
- *surplus* of Roofer & Waterproofer apprentices in 2018 was greater (Roofer & Waterproofer apprentices: 10%, All Crafts: 6%).

While Roofer & Waterproofer apprentices had a smaller surplus and similar shortage in 2018 compared to 2017, they reported a larger surplus and smaller shortage than the all craft average in 2018.

AVERAGE SHORTAGE/SURPLUS PROJECTIONS—ROOFERS & WATERPROOFERS



Compared to Roofer & Waterproofer apprentices in 2017,

- there was a greater average *shortage* of Roofer & Waterproofer apprentices in 2018 (2017: 1.2%, 2018: 2.5%).

Compared to all crafts combined in 2018,

- there was a smaller average *shortage* of Roofer & Waterproofer apprentices in 2018 (Roofer & Waterproofer apprentices: 2.5%, All Crafts: 3.3%).

While Roofer & Waterproofer apprentices increased in reported shortage in 2018, they remained below the all craft average.

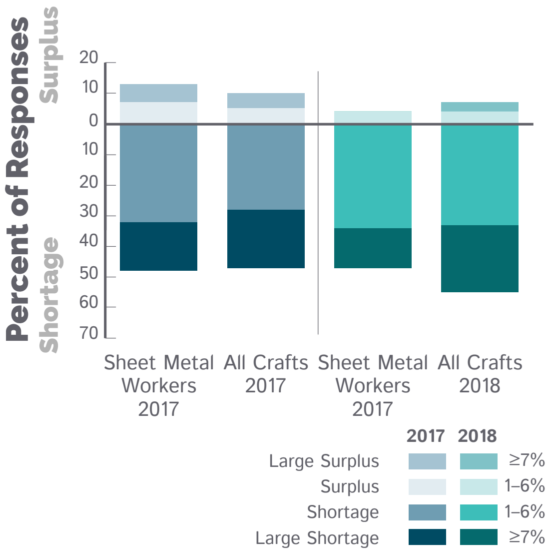
	2017		2018	
	Roofers & Waterproofers	**All Crafts**	**Roofers & Waterproofers**	**All Crafts**
Average	-1.2%	-1.6%	-2.5%	-3.3%
Surplus	3%	4%	4%	4%
Large Surplus	10%	6%	6%	2%
Shortage	32%	27%	27%	32%
Large Shortage	12%	13%	18%	19%

XIII. SHEET METAL WORKERS

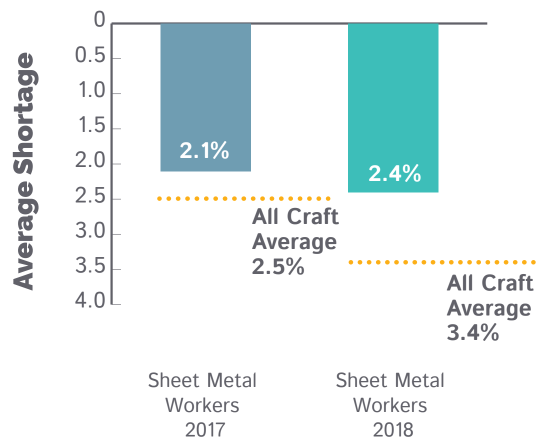
A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES REPORTING A SHORTAGE/SURPLUS—SHEET METAL WORKERS



AVERAGE SHORTAGE/SURPLUS FOR APPRENTICES—SHEET METAL WORKERS



Compared to Sheet Metal Workers in 2017, the percent of respondents who reported a:

- *shortage* of Sheet Metal Workers in 2018 was the same (48%).
- *surplus* of Sheet Metal Workers in 2018 was smaller (2017: 13%, 2018: 4%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Sheet Metal Workers in 2018 was smaller (Sheet Metal Workers: 48%, All Crafts: 55%).
- *surplus* of Sheet Metal Workers in 2018 was smaller (Sheet Metal Workers: 4%, All Crafts: 7%).

In 2018, Sheet Metal Workers were below both surplus and shortage for all crafts combined. Neither was the case in 2017.

Compared to Sheet Metal Workers in 2017,

- there was a greater average *shortage* of Sheet Metal Workers in 2018 (2017: 2.1%, 2018: 2.4%).

Compared to all crafts combined in 2018,

- there was a smaller average *shortage* of Sheet Metal Workers in 2018 (Sheet Metal Workers: 2.4%, All Crafts: 3.4%).

The reported average shortage for Sheet Metal Workers increased from 2017 to 2018, but remained smaller than the all craft average in 2018.

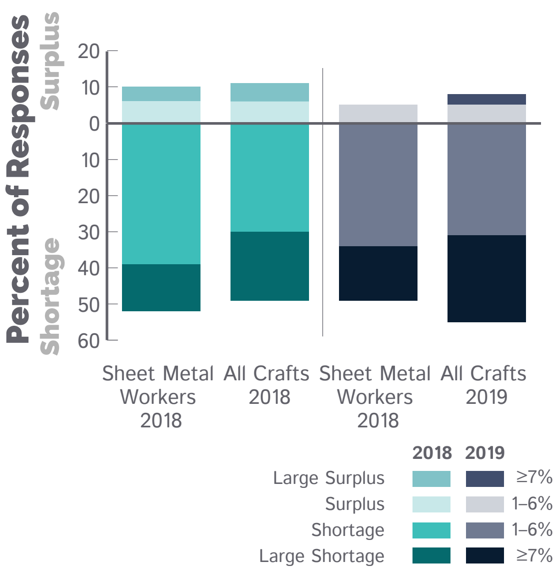
	2017		2018	
	Sheet Metal Workers	**All Crafts**	**Sheet Metal Workers**	**All Crafts**
Average	-2.1%	-2.5%	-2.4%	-3.4%
Surplus	7%	5%	4%	4%
Large Surplus	6%	5%	0%	3%
Shortage	32%	28%	35%	33%
Large Shortage	16%	19%	13%	22%

XIII. SHEET METAL WORKERS (continued)

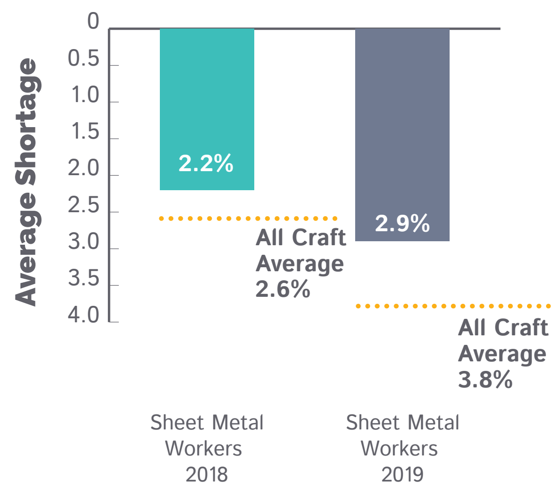
B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/ SURPLUS—SHEET METAL WORKERS



AVERAGE SHORTAGE/SURPLUS— SHEET METAL WORKERS



Compared to Sheet Metal Workers in 2018, the percent of respondents who projected a:

- *shortage* of Sheet Metal Workers in 2019 was smaller (2018: 52%, 2019: 49%).
- *surplus* of Sheet Metal Workers in 2019 was smaller (2018: 10%, 2019: 5%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Sheet Metal Workers in 2019 was smaller (Sheet Metal Workers: 49%, All Crafts: 55%).
- *surplus* of Sheet Metal Workers in 2019 was smaller (Sheet Metal Workers: 5%, All Crafts: 8%).

For 2019, the shortage for Sheet Metal Workers were projected below all crafts combined. This was not the case in 2018.

Compared to Sheet Metal Workers in 2018,

- there was a greater projected average *shortage* of Sheet Metal Workers in 2019 (2018: 2.2%, 2019: 2.9%).

Compared to all crafts combined in 2019,

- there was a smaller projected average *shortage* of Sheet Metal Workers in 2019 (Sheet Metal Workers: 2.9%, All Crafts: 3.8%).

While Sheet Metal Workers increased in projected average shortage and surplus, they remain smaller than the all craft average shortage projection for 2019.

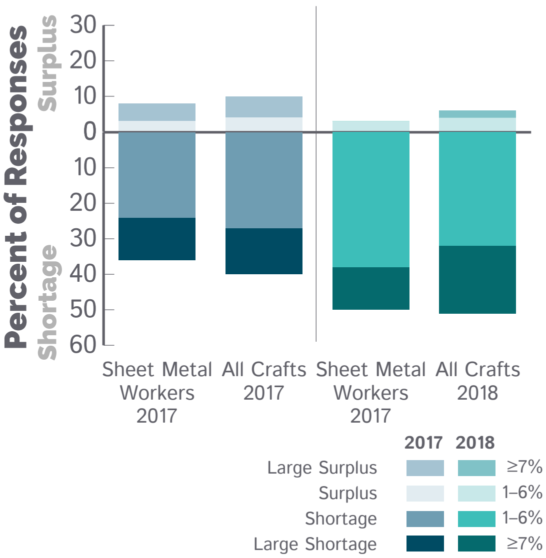
	2018		2019	
	Sheet Metal Workers	**All Crafts**	**Sheet Metal Workers**	**All Crafts**
Average	-2.2%	-2.6%	-2.9%	-3.8%
Surplus	6%	6%	5%	5%
Large Surplus	4%	5%	0%	3%
Shortage	39%	30%	34%	31%
Large Shortage	13%	19%	15%	24%

XIII. SHEET METAL WORKERS (continued)

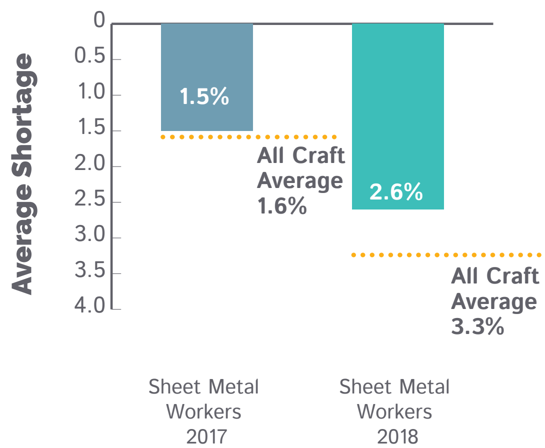
C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/ SURPLUS—SHEET METAL WORKERS



AVERAGE SHORTAGE/SURPLUS PROJECTIONS—SHEET METAL WORKERS



Compared to Sheet Metal apprentices in 2017, the percent of respondents who reported a:

- *shortage* of Sheet Metal Workers in 2018 was greater (2017: 36%, 2018: 50%).
- *surplus* of Sheet Metal Workers in 2018 was smaller (2017: 8%, 2018: 3%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Sheet Metal Workers in 2018 was slightly smaller (Sheet Metal Workers: 50%, All Crafts: 51%).
- *surplus* of Sheet Metal Workers in 2018 was smaller (Sheet Metal Workers: 3%, All Crafts: 6%).

Sheet Metal Workers reported an increase in their shortage in 2018. Thus, they are now similar to all crafts combined.

Compared to Sheet Metal Workers in 2017,

- there was a greater average *shortage* of Sheet Metal Workers in 2018 (2017: 1.5%, 2018: 2.6%).

Compared to all crafts combined in 2018,

- there was a smaller average *shortage* of Sheet Metal Workers in 2018 (Sheet Metal Workers: 2.6%, All Crafts: 3.3%).

While Sheet Metal Workers increased in average shortage, they remain smaller than the all craft average for 2018.

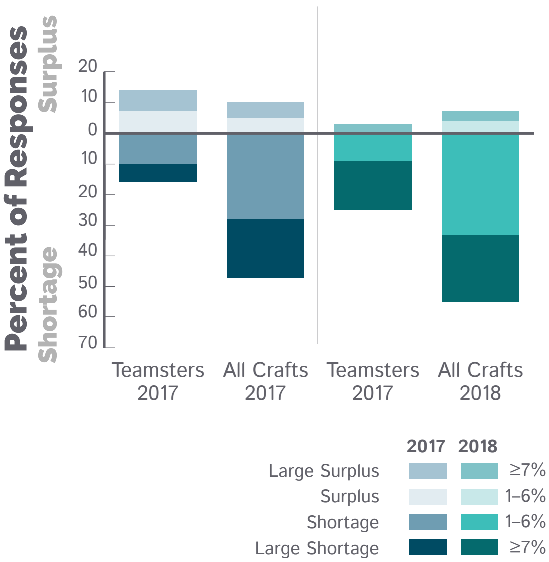
	2017		2018	
	Sheet Metal Workers	**All Crafts**	**Sheet Metal Workers**	**All Crafts**
Average	-1.5%	-1.6%	-2.6%	-3.3%
Surplus	3%	4%	3%	4%
Large Surplus	5%	6%	0%	2%
Shortage	24%	27%	38%	32%
Large Shortage	12%	13%	12%	19%

XIV. TEAMSTERS

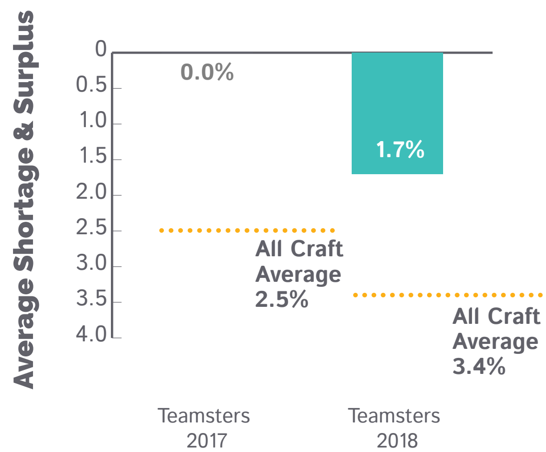
A. Historical Results: 2017 & 2018

This section shows results for questions where study participants were asked to report on the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/ SURPLUS—TEAMSTERS



AVERAGE SHORTAGE/SURPLUS—TEAMSTERS



Compared to Teamsters in 2017, the percent of respondents who reported a:

- *shortage* of Teamsters in 2018 was greater (2017: 16%, 2018: 25%).
- *surplus* of Teamsters in 2018 was smaller (2017: 14%, 2018: 3%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Teamsters in 2018 was smaller (Teamsters: 25%, All Crafts: 55%).
- *surplus* of Teamsters in 2018 was smaller (Teamsters: 3%, All Crafts: 7%).

Teamsters had a smaller reported surplus in 2018, thus fell below all crafts combined.

Compared to Teamsters in 2017,

- there was a greater average *shortage* of Teamsters in 2018 (2017: 0.0%, 2018: 1.7%).

Compared to all crafts combined in 2018,

- there was a smaller average *shortage* of Teamsters in 2018 (Teamsters: 1.7%, All Crafts: 3.4%).

Even though Teamsters increased in their average shortage in 2018, they still have a noticeably smaller reported average shortage than the all craft average.

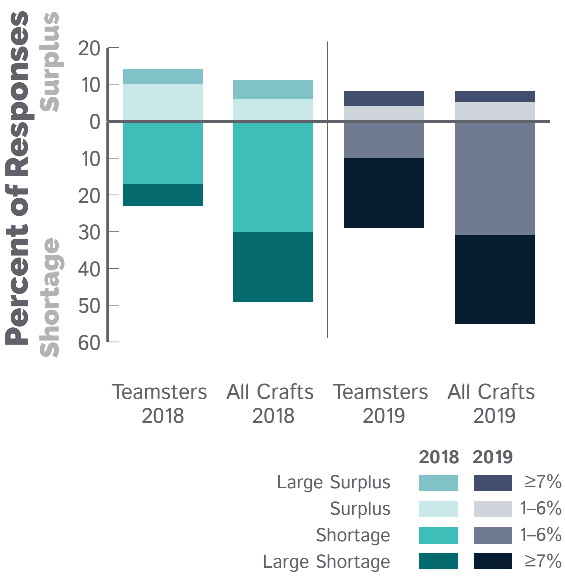
	2017		2018	
	Teamsters	**All Crafts**	**Teamsters**	**All Crafts**
Average	0.0%	-2.5%	-1.7%	-3.4%
Surplus	7%	5%	0%	4%
Large Surplus	7%	5%	3%	3%
Shortage	10%	28%	9%	33%
Large Shortage	6%	19%	16%	22%

XIV. TEAMSTERS (continued)

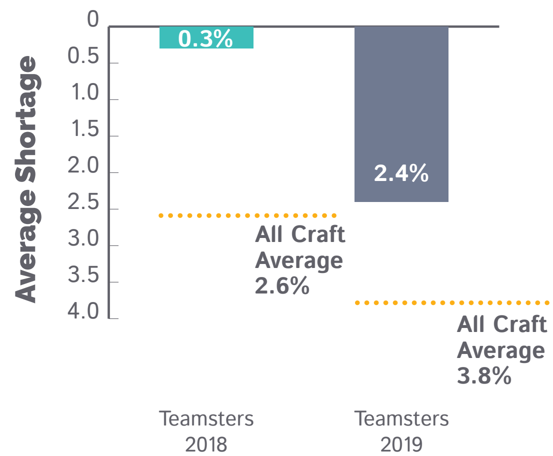
B. Projections for the Next Year: 2018 & 2019

This section shows results for questions where study participants were asked to project the union craft labor shortage/surplus for the upcoming year. Projections for 2018 came from last year's study (conducted early in 2018); projections for 2019 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES PROJECTING A SHORTAGE/SURPLUS—TEAMSTERS



AVERAGE SHORTAGE/SURPLUS PROJECTIONS—TEAMSTERS



Compared to Teamsters in 2018, the percent of respondents who projected a:

- *shortage* of Teamsters in 2019 was greater (2018: 23%, 2019: 29%).
- *surplus* of Teamsters in 2019 was smaller (2018: 14%, 2019: 8%).

Compared to all crafts combined in 2019, the percent of respondents who projected a:

- *shortage* of Teamsters in 2019 was smaller (Teamsters: 29%, All Crafts: 55%).
- *surplus* of Teamsters in 2019 was the same (8%).

Even though Teamsters had a larger projected shortage and a smaller projected surplus in 2019, they are still comparable in projected surplus and smaller in projected shortage compared to all crafts combined.

Compared to Teamsters in 2018,

- there was a greater projected average shortage of Teamsters in 2019 (2018: 0.3%, 2019: 2.4%).

Compared to all crafts combined in 2019,

- there was a smaller projected average *shortage* of Teamsters in 2019 (Teamsters: 2.4%, All Crafts: 3.8%).

Even though Teamsters increased in their projected shortage in 2019, they still have a smaller projected average shortage than that of all crafts.

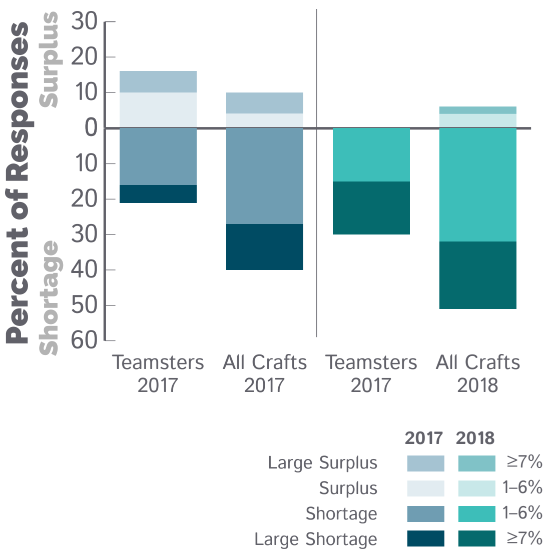
	2018		2019	
	Teamsters	**All Crafts**	**Teamsters**	**All Crafts**
Average	-0.3%	-2.6%	-2.4%	-3.8%
Surplus	10%	6%	4%	5%
Large Surplus	4%	5%	4%	3%
Shortage	17%	30%	10%	31%
Large Shortage	6%	19%	19%	24%

XIV. TEAMSTERS (continued)

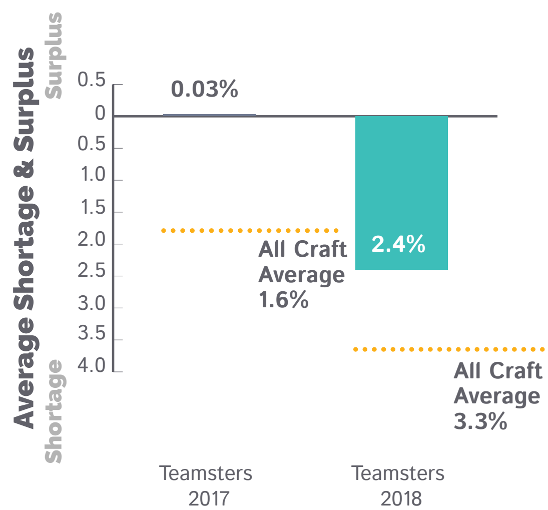
C. Apprentices: 2017 & 2018

This section shows results for questions where study participants were asked to report on the status of apprentices from the previous year. That is, the data for 2017 comes from last year's study (conducted early in 2018) where participants were asked to rate the actual/historical union craft labor shortage/surplus of apprentices for the previous year. Data for 2018 came from this year's study (conducted early in 2019).

PERCENT OF RESPONSES STATING A SHORTAGE/SURPLUS—TEAMSTERS



AVERAGE SHORTAGE/SURPLUS FOR APPRENTICES—TEAMSTERS



Compared to Teamster apprentices in 2017, the percent of respondents who reported a:

- *shortage* of Teamster apprentices in 2018 was greater (2017: 21%, 2018: 30%).
- *surplus* of Teamster apprentices in 2018 was smaller (2017: 16%, 2018: 0%).

Compared to all crafts combined in 2018, the percent of respondents who reported a:

- *shortage* of Teamster apprentices in 2018 was smaller (Teamster apprentices: 30%, All Crafts: 51%).
- *surplus* of Teamster apprentices in 2018 was smaller (Teamster apprentices: 0%, All Crafts: 6%).

Even though Teamster apprentices had a greater reported shortage in 2018, they are still smaller compared to all crafts combined.

Compared to Teamster apprentices in 2017,

- there was a greater average *shortage* of Teamster apprentices in 2018 (2017: 0.03%, 2018: 2.4%).

Compared to all crafts combined in 2018,

- there was a smaller average *shortage* of Teamster apprentices in 2018 (Teamster apprentices: 2.4%, All Crafts: 3.3%).

Even though Teamster apprentices fell from their reported very small surplus in 2017 to a shortage in 2018, they are still smaller than the all craft average.

	2017		2018	
	Teamsters	**All Crafts**	**Teamsters**	**All Crafts**
Average	0.03%	-1.6%	-2.4%	-3.3%
Surplus	10%	4%	0%	4%
Large Surplus	6%	6%	0%	2%
Shortage	16%	27%	15%	32%
Large Shortage	5%	13%	15%	19%

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