

# Attachment 5

## City of Seattle Construction Hiring Analysis

### APPRENTICESHIP ANALYSIS

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# OUTLINE

## **1 INFORMATION AND BACKGROUND**

- Background
- Research Questions
- Terms and Concepts

## **2 CURRENT DEMOGRAPHIC CHARACTERISTICS**

- Race, Gender, and Place of Residence
- Breakouts for Electrician, Carpenter, and Laborer Apprentices

## **3 COMPLETIONS AND CANCELLATIONS**

- Race, Gender, and Place of Residence
- Breakouts for Electrician, Carpenter, and Laborer Apprentices

## **4 MAJOR TAKEAWAYS**

## BACKGROUND

In 2014, the City of Seattle commissioned Community Attributes to analyze data on apprenticeship performance. Given recent changes in the workforce landscape, the City of Seattle desires an update with additional information to describe the current characteristics of apprentices in the tri-county, King County, and Seattle areas.

## RESEARCH QUESTIONS

There are three primary research questions:

- What is the average completion time for construction apprentices and what is the completion rate? Do these metrics vary by race, gender, or place of residence?
- What are the current demographic characteristics of construction apprentices in terms of race, gender, or place of residence?
- Are any of these metrics different for electrician, carpenter, and laborer apprenticeships?

## TERMS AND CONCEPTS

**Races** discussed in this report follow standards used by federal and state government entities. Races are self-reported by apprentices. Namely, the major race categories are:

- White
- Black or African American
- Asian
- American Indian or Native Alaskan
- Native Hawaiian or Other Pacific Islander
- Hispanic—while federal sources define ‘Hispanic’ as an ethnicity, not a race, apprentices can self-identify their race as Hispanic
- Unknown

**People of Color** includes non-white construction workers. This definition is consistent with the definition used in past construction hiring analysis for the City of Seattle.

The **Completion Rate** for apprentices is defined as the number of apprenticeship completions in a given year divided by the sum of apprentice completions, cancellations, transfers, and suspensions from the same year.

The **Cancellation Rate** for apprentices is defined as the number of apprenticeship cancellations in a given year divided by the sum of apprentice completions, cancellations, transfers, and suspensions from the same year.

**Apprentice Location** refers to the counties or cities where individual apprentices live.

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## **4** MAJOR TAKEAWAYS

### ACTIVE CONSTRUCTION APPRENTICES BY RACE AND GEOGRAPHY

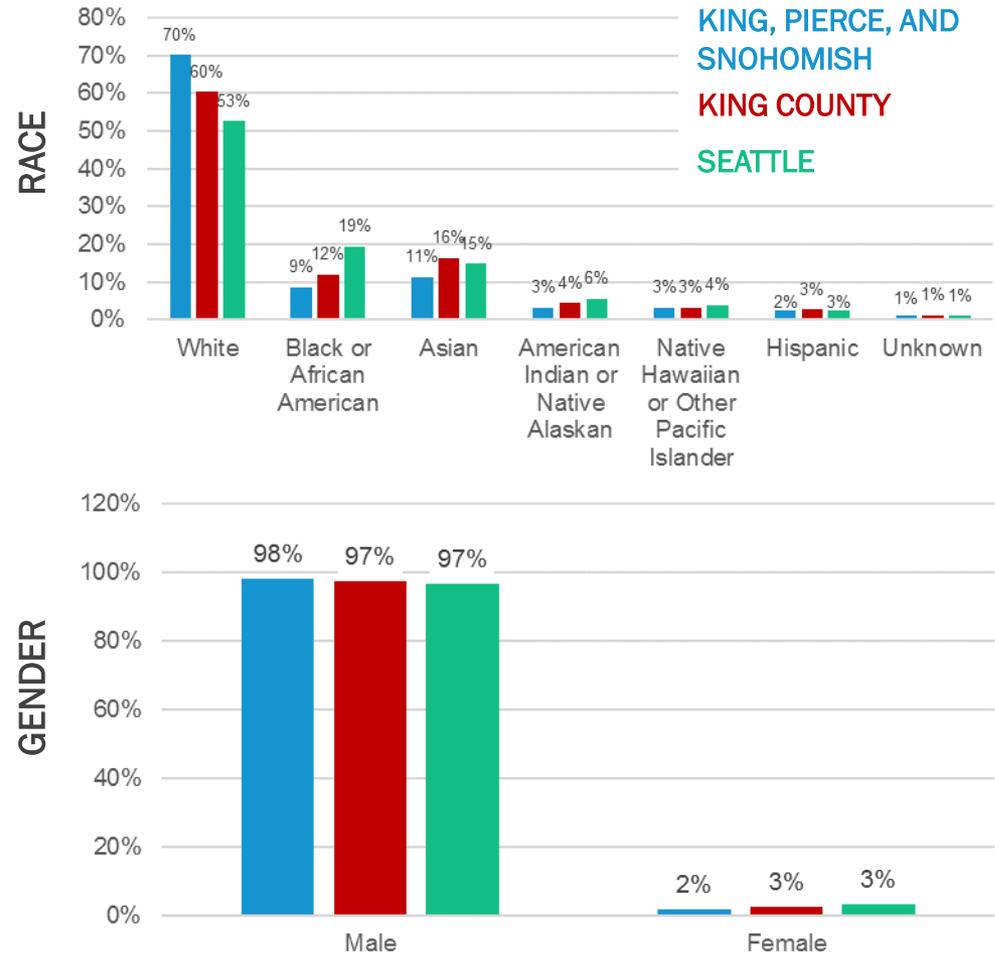
Active construction apprentices during the 2011-2015 period had several notable demographic characteristics between the three geographic levels of King, Pierce, and Snohomish Counties; King County; and Seattle.

Higher shares of people of color in active apprenticeships lived in King County than the broader geography of King, Pierce, and Snohomish Counties.

In King, Pierce, and Snohomish Counties, 30% of construction apprentices were people of color in the 2011-2015 period (921 apprentices). In King County, 39% were people of color (425 apprentices). In Seattle, 46% were people of color (148 apprentices).

### EXHIBIT 1. ACTIVE CONSTRUCTION APPRENTICES BY RACE AND GENDER

King, Pierce, and Snohomish Counties; King County; and Seattle, 2011-2015



### ACTIVE CONSTRUCTION APPRENTICES BY RACE AND GEOGRAPHY

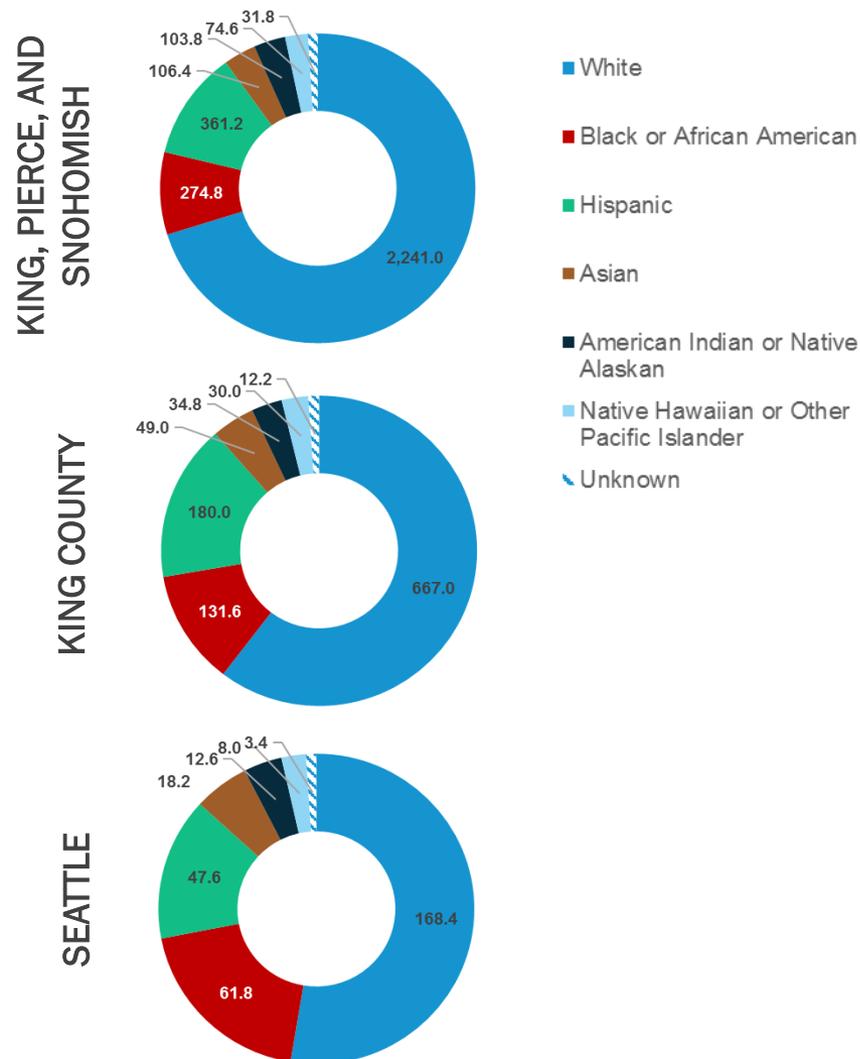
From 2011 through 2015, there were roughly 3,196 annual average active apprentices living in King, Pierce, and Snohomish Counties. Of those apprentices, roughly a third lived in King County, a total of 1,105 average annual apprentices. Seattle was home to 320 of these apprentices.

Approximately 70% of these apprentices were white. The next-largest group of apprentices by race was Hispanic at 11% followed by Black or African American at 9%.

These shares varied significantly in King County and Seattle. In particular, the ratio of white apprentices to all other apprentices was lower in King County than the broader region of King, Pierce, and Snohomish Counties. Focusing in even further to Seattle, the ratio of white apprentices to all other apprentices was even lower.

### EXHIBIT 2. ACTIVE CONSTRUCTION APPRENTICES BY RACE

King, Pierce, and Snohomish Counties; King County; and Seattle, 2011-2015 average



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

### ACTIVE FEMALE CONSTRUCTION APPRENTICES BY RACE AND GEOGRAPHY

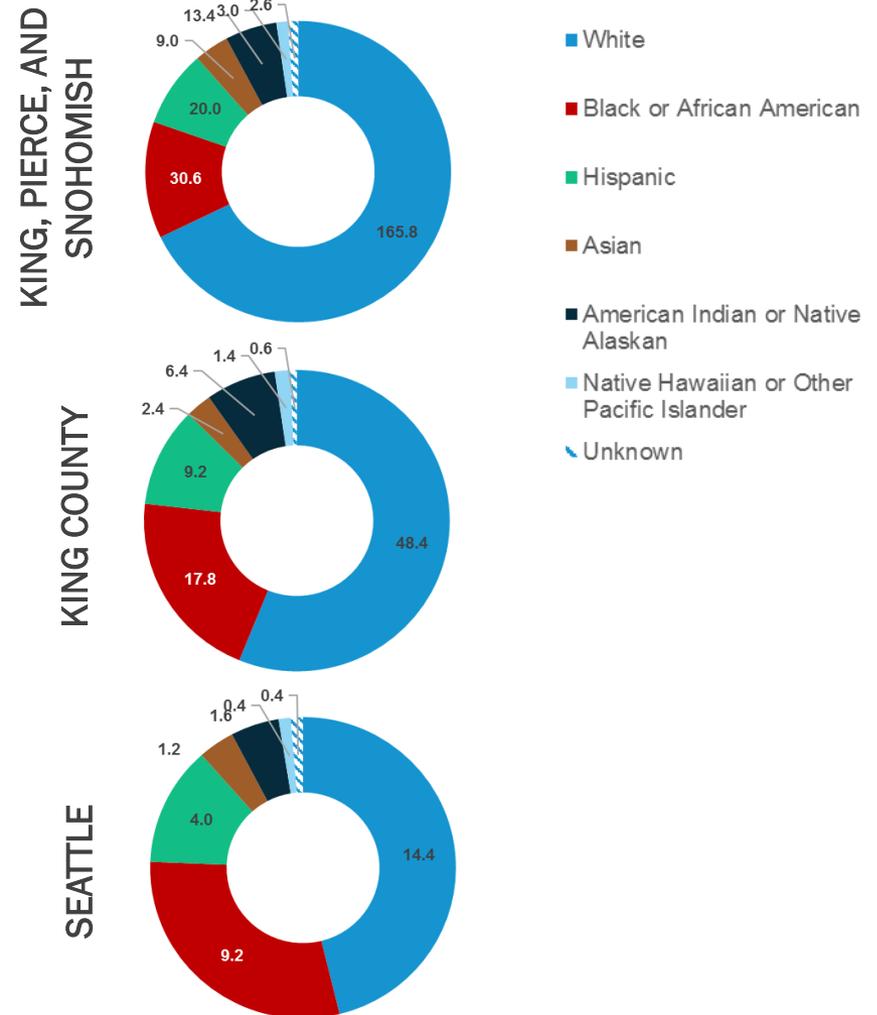
Overall, 31% of female construction apprentices from 2011 through 2015 identified as people of color.

Female construction apprentices were notably more likely to identify as people of color in this time period: at the King, Pierce, and Snohomish Counties level, 31% of female construction apprentices were people of color compared to 29% for all construction apprentices. In King County, 43% of female construction apprentices were people of color while 39% of total apprentices were white. The same trend is evident within the City of Seattle, where 53% of female construction apprentices were people of color compared to 46% of total apprentices.

It is also important to note that female people of color were more likely to be Black or African American. In this time period, 13% of female construction apprentices were Black or African American compared to 9% for all active apprentices.

### EXHIBIT 3. ACTIVE FEMALE CONSTRUCTION APPRENTICES BY RACE

King, Pierce, and Snohomish Counties; King County; and Seattle, 2011-2015 average



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

### ACTIVE MALE CONSTRUCTION APPRENTICES BY RACE AND GEOGRAPHY

From 2011 through 2015, 29% of male construction apprentices identified as people of color.

Male construction apprentices were more likely to identify as white than female apprentices: from 2011 through 2015, 70% of active male construction apprentices were white compared to 68% of female construction apprentices.

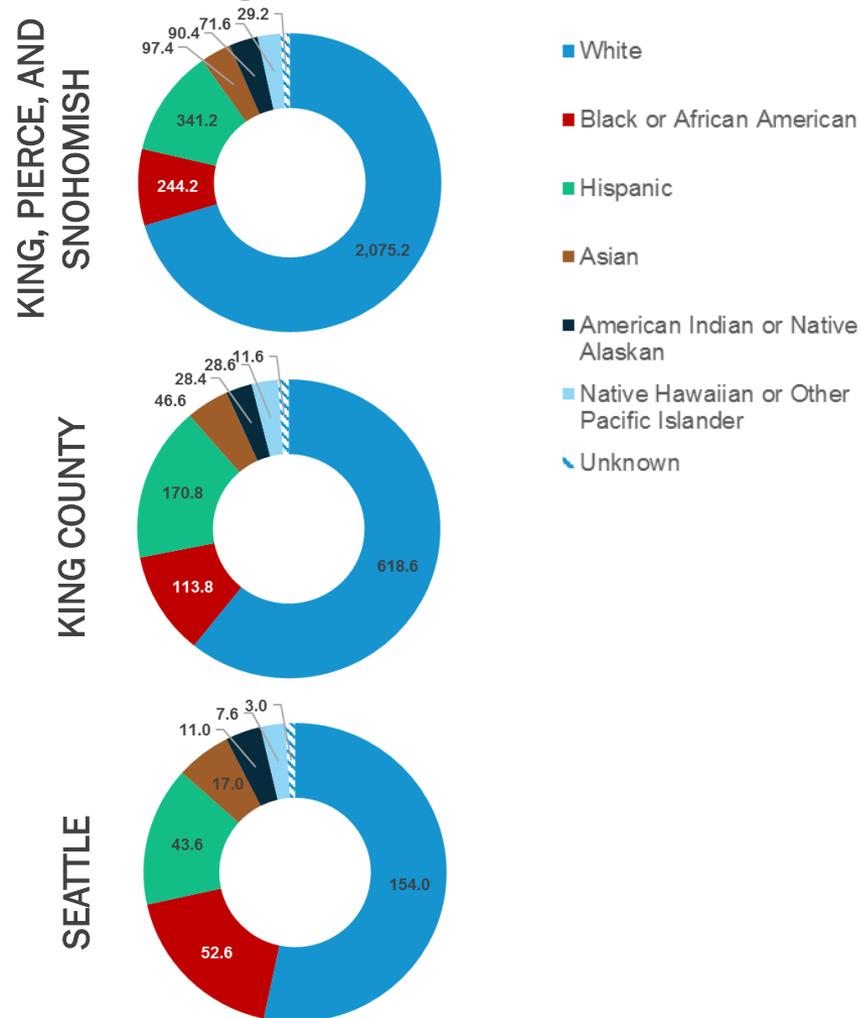
Narrowing the geographic lens to just King County, the same is true with 61% of male apprentices identifying as white compared to 56% of female apprentices.

Looking at Seattle only, 53% of male construction apprentices were white compared to 46% of female construction apprentices.

Comparing the race breakdown of male and female apprentices, female apprentices are notably more likely to identify as Black or African American than male apprentices: 13% for female apprentices compared to 8% for male apprentices in all of King, Pierce, and Snohomish Counties.

### EXHIBIT 4. ACTIVE MALE CONSTRUCTION APPRENTICES BY RACE

King, Pierce, and Snohomish Counties; King County; and Seattle, 2011-2015 average



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

### EDUCATIONAL STATUS OF CONSTRUCTION APPRENTICES

From 2011 through 2015, the average educational attainment levels of active apprentices revealed one key observation: construction apprentices in the City of Seattle had higher shares of the most educated and least educated apprentices than the two broader geographies.

### EXHIBIT 5. EDUCATIONAL STATUS OF CONSTRUCTION APPRENTICES

King, Pierce, and Snohomish Counties, 2011-2015 average

<b>Education</b>	<b>Total</b>	<b>Share</b>
High School Graduate	1,502	47%
College or Greater	702	22%
GED	580	18%
Some High School (9th-12th)	169	5%
8th grade or less	20	1%
Not Specified	223	7%
<b>Total</b>	<b>3,196</b>	<b>100%</b>

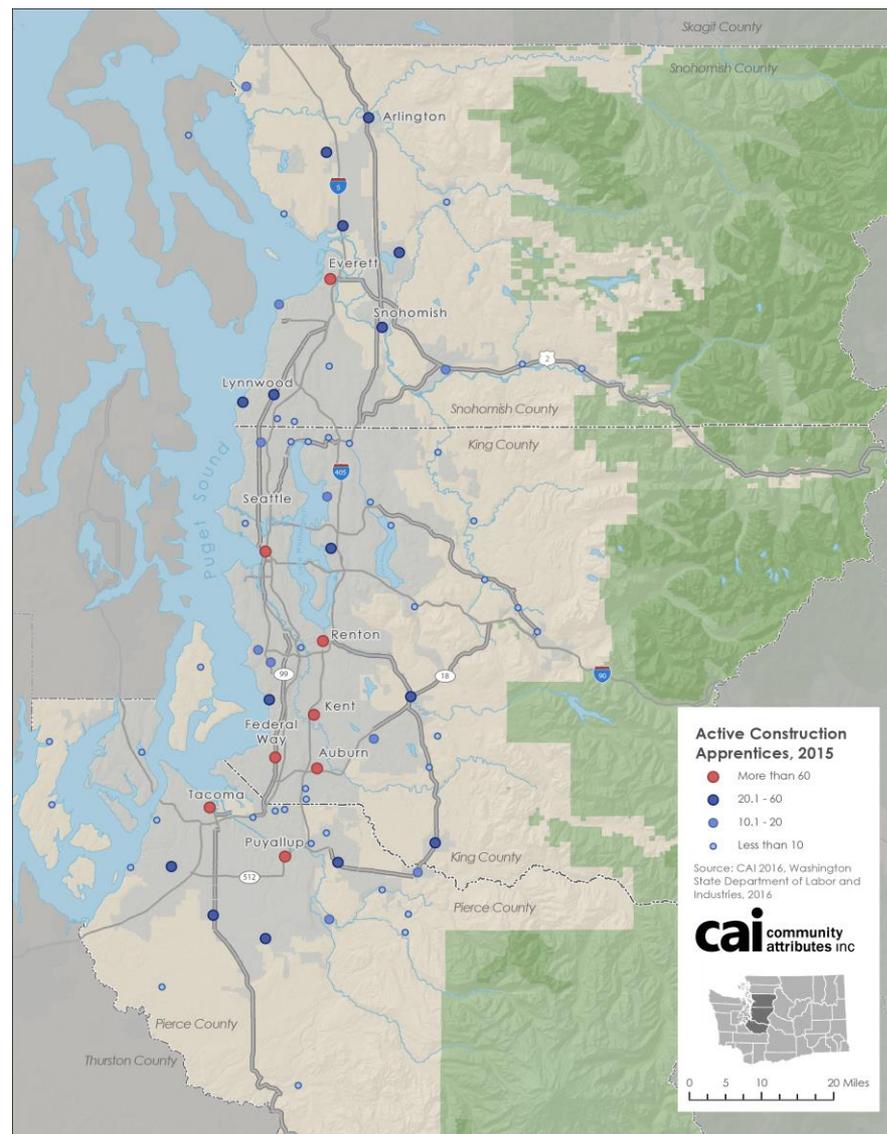
*Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.*

### ACTIVE CONSTRUCTION APPRENTICES

The region's construction apprentices can be found across King, Pierce, and Snohomish Counties. Large concentrations of apprentices live in the region's major cities, especially Seattle, Everett, Kent, Renton, Federal Way, Tacoma, and Puyallup.

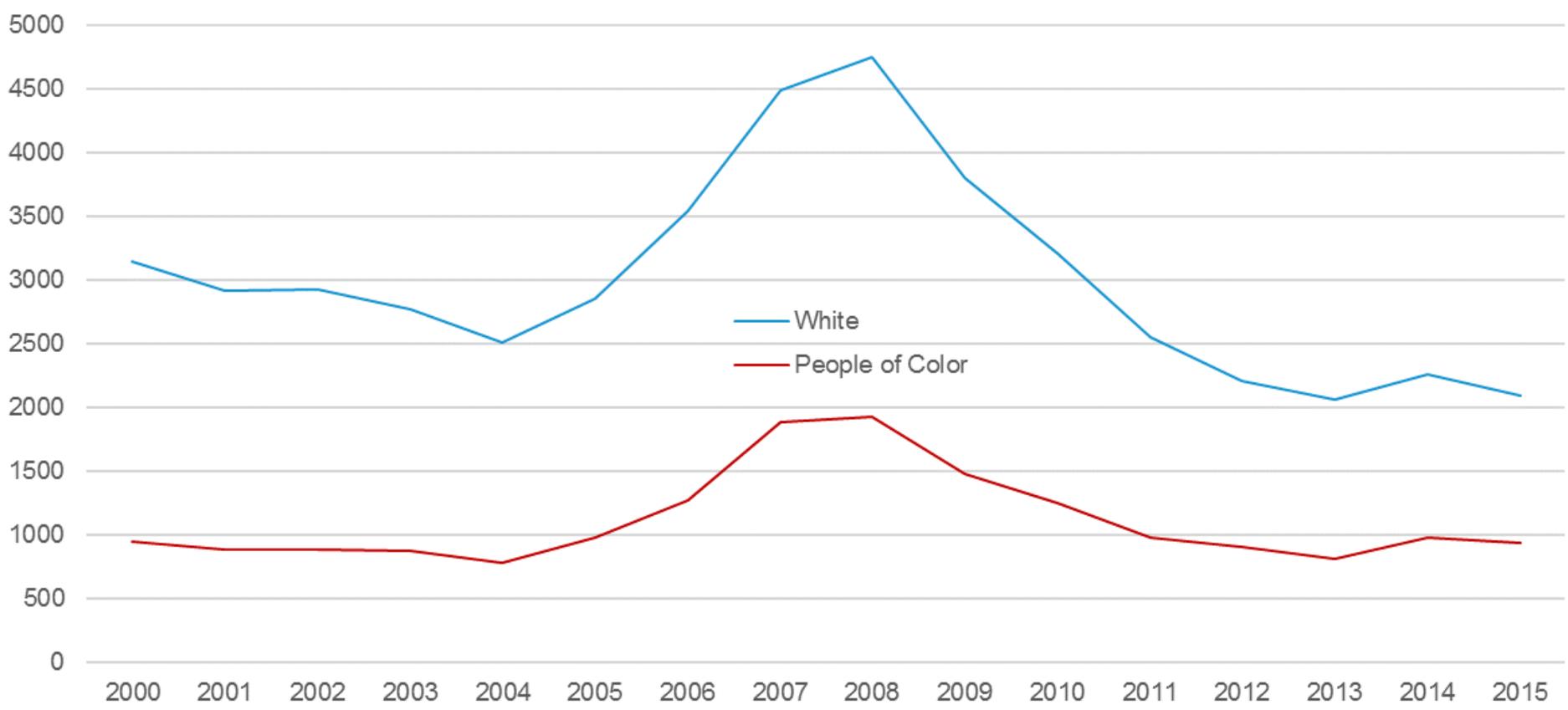
There are smaller numbers of active apprentices in other cities and neighborhoods across the region, with many clustered in areas adjacent to the region's major cities.

### EXHIBIT 6. ACTIVE CONSTRUCTION APPRENTICES, 2015



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

EXHIBIT 7. ACTIVE CONSTRUCTION APPRENTICES BY RACE; KING, PIERCE, AND SNOHOMISH COUNTIES; 2000-2015



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.  
 Note: the number of active apprentices does not include apprentices that completed or cancelled their apprenticeship during that year, but does include new registrations. Apprentices who did not report a race are not included in either line.

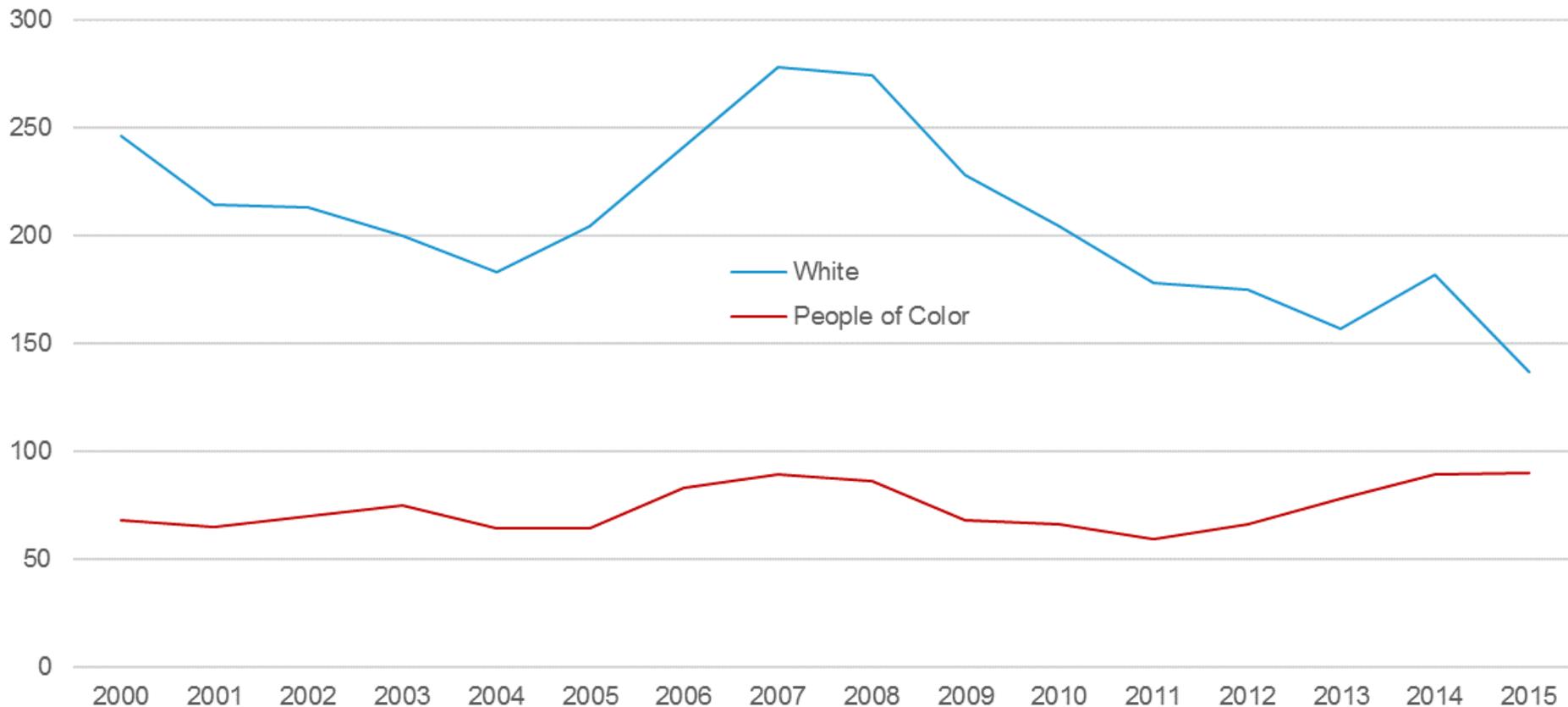
### EXHIBIT 8. ACTIVE CONSTRUCTION APPRENTICES BY RACE; KING, PIERCE, AND SNOHOMISH COUNTIES; 2000-2015

	Total														
	White		Black or African American		Hispanic		Asian		American Indian or Native Alaskan		Native Hawaiian or Other Pacific Islander		Unknown		Total
2000	3,146	75%	309	7%	351	8%	192	5%	97	2%	2	0%	118	3%	4,216
2001	2,922	75%	313	8%	326	8%	161	4%	83	2%	9	0%	103	3%	3,918
2002	2,929	75%	279	7%	352	9%	157	4%	88	2%	14	0%	107	3%	3,927
2003	2,778	74%	286	8%	349	9%	144	4%	87	2%	13	0%	76	2%	3,734
2004	2,516	75%	283	8%	279	8%	120	4%	84	3%	21	1%	49	1%	3,352
2005	2,854	74%	361	9%	328	8%	133	3%	115	3%	44	1%	43	1%	3,878
2006	3,542	73%	462	9%	440	9%	146	3%	158	3%	67	1%	54	1%	4,871
2007	4,495	70%	619	10%	758	12%	197	3%	195	3%	122	2%	61	1%	6,448
2008	4,760	70%	560	8%	844	12%	205	3%	199	3%	123	2%	67	1%	6,760
2009	3,803	71%	430	8%	633	12%	170	3%	153	3%	100	2%	54	1%	5,343
2010	3,212	71%	343	8%	529	12%	153	3%	142	3%	86	2%	43	1%	4,508
2011	2,560	72%	276	8%	384	11%	121	3%	121	3%	76	2%	30	1%	3,568
2012	2,215	70%	270	9%	349	11%	118	4%	98	3%	75	2%	22	1%	3,147
2013	2,070	71%	259	9%	304	10%	91	3%	99	3%	65	2%	19	1%	2,907
2014	2,267	69%	296	9%	398	12%	100	3%	97	3%	79	2%	21	1%	3,265
2015	2,093	68%	273	9%	371	12%	102	3%	104	3%	78	3%	67	2%	3,095
2000-2015															
Total Growth	-33%		-12%		6%		-47%		7%		NA		-43%		-27%
CAGR	-3%		-1%		0%		-4%		0%		NA		-4%		-2%

Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

Note: the number of active apprentices does not include apprentices that completed or cancelled their apprenticeship during that year, but does include new registrations.

EXHIBIT 9. ACTIVE FEMALE CONSTRUCTION APPRENTICES BY RACE; KING, PIERCE, AND SNOHOMISH COUNTIES; 2000-2015



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

Note: the number of active apprentices does not include apprentices that completed or cancelled their apprenticeship during that year, but does include new registrations. Apprentices who did not report a race are not included in either line.

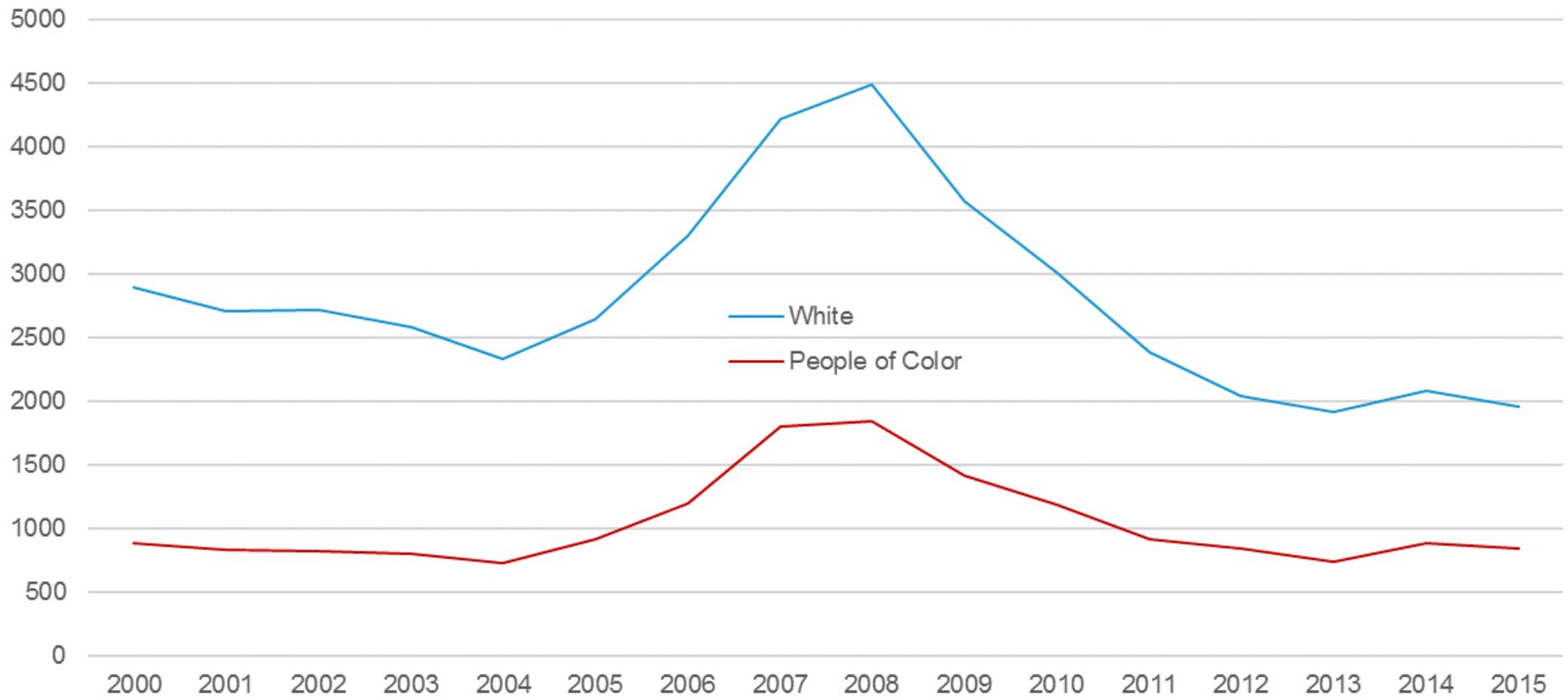
### EXHIBIT 10. ACTIVE FEMALE CONSTRUCTION APPRENTICES BY RACE; KING, PIERCE, AND SNOHOMISH COUNTIES; 2000-2015

Female															
	White	Black or African American		Hispanic		Asian		American Indian or Native Alaskan		Native Hawaiian or Other Pacific Islander		Unknown		Total	
2000	246	77%	29	9%	16	5%	12	4%	11	3%	-	0%	7	2%	321
2001	214	75%	26	9%	18	6%	11	4%	10	3%	-	0%	7	2%	286
2002	213	73%	25	9%	21	7%	8	3%	16	5%	-	0%	9	3%	292
2003	200	71%	38	14%	17	6%	5	2%	14	5%	1	0%	6	2%	281
2004	183	73%	23	9%	18	7%	7	3%	15	6%	1	0%	2	1%	249
2005	204	75%	19	7%	16	6%	10	4%	15	6%	4	1%	3	1%	271
2006	241	74%	31	9%	19	6%	9	3%	22	7%	2	1%	3	1%	327
2007	278	75%	33	9%	22	6%	11	3%	21	6%	2	1%	3	1%	370
2008	274	75%	23	6%	31	8%	8	2%	22	6%	2	1%	6	2%	366
2009	228	76%	22	7%	20	7%	6	2%	19	6%	1	0%	5	2%	301
2010	204	74%	20	7%	21	8%	6	2%	18	7%	1	0%	4	1%	274
2011	178	74%	18	7%	17	7%	7	3%	17	7%	-	0%	4	2%	241
2012	175	71%	22	9%	16	7%	12	5%	15	6%	1	0%	4	2%	245
2013	157	66%	31	13%	19	8%	12	5%	14	6%	2	1%	3	1%	238
2014	182	67%	38	14%	27	10%	7	3%	10	4%	5	2%	1	0%	272
2015	137	60%	44	19%	21	9%	7	3%	11	5%	7	3%	1	0%	228
2000-2015															
Total Growth	-44%		52%		31%		-42%		0%		NA		-86%		-29%
CAGR	-4%		3%		2%		-4%		0%		NA		-12%		-2%

Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

Note: the number of active apprentices does not include apprentices that completed or cancelled their apprenticeship during that year, but does include new registrations.

**EXHIBIT 11. ACTIVE MALE CONSTRUCTION APPRENTICES BY RACE; KING, PIERCE, AND SNOHOMISH COUNTIES; 2000-2015**



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

Note: the number of active apprentices does not include apprentices that completed or cancelled their apprenticeship during that year, but does include new registrations. Apprentices who did not report a race are not included in either line.

### EXHIBIT 12. ACTIVE MALE CONSTRUCTION APPRENTICES BY RACE; KING, PIERCE, AND SNOHOMISH COUNTIES; 2000-2015

	Male														
	White		Black or African American		Hispanic		Asian		American Indian or Native Alaskan		Native Hawaiian or Other Pacific Islander		Unknown		Total
2000	2,900	74%	280	7%	335	9%	180	5%	86	2%	2	0%	111	3%	3,895
2001	2,708	75%	287	8%	308	8%	150	4%	73	2%	9	0%	96	3%	3,632
2002	2,716	75%	254	7%	331	9%	149	4%	72	2%	14	0%	98	3%	3,635
2003	2,578	75%	248	7%	332	10%	139	4%	73	2%	12	0%	70	2%	3,453
2004	2,333	75%	260	8%	261	8%	113	4%	69	2%	20	1%	47	2%	3,103
2005	2,650	73%	342	9%	312	9%	123	3%	100	3%	40	1%	40	1%	3,607
2006	3,301	73%	431	9%	421	9%	137	3%	136	3%	65	1%	51	1%	4,544
2007	4,217	69%	586	10%	736	12%	186	3%	174	3%	120	2%	58	1%	6,078
2008	4,486	70%	537	8%	813	13%	197	3%	177	3%	121	2%	61	1%	6,394
2009	3,575	71%	408	8%	613	12%	164	3%	134	3%	99	2%	49	1%	5,042
2010	3,008	71%	323	8%	508	12%	147	3%	124	3%	85	2%	39	1%	4,234
2011	2,382	72%	258	8%	367	11%	114	3%	104	3%	76	2%	26	1%	3,327
2012	2,040	70%	248	9%	333	11%	106	4%	83	3%	74	3%	18	1%	2,902
2013	1,913	72%	228	9%	285	11%	79	3%	85	3%	63	2%	16	1%	2,669
2014	2,085	70%	258	9%	371	12%	93	3%	87	3%	74	2%	20	1%	2,993
2015	1,956	68%	229	8%	350	12%	95	3%	93	3%	71	2%	66	2%	2,867
2000-2015															
Total Growth	-33%		-18%		4%		-47%		8%		NA		-41%		-26%
CAGR	-3%		-1%		0%		-4%		1%		NA		-3%		-2%

Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

Note: the number of active apprentices does not include apprentices that completed or cancelled their apprenticeship during that year, but does include new registrations.

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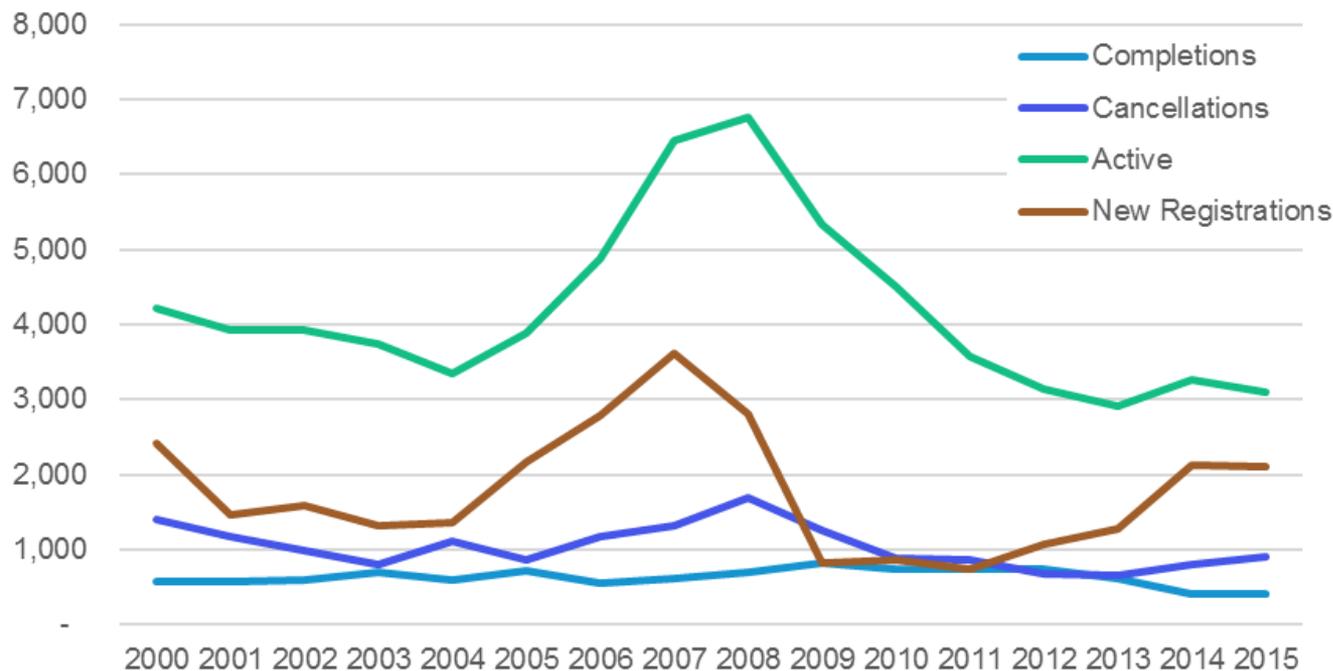
Construction apprenticeships in Pierce, King, and Snohomish Counties underwent two major changes from 2000 to 2015 in terms of apprentices statuses. In the middle part of this time period, roughly from 2005 to 2007, active apprenticeships (which includes new registrations) increased rapidly. At the onset of the great recession, there was an uptick in the number of cancellations, and active apprentices dropped. New registrations dropped to the lowest levels seen during this time period.

As the region began to recover, so did apprenticeships. By 2013, the number of new registrations had begun to increase, and the downward trend in active apprentices reversed. In 2015, the number of new registrations reached 2005 levels.

With increasing registrations and relatively low levels of cancellations, the region is on track to expand its apprenticeship talent pool in the coming years.

## EXHIBIT 13. CONSTRUCTION APPRENTICESHIP KEY METRICS

King, Pierce, and Snohomish Counties; 2000-2015



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

Note: the number of active apprentices does not include apprentices that completed or cancelled their apprenticeship during that year, but does include new registrations.

Cancellation and completion rates are defined as the number of cancellations or completions divided by cancellations, completions, transfers, and suspensions.

Over the past 15 years, construction apprenticeship completion and cancellation rates have largely had an inverse relationship: when the completion rate increases, the cancellation rate decreases; when the cancellation rate increases, the completion rate decreases. This indicates that, to some degree, the rate at which apprentices leave their programs is roughly consistent over time.

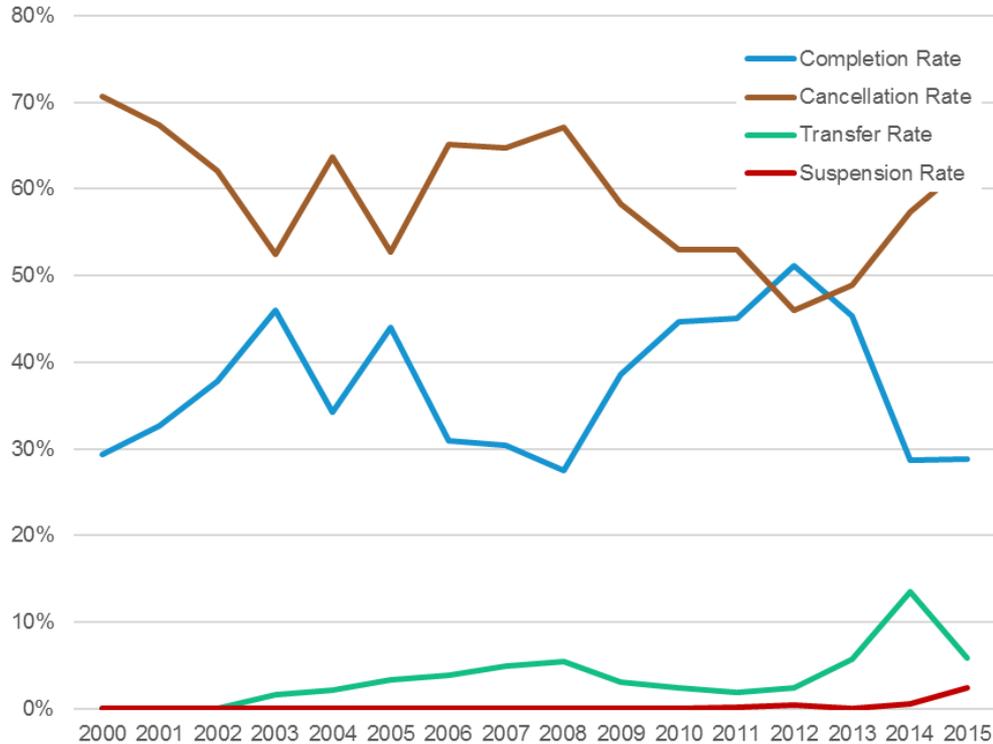
Cancellations can be made at the request of the apprentice, supervisor, or sponsor. For example, an apprentice could receive a job offer in another industry while he or she is still an apprentice, and decide to take that job instead of completing his or her program.

In recent years, the completion and cancellation rates in King, Pierce, and Snohomish County region trended towards the pre-recession rates.

Transfer and suspensions have historically had very low rates compared to completions and cancellations. In 2014, however, the transfer rate reached 13%, a historic high.

#### EXHIBIT 14. CONSTRUCTION APPRENTICESHIP COMPLETION AND CANCELLATION RATES

King, Pierce, and Snohomish Counties; 2000-2015



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

#### CONSTRUCTION APPRENTICESHIP STATUS BY GENDER

In general, construction apprenticeship statuses were largely similar for male and female workers on average during the 2011-2015 period. **Exhibit 15** describes the shares of completions, cancellations, transfers, and suspensions. Together, these four metrics sum to 100% for each gender.

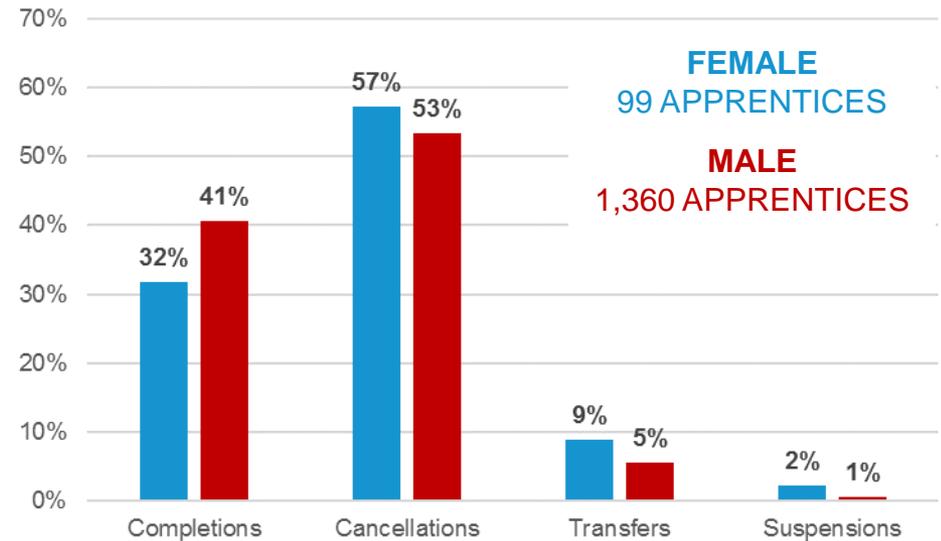
During this period, an average of 31 female apprentices completed their programs, 57 cancelled their programs, 9 transferred, and 2 suspended their programs. These sum to a total of 99 apprentices.

On average, 552 male apprentices completed their programs per year during the 2011-2015 period, 725 cancelled their programs, 75 transferred, and 8 suspended their programs. These sum to a total of 1,360 apprentices.

In this period, the share of suspended or transferred apprentices was higher for female workers than for male workers, 11% for female workers (or an average of 11 apprentices per year) compared to 7% for male workers (or an average of 83 apprentice per year).

#### EXHIBIT 15. CONSTRUCTION APPRENTICESHIP STATUS BY GENDER

King, Pierce, and Snohomish Counties; 2011-2015 average



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

#### CONSTRUCTION APPRENTICESHIP STATUS BY RACE

From 2011 through 2015, the share of apprentices that completed their programs was lower for people of color in King, Pierce, and Snohomish Counties than it was for white apprentices, 33% for people of color (or an average of 155 apprentices per year) compared to 43% for white apprentices (or an average of 428 apprentices per year).

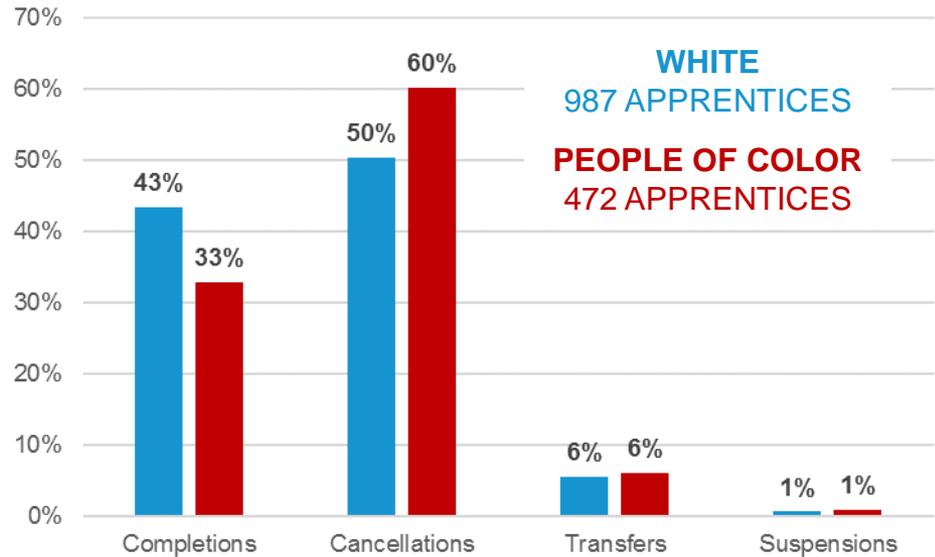
At the same time, the cancellation rate for people of color was higher than it was for white apprentices, 60% compared to 50% (or an average of 284 apprentices who were people of color compared to an average of 497 apprentices who were white).

Overall, an annual average of 428 white apprentices completed their programs from 2011 to 2015, 498 cancelled their programs, 55 transferred, and 6 suspended their programs.

During the same period, an annual average of 155 apprentices of color completed their programs, 284 cancelled their programs, 29 transferred, and 4 suspended their programs.

#### EXHIBIT 16. CONSTRUCTION APPRENTICESHIP STATUS BY RACE

King, Pierce, and Snohomish Counties; 2011-2015 average



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

## CONSTRUCTION APPRENTICESHIP STATUS BY RACE

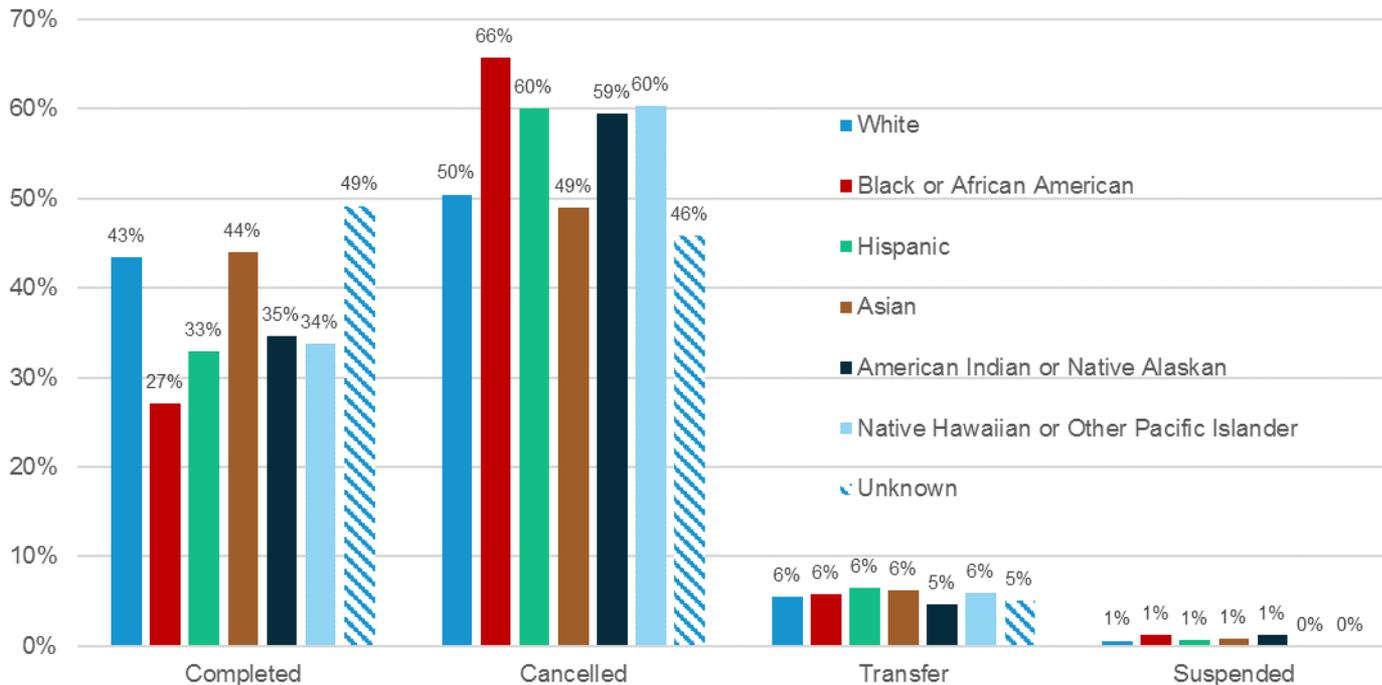
Looking more closely at detailed breakouts of construction apprenticeship status by race reveals several important observations. **Exhibit 17** indicates the status of apprentices by race from 2011 through 2015. The sum of the share of completions, cancellations, transfers, and suspensions totals 100% for each race.

In King, Pierce, and Snohomish Counties, there was notable variation in the statuses of apprentices by race. The race with the highest number of completions was white with 428 average annual completions. However, this represents a completion rate of 43%, lower than the rate for Asian apprentices (44%). The race with the lowest share of completions was black or African American with 27% completions (37 average annual completions).

Cancellations also showed significant variation: black or African American apprentices had the highest cancellation rate at 66% (90 average annual apprentices) and Asian apprentices had the lowest at 49% (24 average annual apprentices).

### EXHIBIT 17. CONSTRUCTION APPRENTICESHIP STATUS BY RACE

King, Pierce, and Snohomish Counties, 2011-2015 average



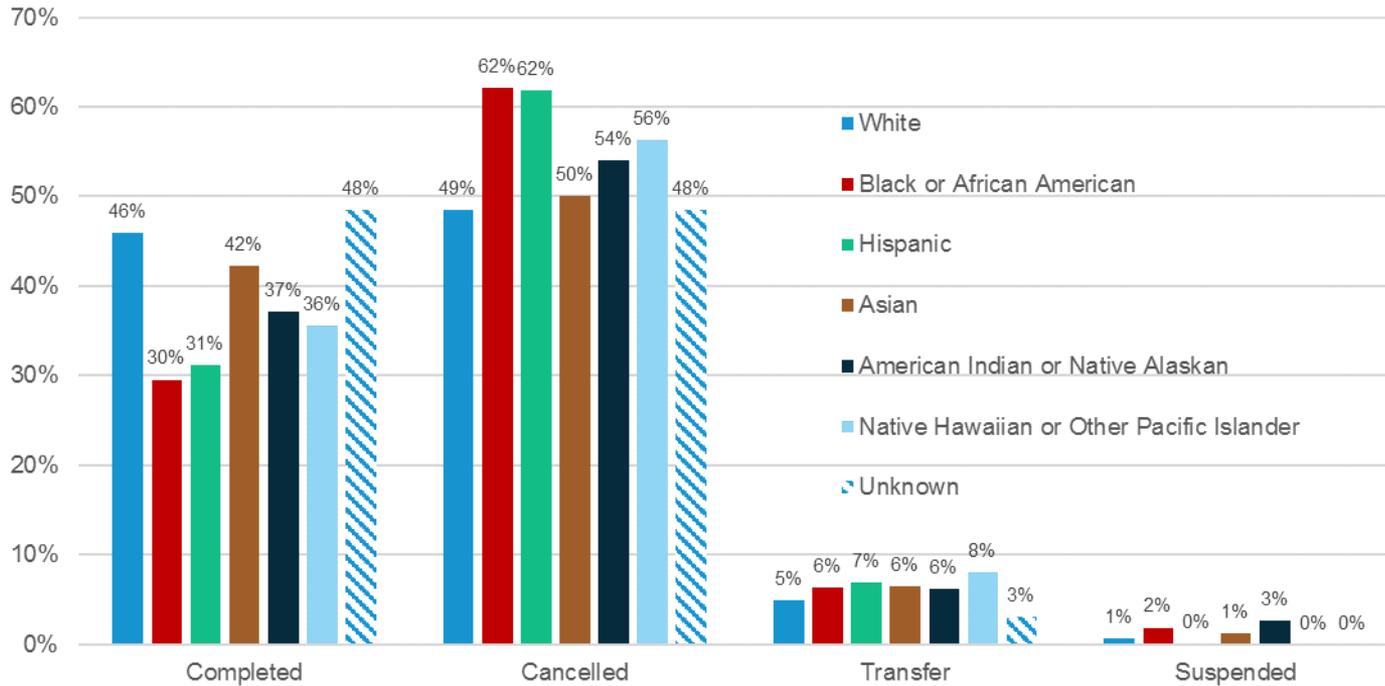
Sources: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

## CONSTRUCTION APPRENTICESHIP STATUS BY RACE

The statuses of apprentices by race in King County largely matched the statuses seen in the broader geographic area of King, Pierce, and Snohomish Counties. As in the previous exhibit, the sum of the share of completions, registrations, cancellations, and transfers or suspensions by race totals 100%.

### EXHIBIT 18. CONSTRUCTION APPRENTICESHIP STATUS BY RACE

King County, 2011-2015 average



Sources: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

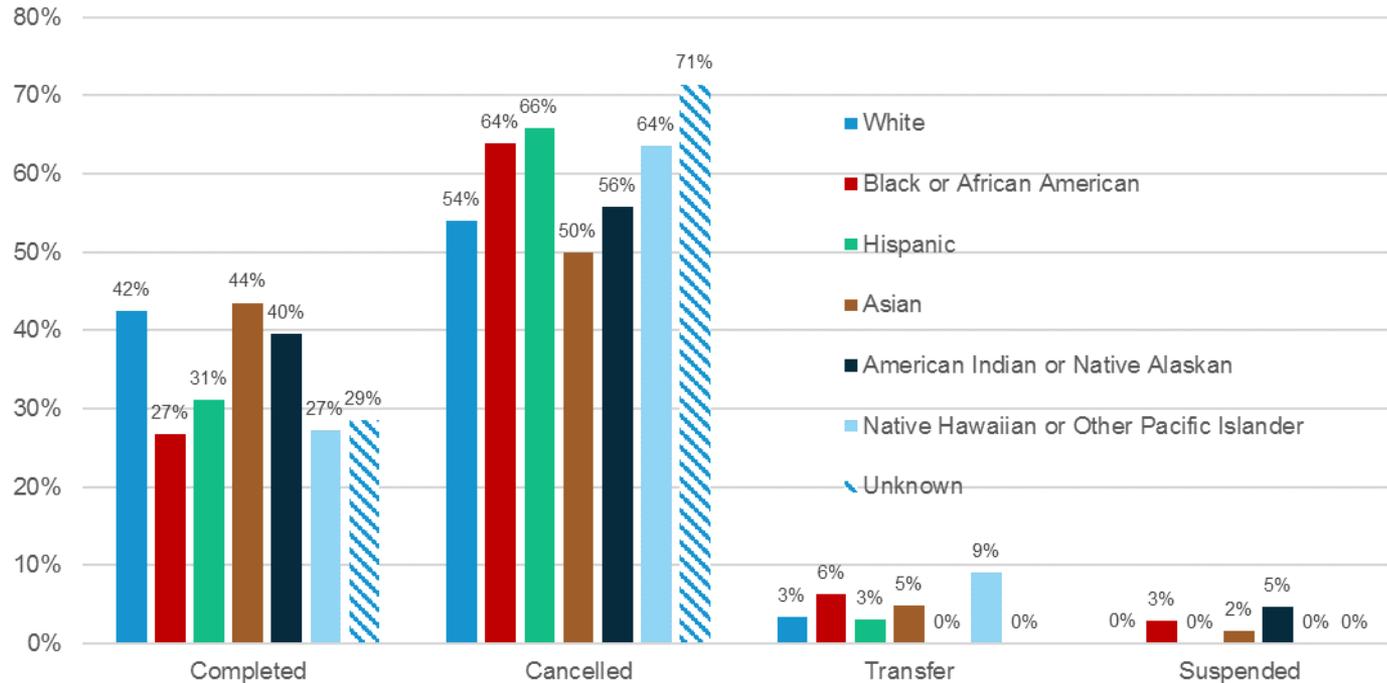
#### CONSTRUCTION APPRENTICESHIP STATUS BY RACE

In 2015, construction apprentices in Seattle showed significant variation in status by race. The transfer and suspension rates were lower in Seattle than they were in either King County or the broader geography or King, Pierce, and Snohomish Counties.

As in the previous exhibit, the sum of the share of completions, registrations, cancellations, and transfers or suspensions by race totals 100%.

#### EXHIBIT 19. CONSTRUCTION APPRENTICESHIP STATUS BY RACE

Seattle, 2011-2015 average



Sources: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

## NEW REGISTRATIONS BY RACE

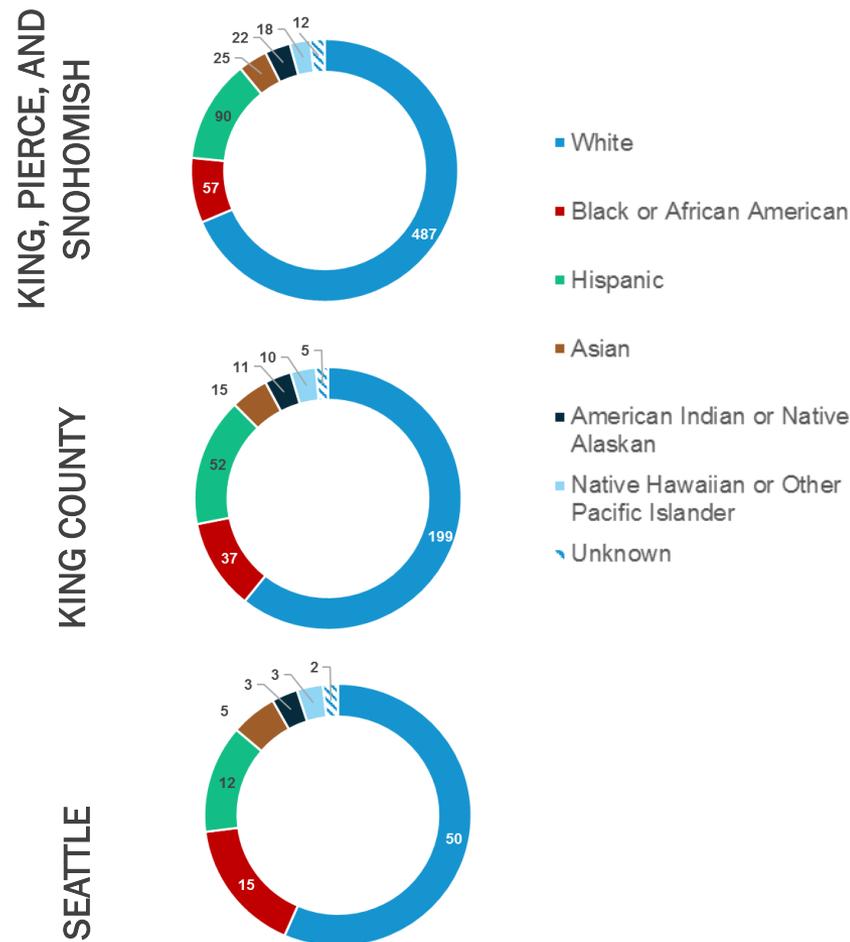
From 2011 through 2015, the race with the highest annual average registrations in construction occupations in King, Pierce, and Snohomish Counties was white with 487 average annual registrations. The next-largest race was Hispanic with 90 average annual registrations, followed by black or African American with 57 average annual registrations.

King County showed a similar trend, with 199 average annual new registrations from white apprentices, 52 from Hispanic apprentices, and 37 from black or African American apprentices.

Within Seattle, the breakdown was slightly different, with 50 average annual registrations from white apprentices, 15 from black or African American apprentices, and 12 from Hispanic apprentices.

## EXHIBIT 20. NEW REGISTRATIONS BY RACE

King, Pierce, and Snohomish Counties; King County; and Seattle; 2011-2015 average



Sources: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

## CONSTRUCTION APPRENTICESHIP COMPLETIONS AND COMPLETION TIMES

This analysis focuses on Laborers, Carpenters, and Electricians. These three crafts are forecasted to have the highest demand in the coming years for further detail on these forecasts, please see the March 2016 Sound Transit Construction Workforce Analysis.

On average, apprentices who finished their programs some time from 2011 to 2015 took just under 5 years (57.2 months) to complete their programs. Laborers took, on average, 1.5 years (18.0 months) longer than expected to complete their apprenticeships. Electricians took 14.8 months longer than expected to complete their apprenticeships, and carpenters took 6.3 months longer than expected.

## EXHIBIT 21. CONSTRUCTION APPRENTICESHIP EXPECTED AND ACTUAL COMPLETION TIMES (MONTHS)

King, Pierce, and Snohomish Counties, 2011-2015 average

	Expected Completion Time	Actual Completion Time	Difference
Laborers	25.9	43.9	18.0
Carpenters	47.9	54.2	6.3
Electricians	47.5	62.3	14.8
Other Construction Apprenticeships	45.0	57.2	12.2
Construction Apprenticeships	44.9	57.1	12.3

-  Low difference between expected and actual completion times.
-  High difference between expected and actual completion times.

Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

## CANCELLATION RATES BY TRADE AND GENDER

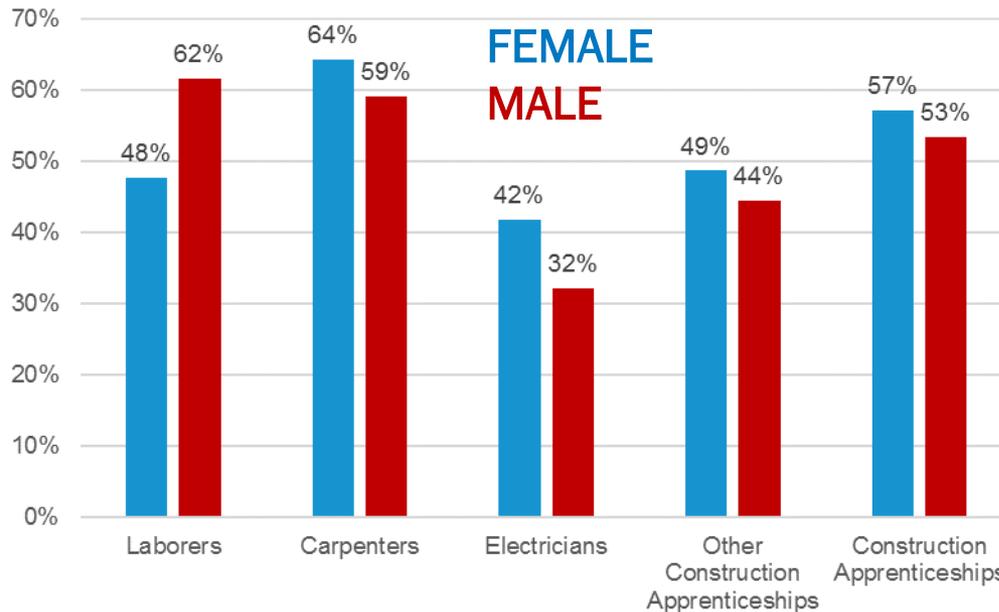
Looking at cancellation rates more closely by trade and gender helps further describe the demographic differences of construction apprentices in King, Pierce, and Snohomish Counties.

On average, male laborer apprentices had higher cancellation rates than female apprentices from 2011 through 2015: 62% for male apprentices (94 cancellations on average) compared to 48% for female apprentices (8 female cancellations on average).

For carpenter apprentices and electricians, the reverse was true: male apprentices had lower cancellation rates than their female counterparts. Across all construction apprenticeships, female construction apprentices had a slightly higher cancellation rate than their male counterparts: 57% (or 57 average annual cancellations) compared to 53% (or 725 average annual cancellations).

### EXHIBIT 22. CONSTRUCTION APPRENTICESHIP CANCELLATION RATES BY TRADE AND GENDER

King, Pierce, and Snohomish Counties, 2011-2015 average



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

#### ACTUAL AND EXPECTED COMPLETION TIME (MONTHS) BY GENDER

Comparing actual construction apprenticeship completion times with expected completion times by gender provides further detail into the differences between male and female construction apprentices.

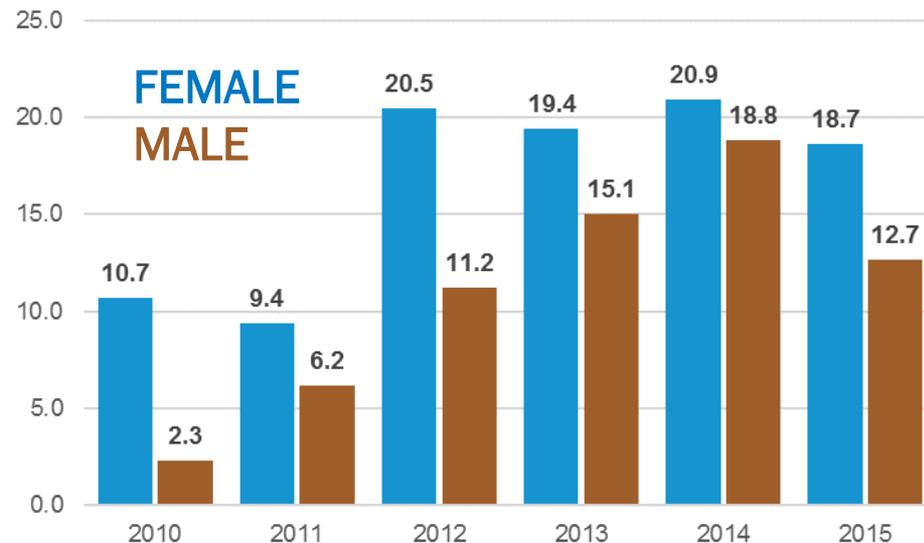
Expected completion times are defined at the apprentice level as the full-time equivalent term of the apprenticeship. For example, an apprentice in a 4,000-hour program would have an expected completion time of roughly two years. If the apprentice took three calendar years to complete the 4,000-hour program, the difference between actual and expected completion times would be one year. The differences between expected and actual completion times for apprentices who completed their respective programs in a given calendar year are then averaged, resulting in the values in **Exhibit 23**.

From 2010 to 2015, the difference between actual and expected completion times for both male and female construction apprenticeships has increased. While male construction apprentices had a lower average difference between actual and estimated completion times in 2010, the gap between the two genders has begun to narrow.

From 2010 to 2015, between 56 and 93 female construction apprentices completed their respective programs per year. Between 556 and 1,012 male apprentices completed their programs per year.

#### EXHIBIT 23. DIFFERENCE BETWEEN ACTUAL AND EXPECTED COMPLETION TIME (MONTHS) BY GENDER

King, Pierce, and Snohomish Counties, 2010-2015



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

#### ACTUAL AND EXPECTED COMPLETION TIME (MONTHS) BY RACE

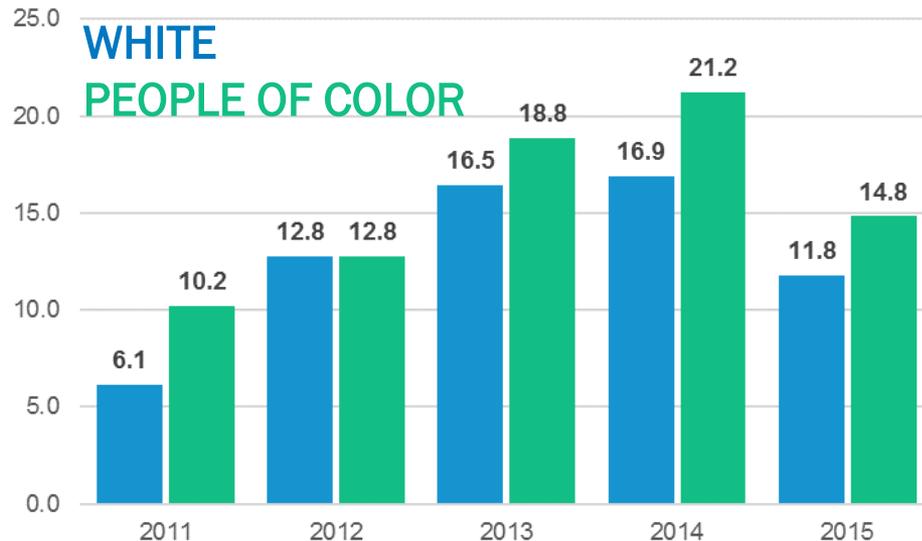
The same metric can be used to compare white apprentices and apprentices who identified as people of color.

To a large degree, white apprentices and apprentices of color had very similar differences between actual and expected completion times, with people of color averaging slightly higher than their white counterparts. This difference was the greatest in 2014, where white apprentices who completed programs took an average of 16.9 months longer than expected to complete their apprenticeships compared to 21.2 months for people of color.

From 2011 to 2015, between 159 and 285 apprentices of color completed their respective programs per year, compared to between 445 and 816 for white construction apprentices.

#### EXHIBIT 24. DIFFERENCE BETWEEN ACTUAL AND EXPECTED COMPLETION TIME (MONTHS) BY RACE

King, Pierce, and Snohomish Counties 2011-2015



Source: Washington State Department of Labor and Industries, 2016; Community Attributes Inc., 2016.

# OUTLINE

## 1 INFORMATION AND BACKGROUND

- Background
- Research Questions
- Terms and Concepts

## 2 CURRENT DEMOGRAPHIC CHARACTERISTICS

- Race, Ethnicity, Gender, and Place of Residence
- Breakouts for Electrician, Carpenter, and Laborer Apprentices

## 3 COMPLETIONS AND CANCELLATIONS

- Race, Ethnicity, Gender, and Place of Residence
- Breakouts for Electrician, Carpenter, and Laborer Apprentices

## 4 MAJOR TAKEAWAYS

### RACE

On average, **King, Pierce, and Snohomish Counties had 921 construction apprentices of color from 2011 through 2015** (29% of active apprentices). The region also had an additional 2,241 white construction apprentices (70% of active apprentices).

Apprentices of color took longer, on average, to complete their respective apprenticeship programs from 2010 through 2015.

From 2011 through 2015, an annual average of 284 apprentices of color cancelled their apprenticeships (60% of apprentices of color), compared to 498 for white apprentices (50% of white apprentices).

### GENDER

In King, Pierce, and Snohomish Counties, an average of 245 apprentices per year were female from 2011-2015. There were, on average, 2,952 male apprentices per year during the same period.

On average, **female construction apprentices took longer to complete their respective apprenticeship programs than their male counterparts.**

From 2011 through 2015, an average of 57 female apprentices cancelled their apprenticeships per year, compared to 725 for male apprentices.

### TRADE

Laborers, carpenters, and electricians are three of the most in-demand occupations in King, Pierce, and Snohomish Counties. On average, there were 147 active electrician apprentices per year, 107 active laborer apprentices per year, and 87 active carpenter apprentices per year from 2011-2015.

Laborers who completed their programs during this period took, on average, 18 months longer to complete their programs than expected. Electricians took 14.8 months longer than expected, on average, and carpenters took 6.3 months longer than expected.

# APPENDIX

## **1 APPRENTICE COMPLETIONS**

- Average annual completions and Completion and Cancellation rates by trade, gender, and race for apprenticeship programs.

## **2 APPRENTICES IN PRIORITY ZIP CODES**

- Average annual active apprentices by trade, gender, and race.

February 2017

## EXHIBIT A-1. APPRENTICE COMPLETIONS

King, Pierce, and Snohomish Counties; 2011-2015 Annual Averages

Program	Trade	All Apprentices			Priority Hire ZIP Codes		
		Average Completions	Completion Rate	Cancellation Rate	Average Completions	Completion Rate	Cancellation Rate
All	All Trades	598.6	40%	53%	158.6	39%	55%
CITC	All Trades	32.0	33%	59%	7.2	26%	64%
Other Programs	All Trades	566.6	41%	53%	151.4	39%	54%
CITC	Electricians	11.6	36%	51%	2.2	31%	47%
Other Programs	Electricians	143.0	64%	30%	36.0	67%	27%
CITC	Carpenters	11.4	32%	64%	2.6	22%	73%
Other Programs	Carpenters	67.4	39%	58%	16.0	32%	63%
CITC	Plumbers, Pipefitters, and Steamfitters	4.8	39%	52%	0.8	40%	60%
Other Programs	Plumbers, Pipefitters, and Steamfitters	61.8	63%	34%	23.2	67%	29%
CITC	Construction Laborers	0.0	0%	50%	0.0	0%	0%
Other Programs	Construction Laborers	57.6	34%	60%	14.4	30%	62%
CITC	HVAC Installers and Repairers	1.8	36%	56%	0.6	38%	50%
Other Programs	HVAC Installers and Repairers	13.2	72%	27%	4.6	70%	30%
CITC	Sheet Metal Workers	0.6	43%	43%	0.0	0%	0%
Other Programs	Sheet Metal Workers	45.2	57%	39%	8.8	65%	32%
CITC	Operating Engineers and Other Construction Equipment Operators	0.8	29%	57%	0.2	20%	80%
Other Programs	Operating Engineers and Other Construction Equipment Operators	15.6	52%	34%	1.8	47%	37%
CITC	Painters, Construction and Maintenance	1.0	14%	86%	0.8	22%	78%
Other Programs	Painters, Construction and Maintenance	9.0	11%	83%	5.0	17%	76%
	Structural Iron and Steel Workers	34.4	43%	55%	10.0	45%	54%
	Drywall and Ceiling Tile Installers	25.0	27%	51%	6.8	23%	58%
	Glaziers	15.8	64%	31%	4.0	65%	35%
	Roofers	14.2	15%	83%	3.6	13%	85%
	Elevator Installers and Repairers	11.6	29%	68%	1.8	21%	79%
	Cement Masons and Concrete Finishers	9.6	25%	73%	2.8	26%	72%
	Brickmasons and Blockmasons	6.8	33%	55%	1.6	32%	60%
	Boilemakers	6.6	46%	47%	2.4	50%	46%
	Insulation Workers, Mechanical	5.4	47%	49%	1.2	50%	50%
	Pipelayers	4.0	100%	0%	1.4	100%	0%
	Insulation Workers, Floor, Ceiling, and Wall	3.6	53%	44%	0.6	75%	25%
	Tapers	3.4	13%	63%	1.0	10%	69%
	Carpet Installers	3.0	25%	75%	0.8	36%	64%
	Construction and Related Workers, All Other	2.8	33%	62%	0.4	22%	67%
	Plasterers and Stucco Masons	2.4	23%	71%	0.6	19%	75%
	Helpers—Masons and Tile and Marble Setters	1.8	11%	83%	1.0	17%	77%
	Tile and Marble Setters	1.6	26%	68%	0.8	44%	56%
	Stonemasons	0.8	36%	45%	0.4	100%	0%
	Terrazzo Workers and Finishers	0.8	44%	56%	0.4	33%	67%
	Surveyors	0.2	17%	50%	0.0	0%	100%

## EXHIBIT A-2. APPRENTICE COMPLETIONS BY TRADE AND GENDER

King, Pierce, and Snohomish Counties; 2011-2015 Annual Averages

Program	Trade	Female			Male		
		Average Completions	Completion Rate	Cancellation Rate	Average Completions	Completion Rate	Cancellation Rate
All	All Trades	31.4	32%	57%	567.2	41%	53%
CITC	All Trades	0.4	7%	79%	31.6	34%	57%
Other Programs	All Trades	31.0	33%	56%	535.6	41%	53%
CITC	Electricians	0.2	9%	82%	11.4	38%	49%
Other Programs	Electricians	9.4	59%	36%	133.6	64%	30%
CITC	Carpenters	0.0	0%	63%	11.4	34%	64%
Other Programs	Carpenters	3.6	30%	63%	63.8	40%	57%
CITC	Plumbers, Pipefitters, and Steamfitters	0.2	33%	67%	4.6	39%	51%
Other Programs	Plumbers, Pipefitters, and Steamfitters	1.4	35%	50%	60.4	64%	33%
CITC	Construction Laborers	0.0	0%	0%	0.0	0%	50%
Other Programs	Construction Laborers	6.8	40%	48%	50.8	33%	62%
CITC	HVAC Installers and Repairers	0.0	0%	100%	1.8	38%	54%
Other Programs	HVAC Installers and Repairers	0.0	0%	0%	13.2	72%	27%
CITC	Sheet Metal Workers	0.0	0%	0%	0.6	43%	43%
Other Programs	Sheet Metal Workers	1.8	26%	65%	43.4	60%	36%
CITC	Operating Engineers and Other Construction Equipment Operators	0.0	0%	100%	0.8	31%	54%
Other Programs	Operating Engineers and Other Construction Equipment Operators	2.2	55%	25%	13.4	52%	35%
CITC	Painters, Construction and Maintenance	0.0	0%	100%	1.0	15%	85%
Other Programs	Painters, Construction and Maintenance	0.6	11%	86%	8.4	12%	83%
	Structural Iron and Steel Workers	1.4	27%	65%	33.0	45%	54%
	Drywall and Ceiling Tile Installers	0.0	0%	56%	25.0	27%	51%
	Glaziers	0.8	67%	17%	15.0	64%	32%
	Roofers	0.0	0%	100%	14.2	15%	82%
	Elevator Installers and Repairers	0.0	0%	100%	11.6	30%	67%
	Cement Masons and Concrete Finishers	0.4	14%	71%	9.2	25%	73%
	Brickmasons and Blockmasons	0.2	25%	50%	6.6	34%	55%
	Boilemakers	1.0	56%	44%	5.6	44%	48%
	Insulation Workers, Mechanical	0.2	33%	67%	5.2	48%	48%
	Pipelayers	0.6	100%	0%	3.4	100%	0%
	Insulation Workers, Floor, Ceiling, and Wall	0.2	100%	0%	3.4	52%	45%
	Tapers	0.2	9%	36%	3.2	14%	65%
	Carpet Installers	0.2	50%	50%	2.8	24%	76%
	Construction and Related Workers, All Other	0.0	0%	80%	2.8	38%	59%
	Plasterers and Stucco Masons	0.0	0%	83%	2.4	26%	70%
	Helpers—Masons and Tile and Marble Setters	0.0	0%	100%	1.8	12%	82%
	Tile and Marble Setters	0.0	0%	0%	1.6	26%	68%
	Stonemasons	0.0	0%	100%	0.8	40%	40%
	Terrazzo Workers and Finishers	0.0	0%	0%	0.8	44%	56%
	Surveyors	0.0	0%	100%	0.2	25%	25%

## EXHIBIT A-3. APPRENTICE COMPLETIONS BY TRADE AND RACE

King, Pierce, and Snohomish Counties; 2011-2015 Annual Averages

Program	Trade	White			People of Color		
		Average Completions	Completion Rate	Cancellation Rate	Average Completions	Completion Rate	Cancellation Rate
All	All Trades	441.8	44%	50%	156.8	33%	60%
CITC	All Trades	20.6	34%	58%	11.4	31%	59%
Other Programs	All Trades	421.2	44%	50%	145.4	33%	60%
CITC	Electricians	8.4	36%	52%	3.2	36%	49%
Other Programs	Electricians	117.4	66%	28%	25.6	54%	38%
CITC	Carpenters	5.0	29%	69%	6.4	36%	58%
Other Programs	Carpenters	48.2	43%	54%	19.2	32%	64%
CITC	Plumbers, Pipefitters, and Steamfitters	4.4	47%	49%	0.4	13%	60%
Other Programs	Plumbers, Pipefitters, and Steamfitters	50.8	66%	30%	11.0	50%	45%
CITC	Construction Laborers	0.0	0%	0%	0.0	0%	50%
Other Programs	Construction Laborers	37.0	33%	61%	20.6	36%	58%
CITC	HVAC Installers and Repairers	1.8	50%	44%	0.0	0%	86%
Other Programs	HVAC Installers and Repairers	11.6	72%	27%	1.6	73%	27%
CITC	Sheet Metal Workers	0.2	20%	60%	0.4	100%	0%
Other Programs	Sheet Metal Workers	37.6	59%	38%	7.6	49%	42%
CITC	Operating Engineers and Other Construction Equipment Operators	0.6	43%	29%	0.2	14%	86%
Other Programs	Operating Engineers and Other Construction Equipment Operators	12.4	54%	35%	3.2	46%	29%
CITC	Painters, Construction and Maintenance	0.2	5%	95%	0.8	22%	78%
Other Programs	Painters, Construction and Maintenance	4.0	9%	86%	5.0	15%	79%
	Structural Iron and Steel Workers	23.2	43%	55%	11.2	44%	55%
	Drywall and Ceiling Tile Installers	15.4	28%	45%	9.6	24%	59%
	Glaziers	11.8	66%	30%	4.0	61%	33%
	Roofers	6.2	14%	83%	8.0	15%	82%
	Elevator Installers and Repairers	10.2	31%	65%	1.4	21%	79%
	Cement Masons and Concrete Finishers	6.2	25%	74%	3.4	23%	73%
	Brickmasons and Blockmasons	4.4	31%	57%	2.4	40%	50%
	Boilemakers	4.8	47%	47%	1.8	43%	48%
	Insulation Workers, Mechanical	3.6	46%	49%	1.8	50%	50%
	Pipelayers	2.8	100%	0%	1.2	100%	0%
	Insulation Workers, Floor, Ceiling, and Wall	2.8	54%	42%	0.8	50%	50%
	Tapers	2.4	18%	49%	1.0	8%	78%
	Carpet Installers	2.2	24%	76%	0.8	27%	73%
	Construction and Related Workers, All Other	1.8	30%	63%	1.0	42%	58%
	Plasterers and Stucco Masons	0.8	18%	77%	1.6	27%	67%
	Helpers—Masons and Tile and Marble Setters	1.0	10%	85%	0.8	11%	80%
	Tile and Marble Setters	1.4	29%	71%	0.2	14%	57%
	Stonemasons	0.8	36%	45%	0.0	0%	0%
	Terrazzo Workers and Finishers	0.2	25%	75%	0.6	60%	40%
	Surveyors	0.2	25%	50%	0.0	0%	50%

## EXHIBIT A-4. ACTIVE APPRENTICES BY PRIORITY ZIP CODE STATUS, TRADE, GENDER, AND RACE

King, Pierce, and Snohomish Counties; 2015 Apprentices

Trade Desc	Program	ZIP	All Apprentices		Female		Male		White		People of Color	
			Active	Share of Active	Active	Share of Active	Active	Share of Active	Active	Share of Active	Active	Share of Active
All Trades	All Programs	All ZIP Codes	3121	100%	229	7%	2892	93%	2118	68%	1003	32%
		Priority Hire ZIP Codes	801	26%	81	35%	720	25%	402	19%	399	40%
		Other ZIP Codes	2320	74%	148	65%	2172	75%	1716	81%	604	60%
Electricians	CITC	Priority Hire ZIP Codes	14	18%	0	0%	14	18%	3	4%	11	14%
	CITC	Other ZIP Codes	64	82%	3	4%	61	78%	49	63%	15	19%
	Other Programs	Priority Hire ZIP Codes	147	27%	12	2%	135	25%	92	17%	55	10%
	Other Programs	Other ZIP Codes	402	73%	22	4%	380	69%	335	61%	67	12%
Carpenters	CITC	Priority Hire ZIP Codes	21	33%	6	10%	15	24%	6	10%	15	24%
	CITC	Other ZIP Codes	42	67%	2	3%	40	63%	26	41%	16	25%
	Other Programs	Priority Hire ZIP Codes	122	24%	16	3%	106	21%	63	13%	59	12%
	Other Programs	Other ZIP Codes	381	76%	26	5%	355	71%	305	61%	76	15%
Construction Laborers	CITC	Priority Hire ZIP Codes	3	27%	1	9%	2	18%	1	9%	2	18%
	CITC	Other ZIP Codes	8	73%	1	9%	7	64%	5	45%	3	27%
	Other Programs	Priority Hire ZIP Codes	111	31%	10	3%	101	28%	39	11%	72	20%
	Other Programs	Other ZIP Codes	250	69%	23	6%	227	63%	175	48%	75	21%
Painters, Construction and Maintenance	CITC	Priority Hire ZIP Codes	4	50%	0	0%	4	50%	0	0%	4	50%
	CITC	Other ZIP Codes	4	50%	1	13%	3	38%	1	13%	3	38%
	Other Programs	Priority Hire ZIP Codes	26	26%	5	5%	21	21%	14	14%	12	12%
	Other Programs	Other ZIP Codes	75	74%	4	4%	71	70%	51	50%	24	24%
Sheet Metal Workers	CITC	Priority Hire ZIP Codes	2	17%	0	0%	2	17%	2	17%	0	0%
	CITC	Other ZIP Codes	10	83%	0	0%	10	83%	7	58%	3	25%
	Other Programs	Priority Hire ZIP Codes	28	19%	7	5%	21	14%	21	14%	7	5%
	Other Programs	Other ZIP Codes	123	81%	15	10%	108	72%	101	67%	22	15%
Operating Engineers and Other Construction Equipment Operators	CITC	Priority Hire ZIP Codes	3	16%	1	5%	2	11%	3	16%	0	0%
	CITC	Other ZIP Codes	16	84%	0	0%	16	84%	11	58%	5	26%
	Other Programs	Priority Hire ZIP Codes	11	20%	4	7%	7	13%	5	9%	6	11%
	Other Programs	Other ZIP Codes	45	80%	6	11%	39	70%	35	63%	10	18%
Plumbers, Pipefitters, and Steamfitters	CITC	Priority Hire ZIP Codes	4	17%	0	0%	4	17%	0	0%	4	17%
	CITC	Other ZIP Codes	19	83%	0	0%	19	83%	11	48%	8	35%
	Other Programs	Priority Hire ZIP Codes	68	30%	2	1%	66	29%	51	22%	17	7%
	Other Programs	Other ZIP Codes	162	70%	10	4%	152	66%	136	59%	26	11%
HVAC Installers and Repairers	CITC	Priority Hire ZIP Codes	6	35%	1	6%	5	29%	1	6%	5	29%
	CITC	Other ZIP Codes	11	65%	0	0%	11	65%	9	53%	2	12%
	Other Programs	Priority Hire ZIP Codes	16	36%	0	0%	16	36%	14	31%	2	4%
	Other Programs	Other ZIP Codes	29	64%	0	0%	29	64%	27	60%	2	4%

Note: The "Share of Active" column indicates the share of active apprentices in that ZIP code group, program, demographic subset, and trade out of all active apprentices in that program, and trade.

## EXHIBIT A-5. ACTIVE APPRENTICES BY PRIORITY ZIP CODE STATUS, TRADE, GENDER, AND RACE (Continued)

King, Pierce, and Snohomish Counties; 2015 Apprentices

Program	ZIP	All Apprentices		Female		Male		White		People of Color	
		Active	Share of Active	Active	Share of Active	Active	Share of Active	Active	Share of Active	Active	Share of Active
Structural Iron and Steel	Priority Hire ZIP Codes	59	25%	7	3%	52	22%	29	12%	30	13%
	Other ZIP Codes	175	75%	13	6%	162	69%	115	49%	60	26%
Drywall and Ceiling Tile	Priority Hire ZIP Codes	44	27%	0	0%	44	27%	11	7%	33	20%
	Other ZIP Codes	118	73%	2	1%	116	72%	81	50%	37	23%
Elevator Installers and Repairers	Priority Hire ZIP Codes	20	14%	1	1%	19	14%	9	6%	11	8%
	Other ZIP Codes	119	86%	2	1%	117	84%	60	43%	59	42%
Roofers	Priority Hire ZIP Codes	12	17%	1	1%	11	16%	4	6%	8	11%
	Other ZIP Codes	58	83%	6	9%	52	74%	31	44%	27	39%
Cement Masons and Concrete	Priority Hire ZIP Codes	24	27%	3	3%	21	24%	7	8%	17	19%
	Other ZIP Codes	65	73%	7	8%	58	65%	41	46%	24	27%
Glaziers	Priority Hire ZIP Codes	9	26%	0	0%	9	26%	8	23%	1	3%
	Other ZIP Codes	26	74%	2	6%	24	69%	21	60%	5	14%
Brickmasons and Blockmasons	Priority Hire ZIP Codes	15	33%	1	2%	14	31%	7	16%	8	18%
	Other ZIP Codes	30	67%	0	0%	30	67%	23	51%	7	16%
Tapers	Priority Hire ZIP Codes	7	39%	0	0%	7	39%	3	17%	4	22%
	Other ZIP Codes	11	61%	1	6%	10	56%	5	28%	6	33%
Boilermakers	Priority Hire ZIP Codes	5	33%	1	7%	4	27%	2	13%	3	20%
	Other ZIP Codes	10	67%	0	0%	10	67%	8	53%	2	13%
Insulation Workers,	Priority Hire ZIP Codes	5	21%	0	0%	5	21%	2	8%	3	13%
	Other ZIP Codes	19	79%	0	0%	19	79%	14	58%	5	21%
Plasterers and Stucco Masons	Priority Hire ZIP Codes	5	29%	1	6%	4	24%	2	12%	3	18%
	Other ZIP Codes	12	71%	2	12%	10	59%	8	47%	4	24%
Carpet Installers	Priority Hire ZIP Codes	0	0%	0	0%	0	0%	0	0%	0	0%
	Other ZIP Codes	9	100%	0	0%	9	100%	4	44%	5	56%
Construction and Related Workers,	Priority Hire ZIP Codes	1	14%	1	14%	0	0%	1	14%	0	0%
	Other ZIP Codes	6	86%	0	0%	6	86%	5	71%	1	14%
Tile and Marble Setters	Priority Hire ZIP Codes	4	57%	0	0%	4	57%	2	29%	2	29%
	Other ZIP Codes	3	43%	0	0%	3	43%	2	29%	1	14%
Insulation Workers, Floor,	Priority Hire ZIP Codes	4	22%	0	0%	4	22%	0	0%	4	22%
	Other ZIP Codes	14	78%	0	0%	14	78%	10	56%	4	22%
Pipelayers	Priority Hire ZIP Codes	1	50%	0	0%	1	50%	0	0%	1	50%
	Other ZIP Codes	1	50%	0	0%	1	50%	1	50%	0	0%
Stonemasons	Priority Hire ZIP Codes	0	0%	0	0%	0	0%	0	0%	0	0%
	Other ZIP Codes	3	100%	0	0%	3	100%	3	100%	0	0%

Note: The “Share of Active” column indicates the share of active apprentices in that ZIP code group, demographic subset, and trade out of all active apprentices in that trade.

In 2015, three construction occupations had no active apprentices: Surveyors, Terrazzo Workers, and Mason and Tile Helpers.