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# 2020 Evaluation of the Highway Construction Workforce Development Program

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# 2020 Evaluation of the Highway Construction Workforce Development Program

Maura Kelly and Lindsey Wilkinson  
Department of Sociology, Portland State University  
October 2020



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# 2020 Evaluation of the Highway Construction Workforce Development Program

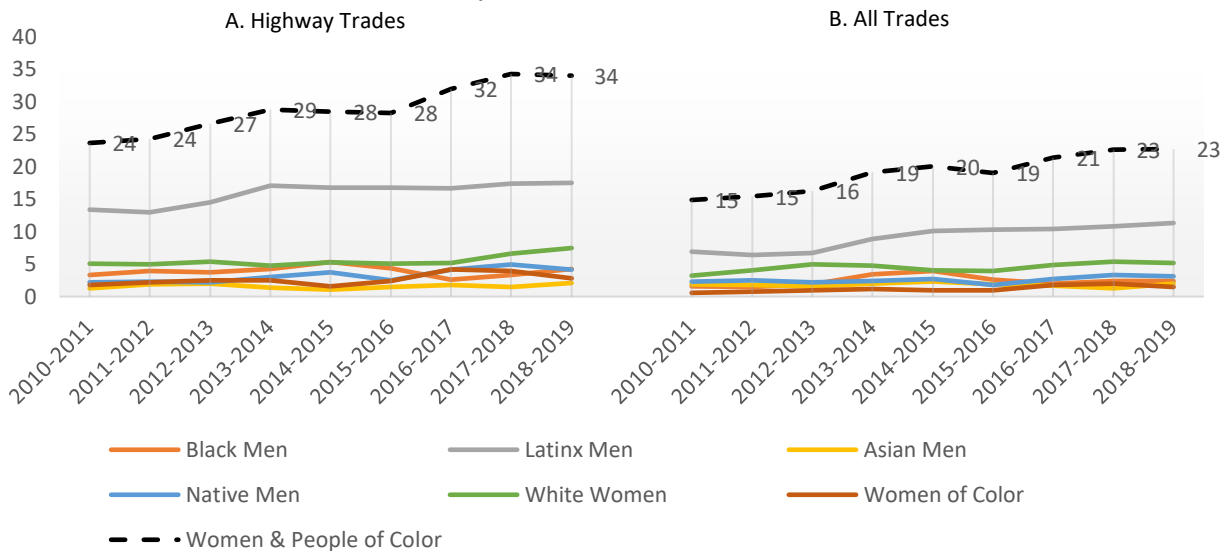
## Executive summary

Maura Kelly and Lindsey Wilkinson  
 Department of Sociology, Portland State University  
 October 2020

The Oregon Department of Transportation (ODOT) and Oregon Bureau of Labor and Industries (BOLI) have partnered in a statewide effort—the Highway Construction Workforce Development Program—to recruit, train, and employ a diverse workforce for highway construction jobs throughout the state. This program, begun in 2010, supports a variety of initiatives designed to improve the recruitment and retention of women and people of color in Oregon’s highway construction trades. The programs evaluated in this report include the following: pre-apprenticeship programs, supportive services providing financial assistance (i.e., fuel assistance; support for overnight travel; childcare; work clothes, tools, and protective equipment; hardship funds) and supportive services providing non-financial assistance (i.e., budget class, social support). This report provides findings based on data from the Oregon Apprenticeship System (OAS) and interviews with 26 individuals who either completed or terminated an apprenticeship in 2018-2019. Overall, this evaluation finds that the Highway Construction Workforce Development Program is improving the recruitment and retention of a diverse construction workforce.

**Finding 1:** The Oregon highway construction workforce is continuing to become more diverse, with increased integration of women and people of color in apprenticeships (see Figure ES1).

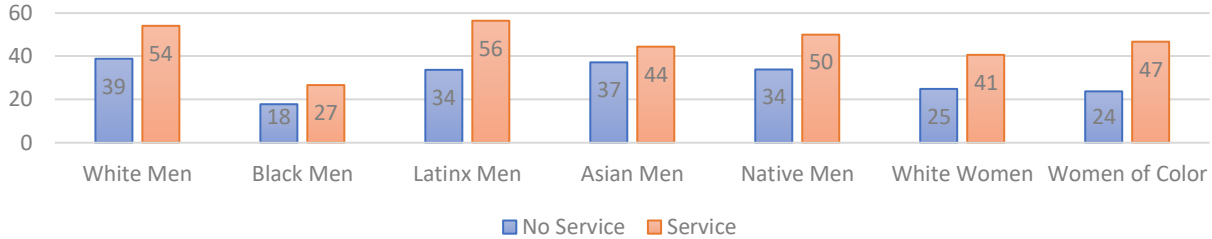
Figure ES1. Percentage of Apprentices Completing Who are Women or People of Color, 2010-2019



**Finding 2:** The Highway Construction Workforce Development Program improves completion rates for apprentices in eligible trades who receive services (see Figure ES5). Among apprentices

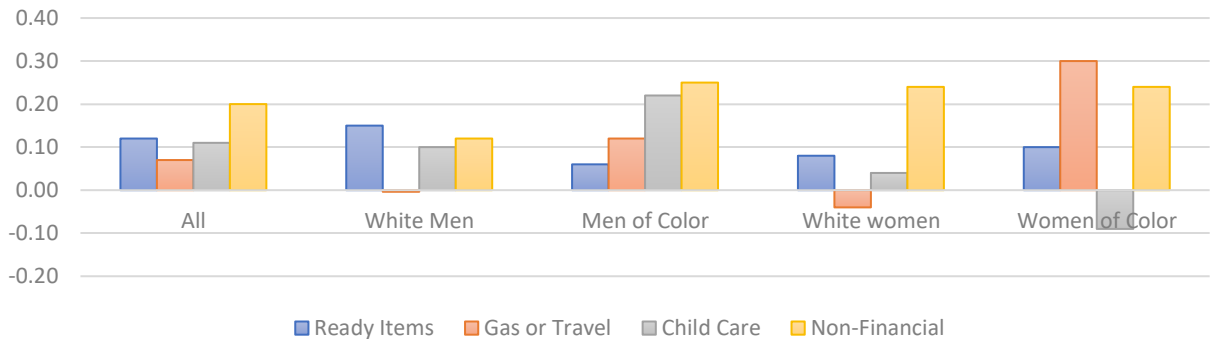
in the 2018-19 cohorts, on average, those receiving services were 11% more likely to complete their apprenticeship than those who did not receive services (not shown).

Figure ES2. Percent of Apprentices in Highway Trades Completing by Service Receipt and Race/Ethnicity and Gender, 2008-2019 Cohorts



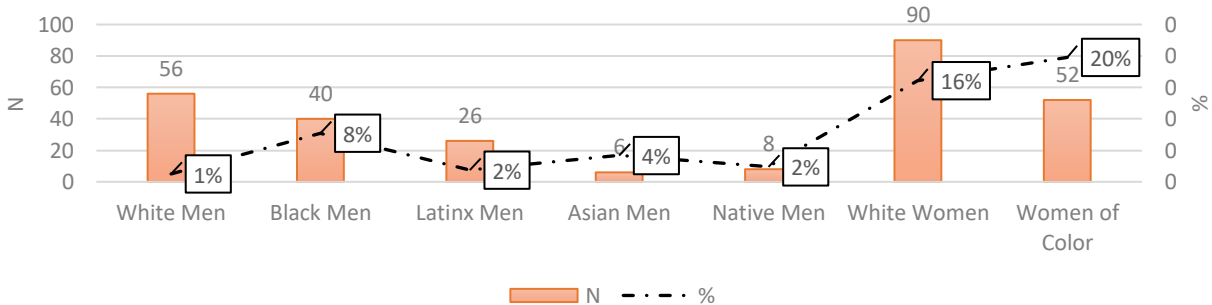
**Finding 3:** Among all apprentices in the 2008-2019 cohorts, those receiving non-financial services are 20% more likely to complete rather than cancel, relative to those not receiving services. Those receiving ready items are 12% more likely, those receiving gas/travel support are 7% more likely, and those receiving child care support are 11% more likely to complete (See Figure ES3). Financial services are more effective when paired with non-financial services (not shown).

Figure ES3. Estimated Adjusted Marginal Effects of Receiving Services on Completion by Race/Ethnicity and Gender, 2008-19 Cohorts



**Finding 4:** Pre-apprenticeship programs have contributed to the increasing numbers of women and people of color in the highway construction trades (see Figure ES4). Completing a pre-apprenticeship has a positive effect on completion among women (not shown).

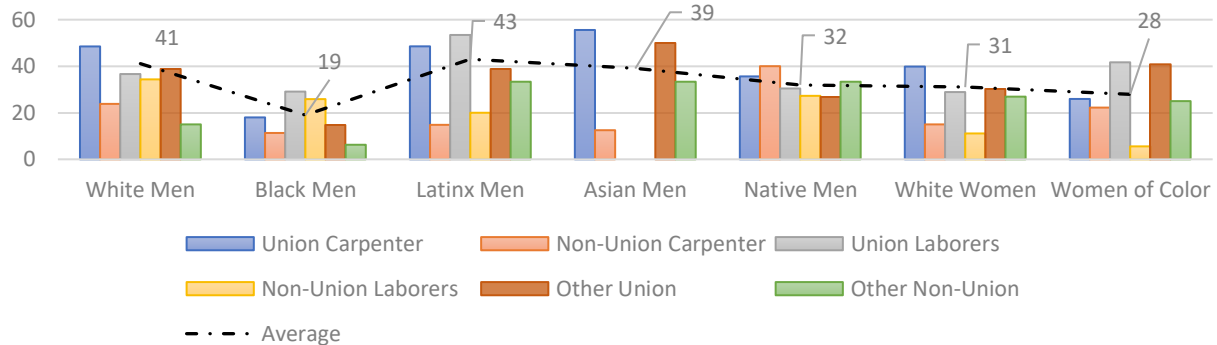
Figure ES4. Percent and Number of Apprentices in Highway Construction Trades Completing a Pre-Apprenticeship by Race/Ethnicity and Gender, 2008-19 Cohorts





**Finding 5:** Women and some racial/ethnic minority apprentices are less likely than white men to complete their apprenticeship on time (see Figure ES5), but progress continues to be made in increasing the completion rates of women and people of color.

Figure ES5. Percent of Apprentices in Highway Trades Completing On Time by Race/Ethnicity and Gender and Trade, 2005-2013 Cohorts



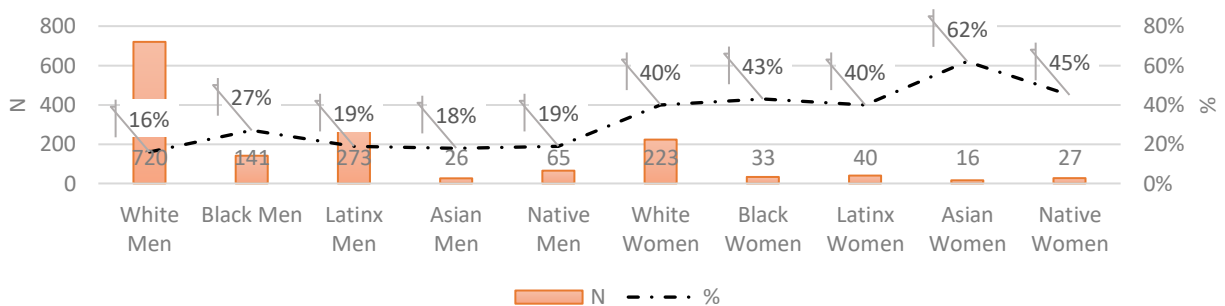
**Finding 6:** Findings from interviews with apprentices who received services from the Highway Workforce Development Program illustrated some of the common reasons why apprentices leave the trades (see Box ES1)

**Box ES1. Apprentice challenges that led to leaving the trades**

- Financial challenges
- Lack of consistent work
- Harassment and discrimination
- Lack of mentorship and on-the-job training, difficulty learning the skills of the trade
- Long hours away from home and cost of travel
- Difficulty of the work

**Finding 7:** The Highway Construction Workforce Development Program reaches a diverse group of apprentices, although the majority of participants are white men (see ES6).

Figure ES6. Percent and Number of Apprentices in Highway Construction Trades Receiving Services by Race/Ethnicity and Gender, 2008-2019 Cohorts



Recommendations: Overall, pre-apprenticeship and supportive services funded by the Highway Construction Workforce Development Program are increasing the recruitment and retention of a diverse workforce and these efforts should be continued. Many apprentices would benefit from “wrap-around” services in which a single point of contact could connect apprentices with financial and non-financial support available through the Highway Construction Workforce Development Program as well as additional support available within the trades and in broader communities. As non-financial services have the largest impact on completion, we recommend more funding should be directed towards this type of service. Interview data indicated unmet needs that could potentially be addressed through non-financial supportive services (see Box ES2). Interview data also identified issues that are better addressed at a structural level (see Box ES3).

Box ES2. Non-financial support needed to improve retention

- How to stay consistently employed
- How to budget, apply for unemployment, and access other financial supports within and outside the trades.
- How to respond to harassment and discrimination and/or advice about how to communicate with employers and/or apprenticeship programs about the challenges of their current job assignment
- How to access mentorship and on-the-job training and/or advice about how to communicate with their employers and/or apprenticeship programs about the challenges of their current job assignment and ask for a rotation if needed
- How to communicate with their employers and/or apprenticeship programs about the challenges of working out of town and ask for a rotation

Box 3. Structural changes to improve retention

- Revise current processes for assigning work to ensure equal access to on-the-job hours for women and people of color.
- Promote respectful workplaces through employer policies and worker training.
- Create a system for reporting harassment and discrimination across job sites.
- Promote teaching and mentorship through employer policies and worker training.
- Provide opportunities for apprentices to rotate out of jobs where they are not learning the skills of the trade.
- Provide opportunities for apprentices to rotate out of jobs that require long hours, are far from home, not ideal schedules, or are otherwise not a good fit.
- Require employers to pay for apprentices’ travel expenses for out of town work.

Full 2020 report available at: <http://maura-kelly.com/>



## Introduction

The Oregon Department of Transportation and Oregon Bureau of Labor and Industries have partnered in a statewide effort—the Highway Construction Workforce Development Program—to recruit, train, and employ a diverse workforce for highway construction jobs throughout the state. This program, which began in 2010, supports a variety of initiatives designed to improve the recruitment and retention of women and people of color in Oregon’s highway construction trades.

The services evaluated in this report include: pre-apprenticeship programs, supportive services providing financial assistance (i.e., fuel assistance and support for overnight travel; childcare; and work clothes, tools, and protective equipment), the newly implemented hardship assistance fund, and supportive services providing non-financial assistance (e.g., counseling, budget class). This report provides findings based on data from the Oregon Apprenticeship System (OAS) from 2005-2019 and qualitative interviews with 26 apprentices conducted in 2020.

Overall, the current study demonstrates the effectiveness of the Highway Construction Workforce Development Program at improving both the recruitment and retention of a diverse workforce over the past decade as well as effectiveness of the program since the last reporting period.

### Recruitment and retention of apprentices

#### *Trends in recruitment*

The Oregon highway construction workforce is continuing to become more diverse, with increased integration of women and people of color in apprenticeships. As shown in Figure 1, in 2018/19 the percentage of new apprentices in the highway construction trades who were white men dropped to 52%, a decline of 16 percentage points since 2007/08, and a decline of five percentage points since 2017/18 (panel A). Notably, the percentage of new apprentices who are white men is lower in the highway construction trades than in all trades combined (panel B).

**As a result of increased recruitment, women and people of color comprise a growing proportion of those completing apprenticeships** (Figure 2). In the highway construction trades (side A), 34% of apprentices completing in 2017/18 and in 2018/19 were women or people of color, compared to only 24% in 2010/11. Women and people of color comprise a larger percentage of apprentices completing in the highway construction trades than in all trades combined (panel B).

Figure 1. New Apprentices in Construction Trades in Oregon by Race/Ethnicity and Gender, 2005-2019 Cohorts

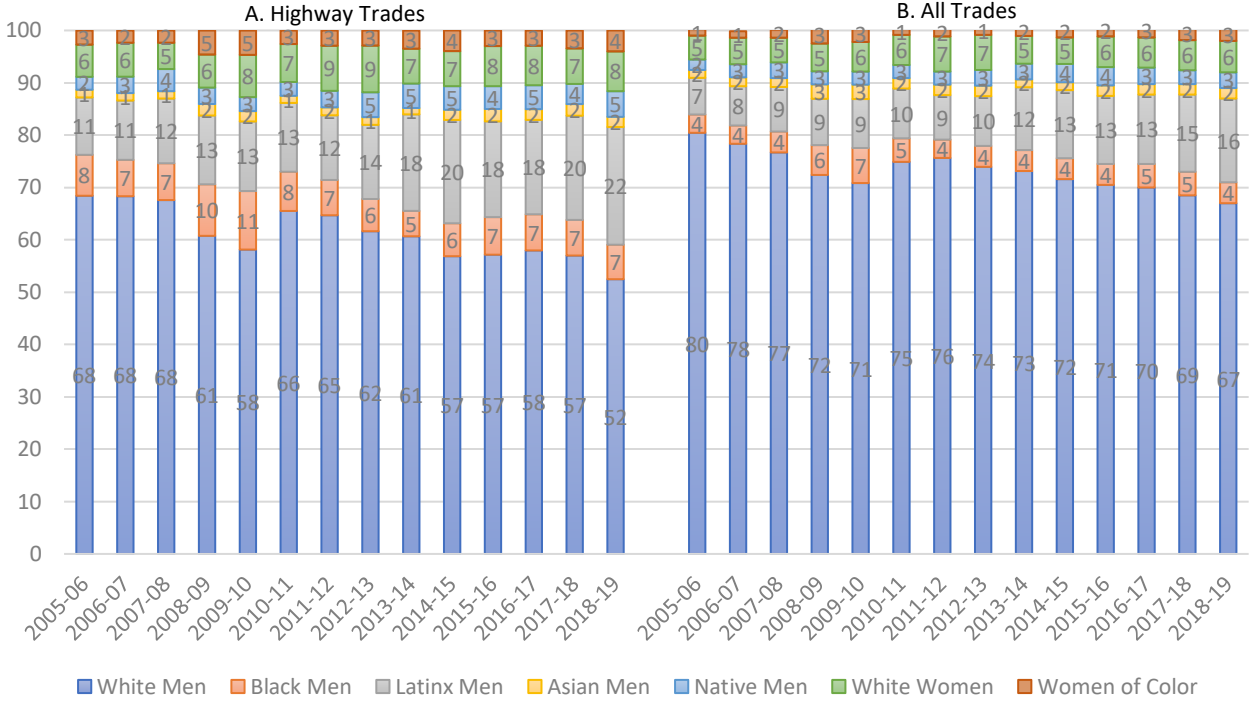
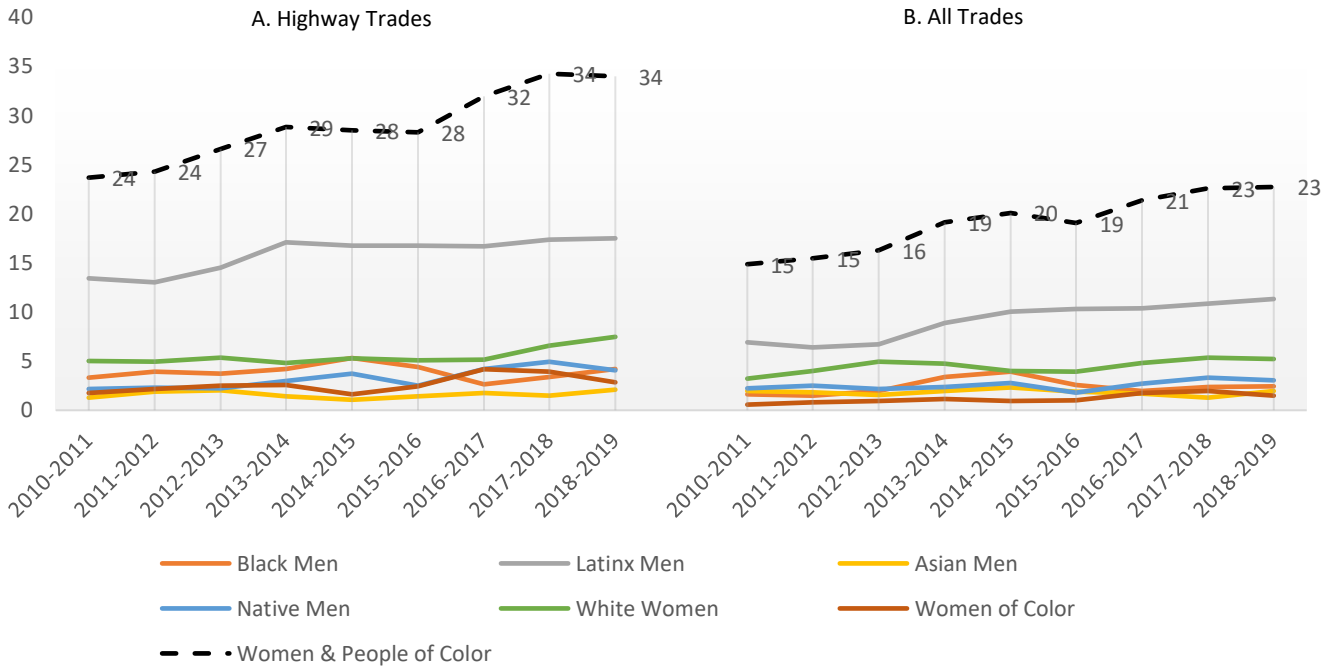
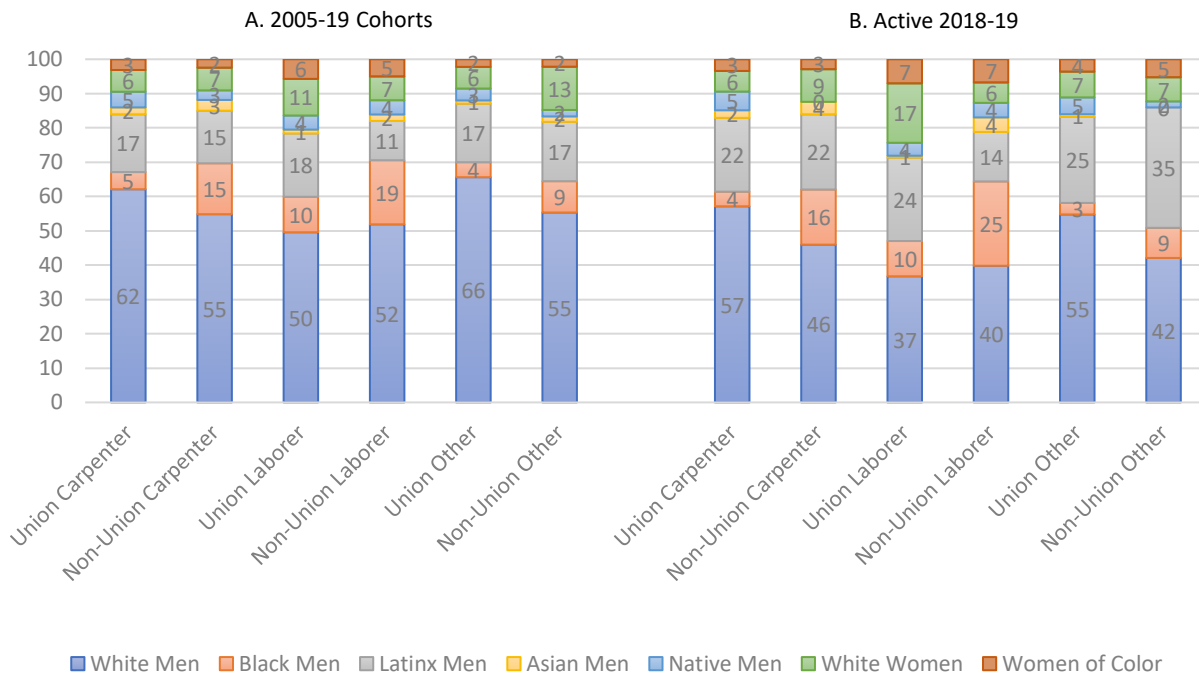


Figure 2. Percentage of Apprentices Completing Who are Women or People of Color, 2010-2019



Importantly, as seen in Figure 3, **the percentage of new apprentices in the highway construction trades who are women or people of color varies across trade.** The laborer trade, both union and non-union, has the lowest percentage of white men among 2005-2019 cohorts (panel A) and among apprentices active in 2018-19 (panel B). The percentage of white men is highest in the carpenter (union) trade and other (union) trades. This is significant given differences in compensation across trades, with laborers receiving the lowest hourly pay. There are also important differences across race/ethnicity, with Black men over-represented in the laborer (non-union) trade and women active in 2018-19 (panel B) also over-represented in the laborer trade.

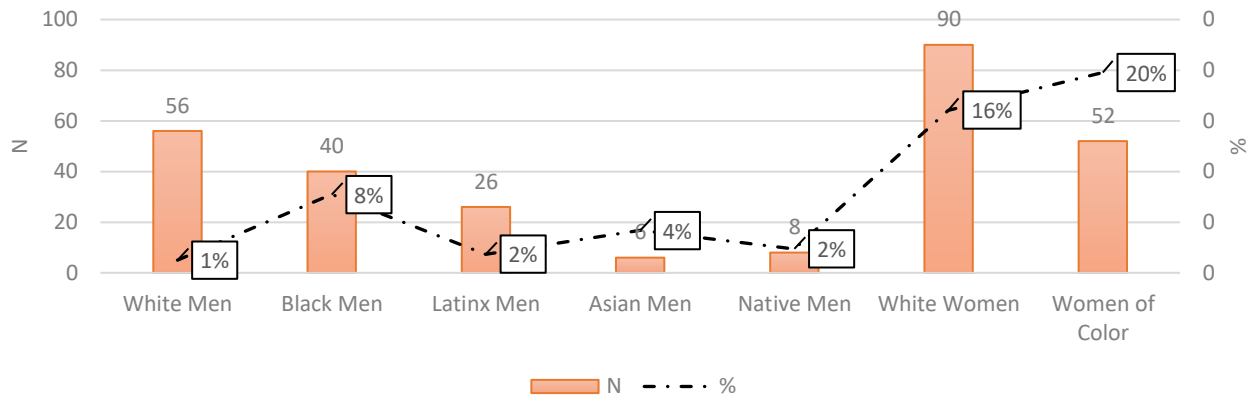
Figure 3. New Apprentices in Highway Trades by Race/Ethnicity and Gender by Trade, 2005-2019 Cohorts and Active 2018-19 (OAS Data)



### Recruitment through pre-apprenticeship

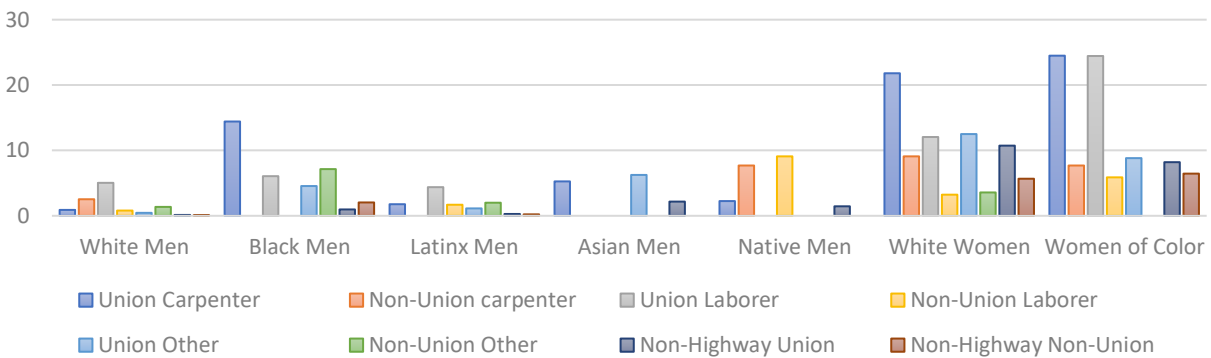
Pre-apprenticeship programs funded through the Highway Construction Workforce Development Program have contributed to the increased numbers of women in the highway construction trades. **In the 2008-19 cohorts of new apprentices, 90 white women and 52 women of color entered a highway a construction apprenticeship after completing a pre-apprenticeship, representing 16% of all white women and 20% of all women of color apprentices in the 2008-2019 cohorts.**

Figure 4. Percent and Number of Apprentices in Highway Construction Trades Completing a Pre-Apprenticeship by Race/Ethnicity and Gender, 2008-19 Cohorts



Pre-apprenticeship classes are also helping to channel more women and more Black men into non-laborer trades, especially into the carpenter (union) trade (see Figure 5).

Figure 5. Percent of Apprentices in Highway Trades Completing Pre-Apprenticeship by Race/Ethnicity and Gender, 2008-19 Cohorts



### Trends in retention

**Women and some racial/ethnic minority groups are less likely than white men to complete their apprenticeship on time, yet progress continues to be made.** For example, among all women of color in the 2005-2013 cohorts, 28% completed on time (Figure 6). This is compared to 37% of women of color in 2010-2013 cohorts completing on time (Figure 7). Among Black men in the 2005-2013 cohorts, 19% completed on time, while 24% of Black men in the 2010-2013 cohorts completed on time. On-time completion rates are higher for all women and people of color in 2010-2013 cohorts, relative to those in the 2005-2013 cohorts. Among race/ethnic and gender groups, on-time completion rates vary across trade. For example, while the majority of apprentices in the union carpenter trade have above average on-time completion rates, Black men and women of color in the union carpenter trade have lower than average on-time completion rates. In contrast,

Black men and women of color in the union laborer trade have higher than average on-time completion rates. Perhaps these trends are related to the percentage of same-race and same-gender peers in each trade: for example, Black men and women of color are underrepresented in the union carpenter trade. Alternatively, perhaps Black men and women of color, who have been historically underrepresented in the construction trades, are being better prepared for completion in the laborer trade, relative to in non-laborer trades, which require additional skills and familiarity with more construction tools.

Figure 6. Percent of Apprentices in Highway Trades Completing On Time by Race/Ethnicity and Gender and Trade, 2005-2013 Cohorts

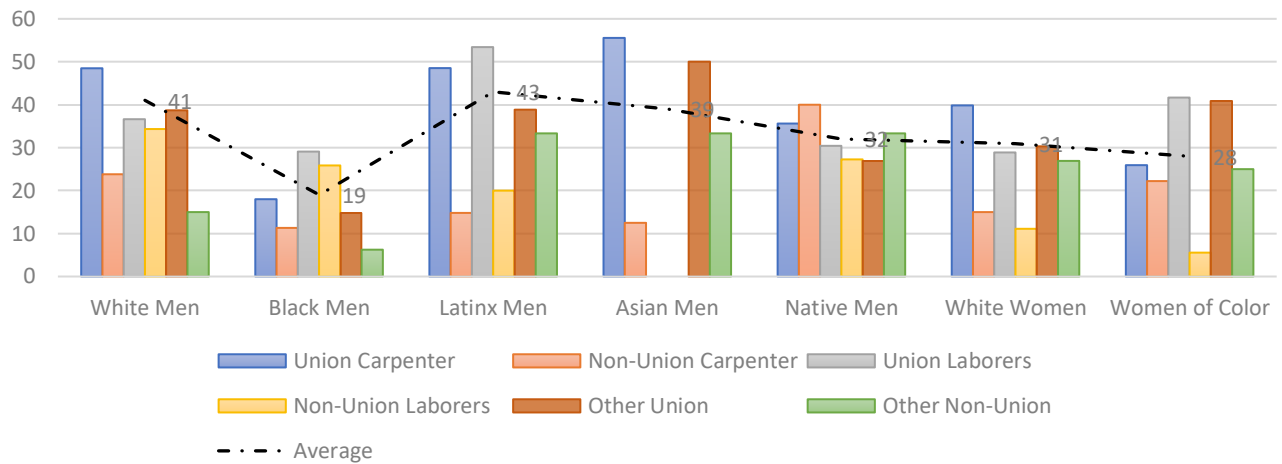
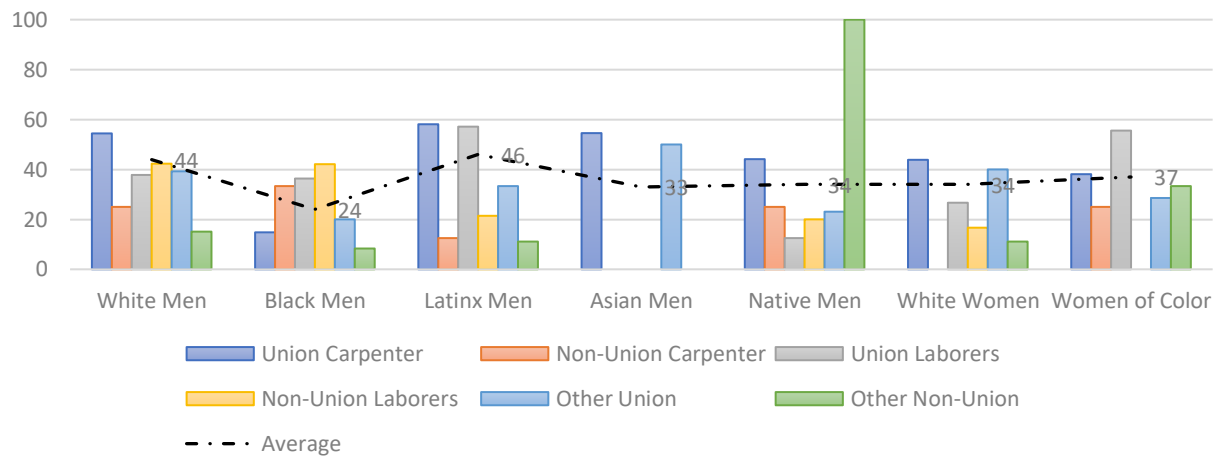


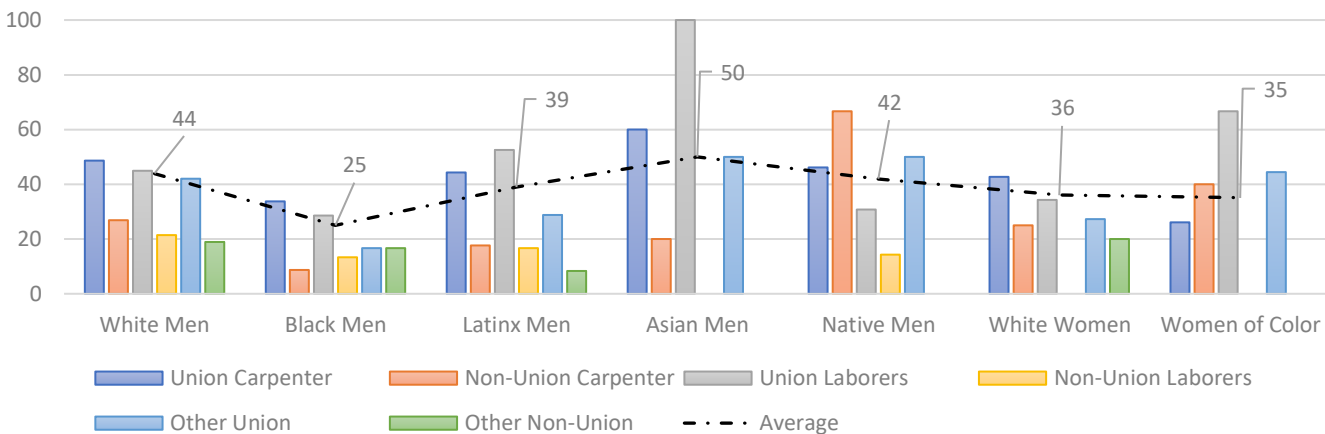
Figure 7. Percent of Apprentices in Highway Trades Completing On Time by Race/Ethnicity and Gender and Trade, 2010-2013 Cohorts



**Among apprentices who completed or were cancelled, women and racial/ethnic minority apprentices (with the exception of Asian men) also have lower completion rates** (Figure 8). This gap, however, varies by race/ethnicity. Black men had the lowest completion rate (25%) among apprentices active in 2018-2019 (Figure 8). Asian identified men had a higher completion

rate (50%) than white men (44%), and the completion rate of Native identified men was similar (42%) to that of white men. Latino apprentices active in 2018-19 had a completion rate of 39%, which was somewhat lower than that of white men. While the overall completion rate among apprentices active in 2018-19 was lower than the overall completion rate of apprentices active in 2016-17, there was greater parity in completion rates between gender and racial minorities and white men in 2018-19.

Figure 8. Percent of Apprentices in Highway Trades Completing by Race/Ethnicity and Gender and Trade, Apprentices Active 2018-19



### Challenges experienced by apprentices

Table 1 shows the challenges reported in qualitative interviews with apprentices who had received services through the Highway Construction Workforce Development program. In the following sections, we provide some detail on the most commonly experienced types of challenges and how they impacted participants’ ability to be successful in their apprenticeship. Note that while we differentiate financial and non-financial challenges, “non-financial” challenges can have short-term and long-term financial implications for apprentices.

#### Financial Challenges

Cancelled apprentices were more likely than completed apprentices to report experiencing every type of financial challenge, with the exception of paying for parking. **Cancelled apprentices reported an average of six different financial challenges, compared to completed apprentices who reported an average of four different financial challenges.**

**Costs associated with work.** Affording ready items (tools, clothing, and PPE), gas to get to work and class, travel for out of town work, and parking were issues for many apprentices. Most apprentices reported that these challenges were fully or mostly resolved by the support they received from the Program or other sources. One exception was Dave, who declined to report the reason he left his apprenticeship in his interview but he described his biggest challenge: **“There was a point in time where whoever was paying for my hotel, stopped paying because I reached a limit, so I started sleeping in my car”** (white man, cancelled). A 2018 survey of



Oregon apprentices found that self-reported challenges with ready items and travel expenses were associated with lower completion rates (Wilkinson and Kelly 2018).

Table 1 Challenges experienced by apprentices (most to least frequently reported)

Financial challenges	Non-financial challenges
Ready items (tools, clothing, PPE)	Difficult coworkers
Gas	Harassment and discrimination
Housing	Lack of mentorship and on-the-job training
Being out of work too long	Physically difficult work
Travel for out-of-town work	Learning the skills of the trade
Reliable transportation	Childcare
Low wages (especially in early periods of apprenticeship)	Family trouble
Unfairly laid off	Long hours away from home
Childcare	Being older
Unfairly assigned fewer work hours	Driver's license
Food	
Parking	

Note: Questions about physically difficult work, long hours away from home, challenges learning the skills of the trade, being older, affording food, and affording parking were not asked to all participants but were mentioned by some participants when asked about any other challenges they had experienced.

**Housing.** Affording housing was a challenge for many interview participants. For example, one apprentice noted: **“Housing was a pretty major problem because of lack of hours and being laid off all the time, made it hard to pay the rent”** (Latina, cancelled). The unreliable nature of trades work made maintaining housing a challenge.

**Access to on the job hours.** Being out of work too long (and the associated issues of being unfairly laid off and being unfairly assigned fewer hours) were common themes in discussions about challenges of being an apprentice. Cancelled apprentices were much more likely to report being out of work too long as a challenge. Three of the ten cancelled apprentices cited this as one of the *primary reasons* they left the trades. For example, one apprentice reported he left his apprenticeship because of discrimination and being out of work too much; he stated **“I just decided to not do it anymore because what I've experienced myself and I'm at the age where like I can't be doing that anymore. Kept getting laid off, laid off. I needed something consistent. That's why I decided to go a different route”** (Latino, cancelled). The finding about the impact of being out of work too much on completion is consistent with our 2018 survey, which found self-reports of being out of work too much were negatively associated with completing an apprenticeship, with a larger effect for women and people of color than white men (Wilkinson and Kelly 2018). In our analysis of 2018-2019 data, we found that women and Black men accumulated on the job hours more slowly than white men. Those who accumulated OTJ hours more slowly were less likely to complete their apprenticeship. Women apprentices and apprentices of color accumulate OTJ hours more slowly primarily because of informal practices in which (primarily white male) senior workers favor white male apprentices, such as retaining white male workers while laying off women and people of color (Wilkinson and Kelly 2018; Kelly et al 2015).

**Transportation** Reliable transportation came up as a challenge in about half the interviews. For example, one apprentice explained: **“I got lucky. I had to take a lot of risks with a vehicle I**

**didn't really have the resources at the time to maintain it properly”** (white man, completed). Two of the ten cancelled apprentices reported not having a vehicle to get to work, for example: **“Well on the jobs that I took, I always let them know that I just want to [work in Portland] Metro... I was riding on public transportation at that time... It took me two hours to get me to work”** (Latino, cancelled).

*Childcare.* Childcare is a unique challenge in that it has both a non-financial component (being able to identify childcare that can provide coverage for apprentices’ changing and often irregular work schedules) and a financial component (being able to find affordable childcare). Both completed and cancelled apprentices in the interview study reported that affording childcare was a challenge, even for some who received some help through the Program. In the 2018 survey, 29% of parents identified finding consistent childcare a problem and 34% identified the cost of childcare as a problem; mothers were more likely than fathers to identify both of these issues as challenges (Wilkinson and Kelly 2018). Apprentices resolved the challenge of affording childcare with one or more of the following strategies: having the other parent have primary responsibility for childcare (only men reported this), supplementing childcare with unpaid childcare by family members (men were more likely to report this), having a subsidy for childcare through the Program, and changing childcare arrangements over the course of the apprenticeship. For example, Scott was able to complete his apprenticeship because he had both a partner and other family to care for his children while he was working. He recalled **“[Childcare] became kind of a major problem. It was just we didn't want to send the kids to a daycare because that was going to cost way too much, but we couldn't really afford to have a babysitter come every day. So that's why my wife had to leave her other job”** (white man, completed).

### *Non-financial challenges*

As shown in Table 1, apprentices also reported a variety of non-financial challenges. There were fewer differences between completed and cancelled apprentices for non-financial challenges compared to financial challenges. **Both cancelled and completed apprentices reported about 3.5 different non-financial challenges on average.** Cancelled apprentices were more likely than completed apprentices to report difficult coworkers, a lack of mentorship, long hours away from home, and having a driver’s license as challenges during their apprenticeship.

*Harassment and discrimination.* Interview participants reported racism, sexism, sexual harassment, cissexism (discrimination against transgender people), heterosexism (discrimination against non-heterosexual people), and other forms of harassment and discrimination. Majorities of both completed and cancelled apprentices reported harassment and discrimination as a challenge during their apprenticeships. Five of the ten cancelled apprentices reported that harassment and discrimination was either the reason they left or one of their biggest challenges. For example, one apprentice reported **“we were carrying this [piece of equipment] between six people, and they didn't like me, so they dropped it without counting down and it landed on my foot”** (Latino, cancelled). Luis said he terminated his apprenticeship because of this incident. Another apprentice said **“I would say the hardest part [of my apprenticeship] was racism”** (Black man, completed). Previous research on Oregon apprentices found self-reports of experiencing discrimination was pervasive and negatively associated with retention in the trades, with a larger effect for women and people of color than white men (Wilkinson and Kelly 2018).

*Lack of mentorship and on the job training.* A lack of mentorship and access to on-the-job training was a common non-financial challenge reported by apprentices, for example, **“A lot of the times I was left by myself and I didn't know exactly what to do and that would just result in people being mad”** (Latino, cancelled). Some apprentices were able to complete their apprenticeship with inadequate training and felt underprepared in their role as journeyworkers. For example, one apprentice recalled: **“[As an apprentice I was] just supposed to learn by watching where everyone else got to learn by actually experiencing things... And like even now [as a journey worker] I'm caulking, when I should be wearing my tools and actually building”** (white woman, completed). Previous research has demonstrated that a lack of access to someone to teach the skills of the trade is negatively associated with completion (Wilkinson and Kelly 2018).

*Long hours away from home.* Three of the ten cancelled apprentices noted that being away from home for long hours was a challenge in their apprenticeships. For example, Alice reported that the biggest challenge during her apprenticeship, and the reason she left, was because she had to leave her home at 3:30am and return at 7:00pm, which meant she rarely saw her small children. When interviewed, she reported she was currently working as a bartender. About working in the trades, she said **“It's an amazing opportunity and, if you don't have small children, it's the greatest ever. And I hope maybe one day to maybe possibly go back to it when my kids are a little older and in school”** (white woman, cancelled).

*Driver's license.* Three of the 26 participants reported that maintaining a driver's license was a challenge during their apprenticeship. Two noted that larger financial challenges prevented them from paying their car insurance or maintaining their car, which led to the suspension of their licenses. As Mike noted **“[It was a major problem]. Because my finances were so bad from the non-union work, I had chosen to not pay my insurance for a while until I joined the union and then I was paid enough, I could afford my insurance. I did have my license suspended at one point and had to drive to work with a suspended license, which is illegal”** (white man, completed).

Table 2 summarizes the experiences that cancelled apprentices identified as reasons why they left the trades or their biggest challenges. Also shown are potential supportive services and structural changes that could prevent apprentices from leaving the trades for these reasons.

Table 2. Cancelled apprentices' challenges and needed individual supports and structural change

<b>Apprentice challenges that led to termination</b>	<b>Needed individual supportive services to support retention</b>	<b>Needed structural changes to support retention</b>
Financial challenges	Financial supports from the Program. Someone to provide support on how to budget, apply for unemployment, and access other financial supports within and outside the trades.	See suggested changes for addressing the lack of consistent work and cost of travel.
Lack of consistent work	Someone to provide advice on how to stay consistently employed (work assignment is more effectively addressed at a structural level)	Equal access to on-the-job hours for women and people of color. This may require revising current processes for assigning work that systematically benefit white male apprentices.
Harassment and discrimination	Someone to provide advice on how to respond to harassment and discrimination or advice about how to communicate with their employers and/or apprenticeship programs about the challenges of their current job assignment (job site harassment and discrimination are more effectively addressed at a structural level).	Promote respectful workplaces through employer policies and worker training. Create a system for reporting harassment and discrimination across job sites.
Lack of mentorship and on-the-job training, difficulty learning the skills of the trade	Someone to provide advice on how to access mentorship and on-the-job training or advice about how to communicate with their employers and/or apprenticeship programs about the challenges of their current job assignment (rotation is more effectively addressed at a structural level).	Promote teaching and mentorship through employer policies and worker training. Opportunities for apprentices to rotate out of jobs where they are not learning the skills of the trade.
Long hours away from home and cost of travel	Additional support for out-of-town travel from the Program. Someone to provide advice about how to communicate with their employers and/or apprenticeship programs about the challenges of their schedule (rotation is more effectively addressed at a structural level).	Require employers to pay for apprentices' travel expenses for out-of-town work. Opportunities for apprentices to rotate out of jobs that require long hours, are far from home, not ideal schedules, or are otherwise not a good fit.
Difficulty of the work	Apprentices who find the work physically difficult may not be a good fit for the trades; however, when this is not the main challenge, apprentices need support to address the other challenges they face.	No specific changes.

## Financial and non-financial support from the Highway Construction Workforce Development Program

### *Participation in the Highway Construction Workforce Development Program*

**The Highway Construction Workforce Development Program reaches a diverse group of apprentices, although the majority of program participants are white men.** While race/ethnicity and gender are not criteria for receiving services, the program has been successful in reaching disadvantaged apprentices, as shown in Figures 9 and 10. Among highway construction trades apprentices in the 2008-2019 cohorts, 505 men of color, 116 women of color, and 223 white women have received services. More than 40% of women have received services, compared to 16% of white men. Importantly, among racial/ethnic minority men, Black men received services at the highest rate, with 27% of Black men receiving services, mostly through ready items (Figure 10). Across all race/ethnic and gender groups, the most commonly received service is ready items, followed by, with an exception among women, funds for gas or travel. Women, both white women and women of color, receive non-financial support services at higher rates than men.

Figure 9. Percent and Number of Apprentices in Highway Construction Trades Receiving Services by Race/Ethnicity and Gender, 2008-2019 Cohorts

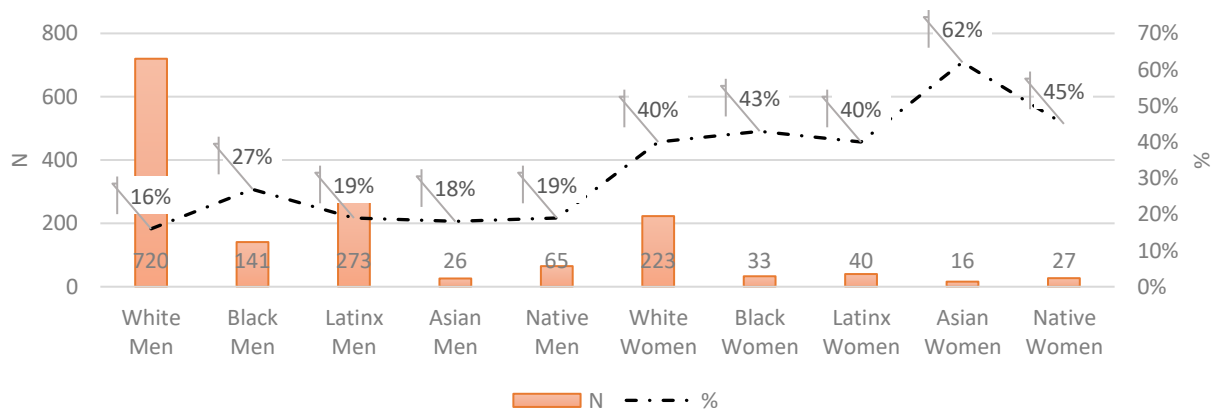
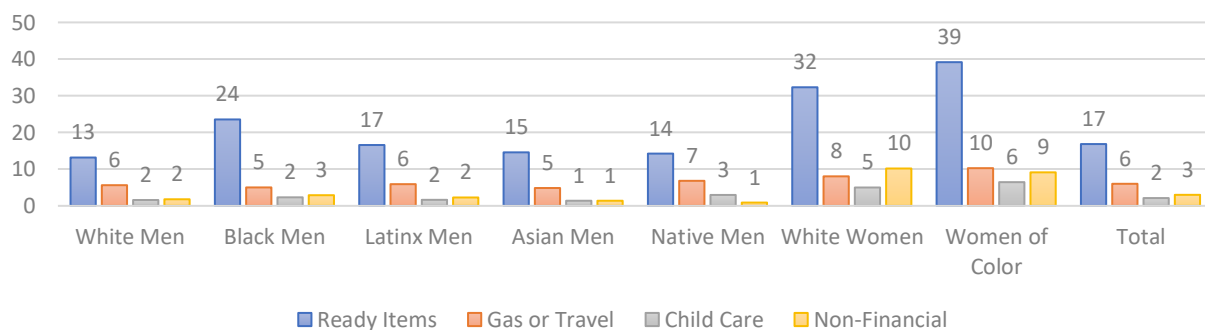
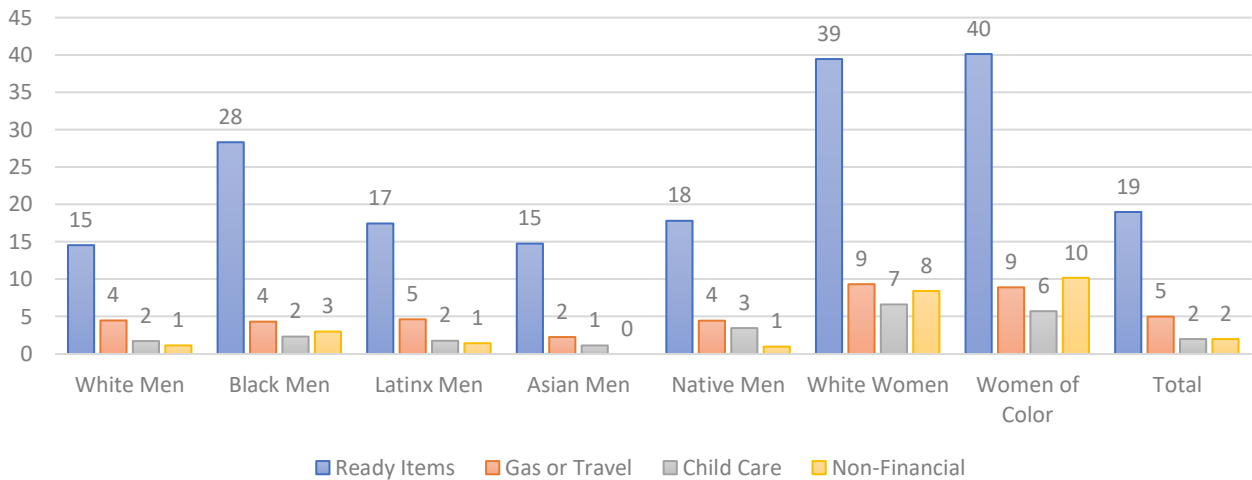


Figure 10. Percent of Apprentices in Highway Trades Receiving Workforce Development Program Services, by Race/Ethnicity and Gender and Service Type, 2008-19 Cohorts



Trends in service receipt across race/ethnicity and gender groups were similar among apprentices active in 2018-19 (Figure 11), with slightly higher rates of ready item receipt and slightly higher rates of gas/travel and child care receipt among white women among recently active apprentices. While women and people of color continue to receive services at higher rates than white men, the number of apprentices receiving services continues to be highest among white men: among apprentices active in 2018-19, 413 white men received services, compared to 98 Black men, 180 Latinx men, 15 Asian men, 41 Native men, 152 white women, 18 Black women, 29 Latina women, 8 Asian women, and 18 Native women.

Figure 11. Percent of Apprentices in Highway Trades Receiving Financial Services, by Race/Ethnicity and Gender and Service Type, Active 2018-19

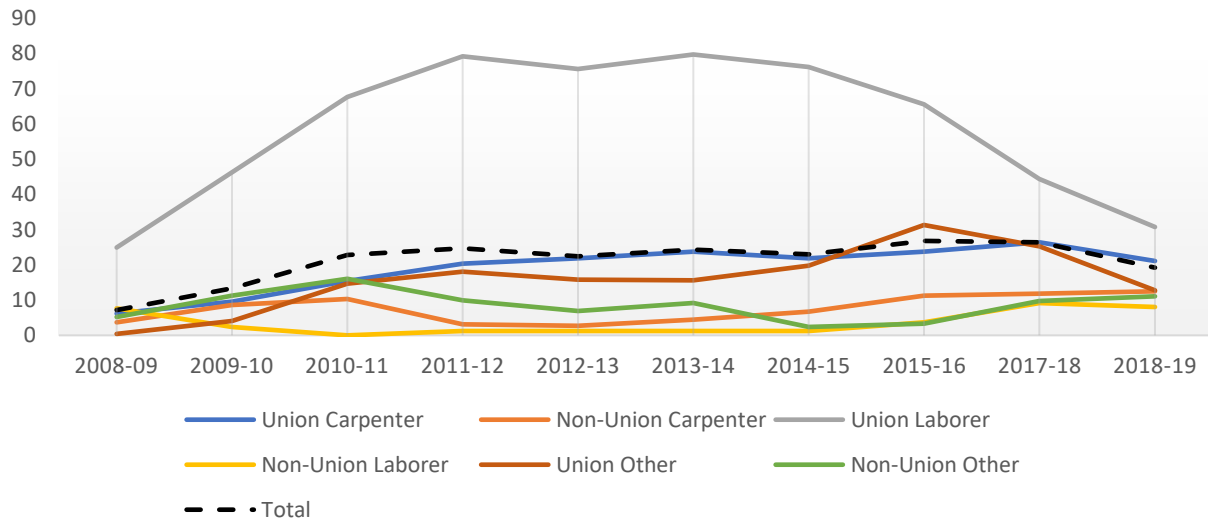


The percentage of apprentices receiving services also varies by trade (Figure 12), with service recipients over-represented among union laborers and under-represented among non-union laborers: among apprentices active in 2018-19 40% of union laborers and 6% of non-union laborers received services; among apprentices in cohorts 2008-2019, 51% of union laborers and 4% of non-union laborers received services. Apprentices in the carpenter trade, both union and non-union, are the next most likely to have received services, after union laborers.

**Table 3. Number of Apprentices in Construction Trades Served by Workforce Development Program, by Race/Ethnicity and Gender, Apprentices Active in 2018-19**

	White Men	Black Men	Latinx Men	Asian Men	Native Men	White Women	Black Women	Latinx Women	Asian Women	Native Women	Total
<b>Highway Trades</b>											
<b>Any Financial</b>	396	93	173	15	41	141	16	26	8	17	926
Ready Items	353	85	158	13	36	131	14	26	8	15	839
Gas or Travel	109	13	42	2	9	31	4	4	1	5	220
Child Care	42	7	16	1	7	22	1	4	0	4	104
Hardship	40	10	10	0	3	19	1	1	0	0	84
<b>Any Non-Financial</b>	28	9	13	0	2	28	4	7	2	3	96
Social Support	6	3	3	0	1	20	3	5	2	2	45
Budget Class	21	6	10	0	1	7	1	0	0	2	48
Nutrition Class	1	0	0	0	0	2	0	2	0	0	5
<b>Any Service</b>	413	98	180	15	41	152	18	29	8	18	972
Financial Only	385	89	167	15	39	123	14	22	6	15	875
Non-Financial Only	17	4	7	0	0	10	1	3	0	1	43
Both	11	5	6	0	2	19	3	4	2	2	54
<b>No Service</b>	2013	203	725	73	161	182	26	39	4	17	3443
<b>Non-Highway Trades</b>											
<b>Any Service</b>	11	0	13	0	0	18	0	0	1	3	46
Financial Only	3	0	1	0	0	0	0	0	0	0	4
Non-Financial Only	8	0	12	0	0	16	0	0	1	3	40
Both	0	0	0	0	0	2	0	0	0	0	2
<b>No Service</b>	5436	140	621	133	127	284	14	27	9	16	6807

Figure 12. Percent of Apprentices in Highway Trades Receiving Services by Trade, 2008-2019 Cohorts



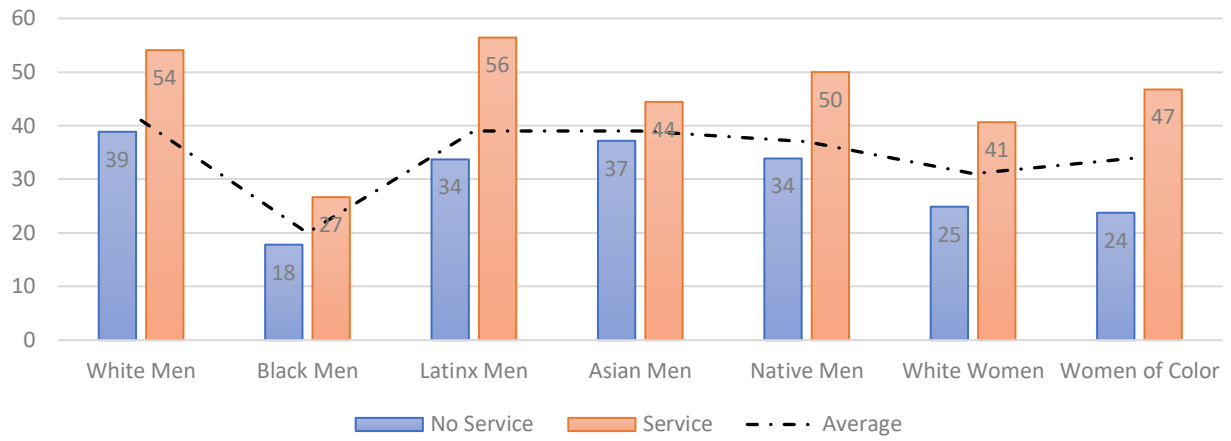
Importantly, the union laborers serve the largest percentage of apprentices, with 50% of union laborer apprentices in the 2008-2019 cohorts receiving some type of support service. This is compared to 20% of union carpenters, 8% of non-union carpenters, 4% of non-union laborers, 15% of union other highway tradespeople, and 8% of non-union other highway tradespeople. Given the positive impact of service receipt on completion, the strategy taken by the union laborers is likely effective at increasing the retention and completion of apprentices, especially women and apprentices of color. Research on persistence emphasizes the importance of feeling supported by and cared for by one’s institution (Bergman et al 2014; Mantz and Thomas 2003; Valansuela 1999). Connecting with apprentices by asking (and providing) what they need is one way to be responsive to apprentices’ needs and to generate a culture that emphasizes care.

*Effect of the Highway Construction Workforce Development Program on Completion*

**The Highway Construction Workforce Development Program continues to improve completion rates for apprentices in eligible trades who receive services.** Apprentices in eligible trades, in cohorts 2008-19 and those active in 2018-19, who received supportive services were more likely to complete an apprenticeship (Figures 13 & 14) and to complete an apprenticeship on-time (Figure 15), relative to those who did not receive services.



Figure 13. Percent of Apprentices in Highway Trades Completing by Service Receipt and Race/Ethnicity and Gender, 2008-2019 Cohorts



Figures 14. Percent of Apprentices in Highway Trades Completing by Service Receipt and Race/Ethnicity and Gender, Active in 2018-19

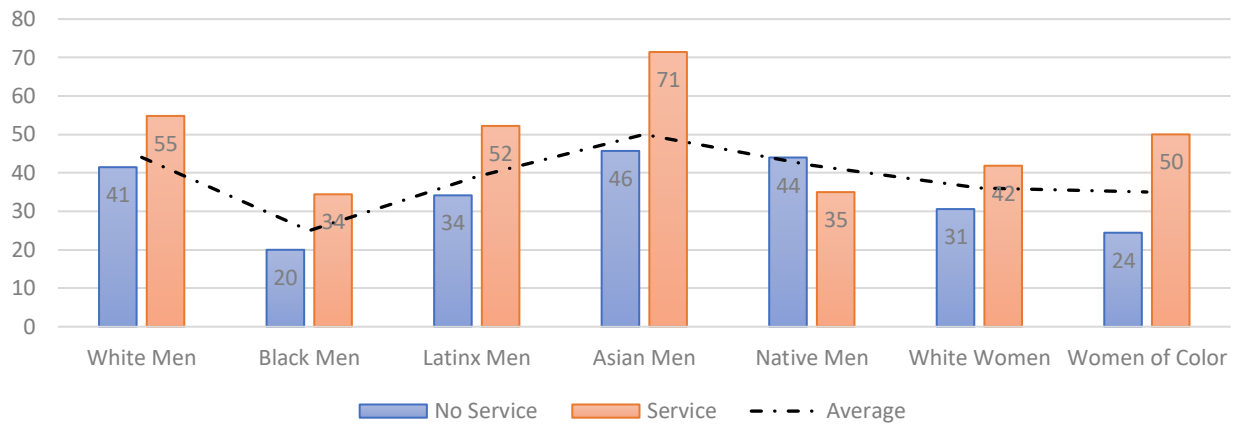
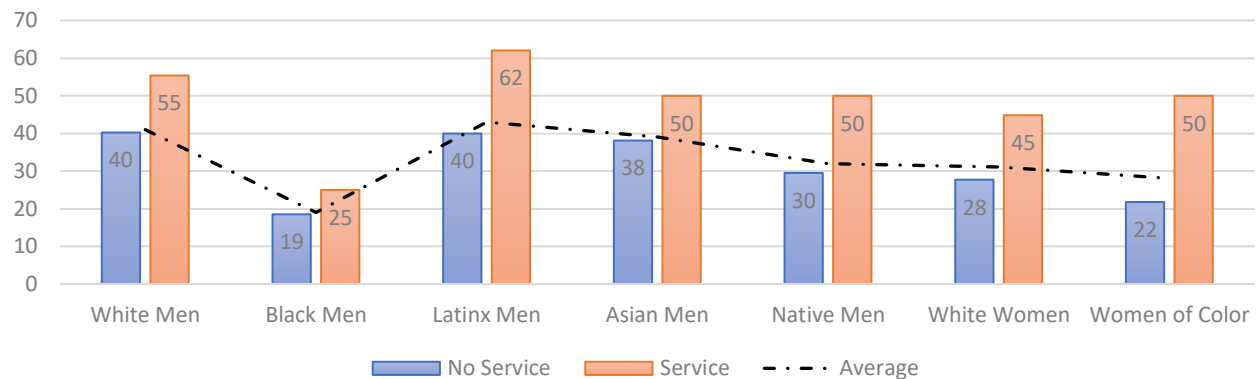


Figure 15. Percent of Apprentices in Highway Trades Completing On Time, by Race/Ethnicity and Gender and Service Receipt, Cohorts 2008-2013



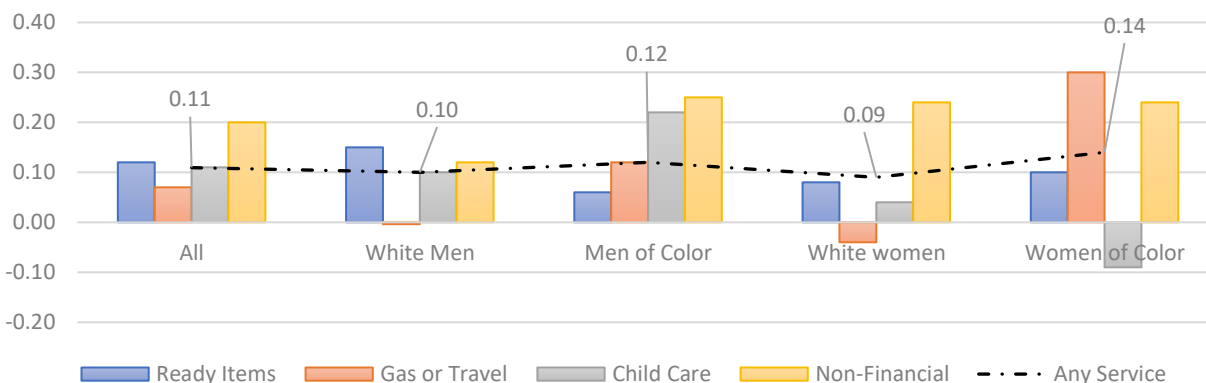
Importantly, the positive effects of receiving services remain after accounting for factors associated with both receiving services and completion, such as race/ethnicity, gender, age, trade and union status, prior credit, region, cohort, and whether or not an apprentice applied for services. **Among highway trades apprentices in the 2008-19 cohorts, on average, those receiving services were 11% (+/- 3%) more likely to complete their apprenticeship than those who did not receive services (Figure 16).** This average estimated effect did not vary, at a statistically significant level, across race/ethnicity and gender groups. There was variation in the estimated effect (both adjusted and unadjusted) of support services on completion across trades: relative to the effect among union carpenters, the effect of services was larger among union laborers and among those in other union trades. For example, among union laborers, the effect of receiving any service on completion was 0.21 (21% more likely to complete; +/- 8%), compared to an adjusted effect of 0.11 across all highway trades. Among apprentices active in 2018-19, the adjusted marginal effect of receiving supportive services was .07 (+/- .06): those receiving supportive services were 7% more likely to complete an apprenticeship than to cancel an apprenticeship, relative to those not receiving services, after accounting for other factors.

Among apprentices in the 2008-13 cohorts, the marginal effect of receiving support services on completing an apprenticeship on time was 0.14 (+/- 6%): apprentices receiving services were 14% more likely to complete an apprenticeship on time, relative to those not receiving services, even after for accounting for other factors associated with service receipt and on-time completion. This average estimated effect did not vary, at a statistically significant level, across race/ethnicity and gender groups or across trade.

Among all apprentices in the 2008-2019 cohorts, the independent effect of non-financial services on completion, adjusted for other types of services and factors associated with receiving services and completion, is larger than the estimated effects of receiving ready items, gas/travel, or child care (Figure 16). **Apprentices receiving non-financial services are 20% (+/- 8%) more likely to complete rather than cancel, relative to those not receiving services. Those receiving ready items are 12% (+/- 4%) more likely, those receiving gas/travel support are 7% (+/- 6%) more likely, and those receiving child care support are 11% (+/- 10%) more likely to complete.** Several differences in estimated effects of services across race/ethnicity and gender are statistically

significant in adjusted models: the effect of ready items is smaller among men of color, relative to white men, while the effect of gas or travel is larger among men of color and women of color, relative to white men. The estimated effect of child care or non-financial services does not vary across race/ethnicity and gender groups.

Figure 16. Estimated Adjusted Marginal Effects of Receiving Services on Completion by Race/Ethnicity and Gender, 2008-19 Cohorts



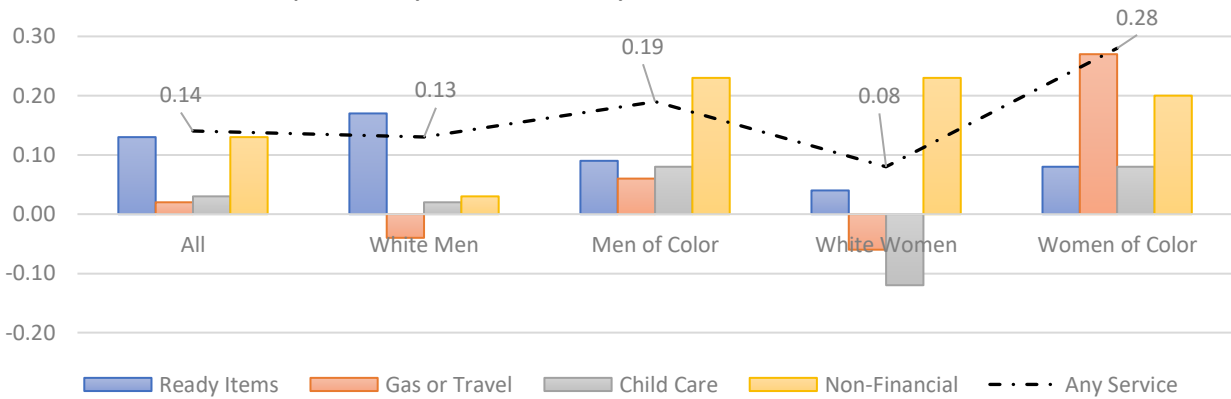
Among all apprentices in the 2008-2013 cohorts, the independent effect of non-financial services or ready items on completion is larger than the estimated effects of receiving gas/travel or child care (Figure 17). In fact, the adjusted estimated effects of gas/travel and child care are not statistically significant once other services are adjusted for, specifically, once receipt of ready items is controlled for. This suggests that the positive effect of child care on on-time completion is not directly due to child care supports but to the host of services and supports apprentices receiving child care supports are receiving from the program and program staff. It is important to note, however, that apprentices receiving child care, especially mothers, are likely different from those not receiving child care, in ways impacting both child care receipt and on-time completion and in ways we are unable to account for in models using OAS data. More analysis of apprentices receiving child care supports is needed, including a potential comparison between those applying for but not receiving child care and differences between mothers and fathers and by socio-economic status.

In previous surveys of apprentices, we found that mothers were more likely than fathers to report being single (40% vs. 11%) and were more likely to report an individual income below 226% of the federal poverty level. Mothers also reported a greater number of months out of work during their apprenticeship (1.9) than fathers (1.2). Mothers were more likely than fathers to rely on a paid child care provider or to state children were old enough to take care of themselves. In fact, 46% of fathers reported relying on a spouse or partner for child care, compared to only 18% of mothers. Not surprisingly, apprentices who are mothers appear to have fewer resources and to face more child care challenges than those who are fathers: mothers were more likely than fathers to report problems paying for child care and finding consistent child care (Wilkinson & Kelly 2018). While male apprentices were more likely than female apprentices to report having dependent children living with them during their apprenticeship in our 2016 survey (51% vs. 37%), men were more likely than women to depend on a spouse or partner for child care (36% vs. 7%),

reflecting the persistent gendered division of labor in which women are expected to work within the home whereas men are expected to work in the paid labor market (Kelly & Wilkinson 2016). In addition to gender as a factor impacting perceptions of child care challenges, household income was also identified as a factor in our 2016 survey: apprentices with household incomes less than \$30,000 were the most likely of all income groups to report the cost of childcare as a challenge (65%) and were also the most likely to report being out of work as a problem (64% vs. 34% for highest income group) (Kelly & Wilkinson 2016).

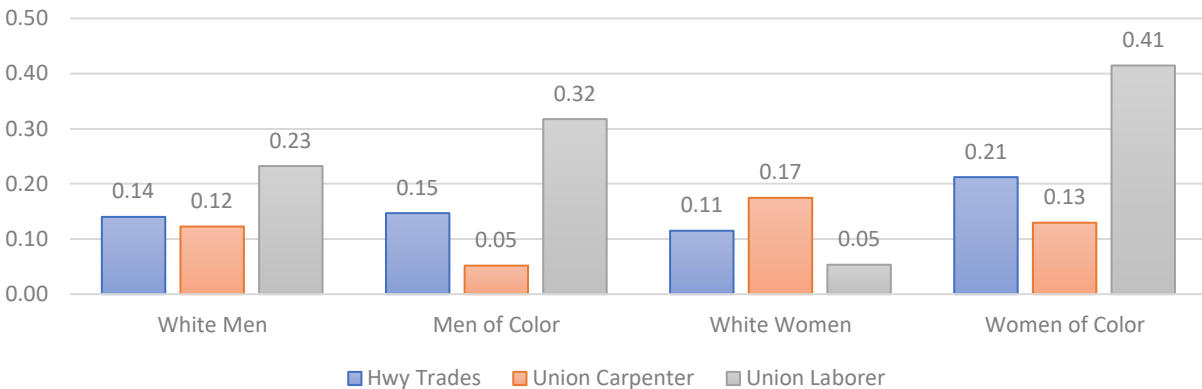
Apprentices receiving non-financial services are, on average, 13% (+/- 10%) more likely to complete on time, relative to those not receiving non-financial services. Those receiving ready items are 13% (+/- 8%) more likely to complete on time than those not receiving ready items. In general, differences in estimated effects of services across race/ethnicity and gender are not statistically significant in adjusted models, yet there is some evidence that the effect of gas/travel is larger among women of color, relative to white men, and that the effect of non-financial services is larger among men of color and women.

Figure 17. Estimated Adjusted Marginal Effects of Services on On-Time Completion by Race/Ethnicity and Gender, 2008-2013 Cohorts



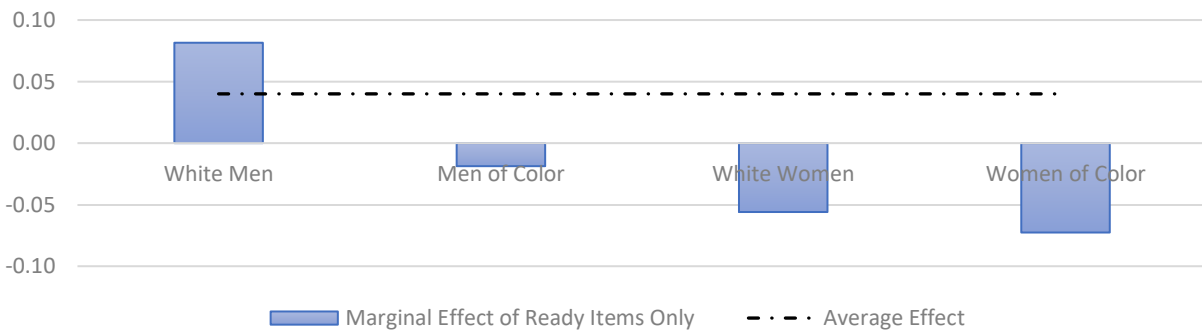
Some evidence suggests that women of color and men of color benefit more from services when in the union laborer trade (Figure 18). This pattern is not observed among white women, however. Perhaps the over-representation of, for example, women of color in the union laborer trade increases the efficacy of services in this trade. More research should examine possible effects of proportion of marginalized groups in a trade on completion and efficacy of services. From a policy perspective, it might be worth examining the tradeoffs of channeling women and people of color into trades that have historically high proportions of historically marginalized groups or of attempting to get a larger percentage of women and people of color into trades that have historically had lower proportions of marginalized groups.

Figure 18. Estimated Adjusted Marginal Effects of Receiving Services on Completion by Race/Ethnicity and Trade, 2008-19 Cohorts



Because ready items are the most common and often the first service that apprentices receive, we examined the estimated effect of receiving only ready items, across race/ethnicity and gender groups. As seen in Figure 19, the positive effect of ready items on completion, among apprentices in 2008-19 cohorts, is primarily driven by white women. Women and men of color appear to experience no positive effect of receiving only ready items. This finding, in combination with findings that non-financial support services have a larger positive effect among women, suggests that multiple services, including non-financial services, are critical to effectively serving historically marginalized groups in the trades. Similarly, **estimated effects of receiving non-financial only or both financial and non-financial services on completion are larger than estimated effects of receiving only financial services.** While the difference is not statistically significant, estimates suggest that receiving both financial and non-financial services has a bigger positive effect on completion among men and women of color than among white men and women.

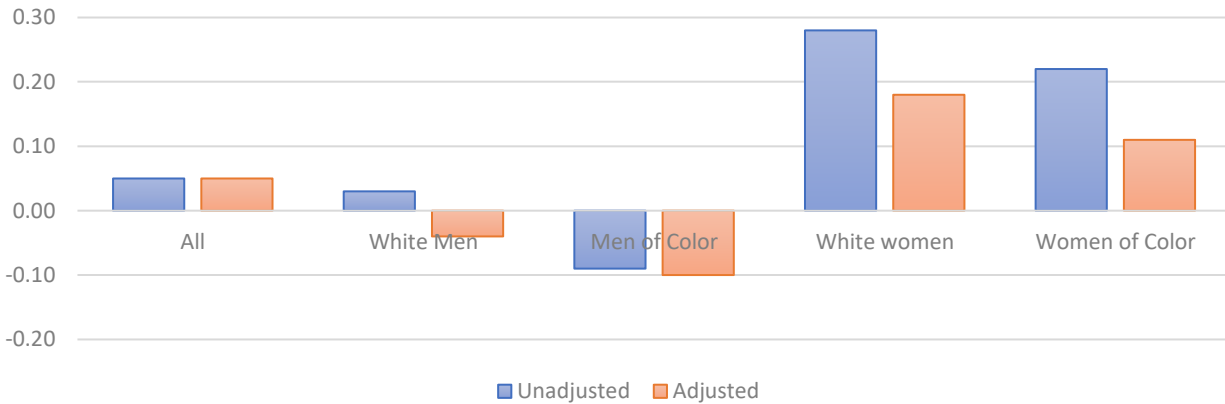
Figure 19. Estimated Adjusted Marginal Effects of Receiving Ready Items Only on Completion by Race and Gender, 2008-19 Cohorts



Completing a pre-apprenticeship has a positive effect on completion among women (especially among white women) but not among men (Figure 20). This finding mirrors findings from previous reports and is not surprising given the unique challenges faced by many men participating in pre-apprenticeship programs. As an example, a recent study of pre-apprenticeship programs found that nearly half of all recent participants in Constructing Hope’s pre-apprenticeship program (which primarily serves men) had a criminal history and half were receiving public assistance (Wilkinson

and Kelly 2017). Pre-apprenticeship programs such as Constructing Hope attract workers with challenges that make it difficult to complete an apprenticeship program. Results from our 2018 survey show that 79% of respondents completing a pre-apprenticeship program reported an individual income below 226% of the poverty level before they began their apprenticeship (CITE).

Figure 20. Unadjusted and Adjusted Marginal Effects of Pre-Apprenticeship on Completion, by Race/Ethnicity and Gender, 2008-19 Cohorts



### *Apprentices’ perception of the impact of financial support from the Highway Construction Workforce Development Program*

In this section, we review how financial supports from the workforce development program (ready items, travel, hardship, and/or childcare) helped apprentices complete their apprenticeships.

**Ready items** Many reported that the help they received for purchasing ready items was critical to their success as they started their apprenticeship. As one apprentice noted: **“I wouldn’t have been able to do it without the BOLI [sic] program”** (multiracial woman, completed).<sup>1</sup> Participants not only valued the ready items they received, but they also appreciated the advice they were given about tools, clothing, and PPE through working with Penny Painter, the administrator contracted to deliver services for the Program (see Appendix E). A few apprentices noted that the support was helpful but not critical, for example: **“[If I hadn’t received that help] I’d say [it would have been] a minor problem. I still could’ve gone out and purchased them myself, but that’s money that could have been spent saving up for the house or making the truck payment. So it enabled me to use that money for other things”** (white man, completed).

**Travel.** Four completed and two cancelled apprentices received support for travel (e.g. gas, hotel, meals). Some participants found this type of support very helpful, for example: **“Yes, there was a couple of times where I didn’t have very much work. So it helped a lot, being able to get**

<sup>1</sup> While the Workforce Development Program is jointly funded by the Bureau of Labor and Industries (“BOLI”) and the Oregon Department of Transportation (ODOT), some participants referred to it as the “BOLI program.” Other participants referred to it as the “Penny Painter program,” referencing one of the administrators contracted to deliver services.

**that gas assistance. And it would have been a huge problem without it. I wouldn't have made it to work”** (white woman, cancelled). For others, the limited funds available for travel were problematic for those who had to work out of town for extended periods. For those who worked out of town for extended periods of time, even regular paychecks were not sufficient to maintain the expenses of their household as well as cover the expenses of living away from home. The cost of travel and the associated difficulties of being away from home for long periods was a major challenge for three of the ten cancelled apprentices.

*Childcare.* Of the six interview participants who received child care subsidies, all reported that the support was helpful and all three of the cancelled apprentices who received childcare subsidies left their apprenticeship for reasons other than the cost of childcare. Two completed apprentices specifically cited the childcare subsidy as key to their success. As one apprentice stated: “[**The child care subsidy was] extremely helpful. It really helped make the case to my partner that the sacrifices we were making were worth it and that my union cared about all of that. It was hugely helpful... I don't know that I would've made it probably to where I'm at now without that, for sure”** (white man, completed). For some apprentices, the childcare subsidy alleviated all challenges with affording childcare. Other apprentices struggled with affording childcare after the funds from the Program were used. For example, Louisa used the childcare subsidy early in her apprenticeship; at the time she was interviewed, she said “**We can't afford childcare. So my significant other's mom watches the kids. Because it's just too expensive and it's not, we can't do it. No”** (white woman, completed).

*Hardship funds.* Four apprentices in this study received hardship funds, including two completed apprentices and two cancelled apprentices.<sup>2</sup> These apprentices received support when they had an unexpected cost associated with transportation or housing, for example: “**I had an instance where I was laid off and unemployment wasn't kicking through for me at the time, so I had needed help with rent assistance. And I talked to Penny Painter and she got me in line through the BOLI [sic] program, and I was able to pay my rent so I can stay where I was living at”** (multiracial woman, completed). For the cancelled apprentices, hardship funds allowed them to continue in their apprenticeships. Ultimately, they left the trades for reasons not associated with the financial challenge that led them to request hardship funds.

### *Apprentices' perception of the impact of non-financial support from the Highway Construction Workforce Development Program*

**Only four interview participants were recorded by BOLI as receiving non-financial support as part of the Highway Construction Workforce Development Program by the Agency. However, when interviewed, 20 of 26 interview participants reported receiving some non-financial support from the Program.** Participants reported that non-financial support from the Program primarily came from Penny Painter, the administrator contracted to deliver services for the Program; some apprentices reported receiving non-financial support from the pre-apprenticeship programs Oregon Tradeswomen and Constructing Hope.

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<sup>2</sup> The hardship funds are administered by the Labor's Community Services Agency via a subcontracted by Akana, an organization that is contracted to administered the Highway Workforce Development Program.

**Pre-apprenticeship.** Among interview participants, four completed the Oregon Tradeswomen program, two completed the Constructing Hope program, and one completed the Carpenter Trade Preparation program. Additionally, one reported participating in the Anatomy of a Bridge program between a pre-apprenticeship and apprenticeship program.<sup>3</sup> One interview participant described how Constructing Hope provided both non-financial as well as some financial support: **“On top of essentially giving me the knowledge, skills, with each and every different trade that they presented to me, they also provided me the steel toe boots that I didn't have and a hard hat”** (multiracial man, completed). Three interview participants reported that they received ongoing support from Oregon Tradeswomen while they were apprentices, for example, **“I went to every single social hour I could manage in the first several years of my apprenticeship because I needed their help. I almost quit. Between Oregon Tradeswomen and one of my very favorite people in the [trade] union, I stayed”** (white woman completed).

**Budget class.** Several participants reported taking the budget class with Penny Painter and viewed it as useful. As one apprentice said: **“It made me really look at my finances and where my money was going from working”** (white woman, cancelled). Another apprentice reported: **“The content of the course had some good personal finance stuff in it that was good. Good reminders. It was good to take it with my wife”** (white man, completed).

Box 1: The Penny Painter Effect

“...I will say that Penny was the most amazing person, that if it wasn't for her, I wouldn't have stayed in the construction industry, to be a hundred percent honest. If it wasn't for Penny, I wouldn't be working for the union... When I had first started, I was having that problem with the racial experience [racism on the job site]. And she was explaining to me, and talking to me about stuff, and how we don't have a lot of minority leaders in leading positions, and how that sometimes we have to go through hard stuff. And at the end of it, it all is worth it, and sometimes it's not. But you'll never know if you just stop. And she told me that she had this money to help me get the clothes, and she helped me buy my boots. I didn't have money for steel toed boots. I was working in the rain and I didn't have any rain gear. I was soaking wet every day and just miserable, and she made sure that I had everything that I needed for that year. And it really changed my perspective on them, on the union, and how to go about life” (Black man, completed).

**The Penny Painter effect.** In addition to the formal budget class offered through the Program, apprentices received support from Penny Painter in the form of advice, listening, encouragement, and referrals to other organizations. The non-financial support was provided by phone, text, and in-person meetings related to receiving financial support. Many apprentices spoke very highly of the support they received from Penny Painter, for example: **“She was just like a mentor. Anytime I just needed to talk or anything, she was there. She was super amazing”** (white woman, cancelled). Another apprentice talked about how both the financial and especially the non-financial services provided through the program helped him persist in his apprenticeship despite experiencing significant racism (see Box 1). Narratives from interview participants demonstrated

<sup>3</sup> The Anatomy of a Bridge program is a trades pre-apprenticeship that can result in advanced standing for completers who enter the union carpenter program.



how Penny Painter provided non-financial support that related to the financial support (e.g. advising apprentices on what kinds of ready items they needed and why) but also providing more general advice and connecting apprentices to other services.

### Financial and non-financial support from other sources

In Table 4, we present the additional sources of support reported by apprentices. In the following sections, we provide some detail on the most commonly experienced types of supports and how they impacted participants’ ability to be successful in their apprenticeship.

Table 4 Sources of support received by apprentices (most to least frequently reported)

Financial support	Non-financial support
Unemployment	Partner
Family/friends	Family/friends
Public assistance	Tradespeople/coworkers
Employer	Union staff
Apprenticeship	Apprenticeship staff
Union	Employer staff
	Church, faith, God
	Other non-profit

Note: Questions about church, faith, or God and other non-profits were not asked to all participants but were mentioned by some participants when asked about any other supports they had experienced.

### Impact of financial support from other sources

In assessing the sources of financial support completed and cancelled apprentices accessed, we found that apprentices who completed their apprenticeship were more likely to have received support from unemployment and from family or friends. Cancelled and completed apprentices were similar in their access to all other types of financial support.

**Unemployment.** The majority of apprentices accessed unemployment benefits during periods where they were out of work or attending classes. As one apprentice noted **“Yeah, [unemployment is] absolutely necessary with the way the classes were structured. If it wasn't for that, missing a week of work would be very difficult”** (white man, completed). Apprentices who did not access this support were either not eligible or lacked knowledge about how to claim unemployment, for example: **“The only thing I didn't know about was that doing it during your class week. Because you have to be there [at class] all week and you don't get paid”** (white woman, completed). Another apprentice reported not having access to unemployment because she had been in prison prior to her apprenticeship.

**Family and friends.** Half of interviewed apprentices reported receiving financial help from family or friends. Several noted that the financial assistance was in the form of providing free childcare, assistance with rent, food, and other household expenses, for example: **“I would say I got a little help from my parents... When I would need a babysitter for my kids, they would help me out with my kids, and there was this one time that I needed money, and they lent me some money”** (Latino, completed). Given the financial challenges of apprenticeship, having family and friends who can provide financial support is a clear advantage for some apprentices.

*Public assistance.* Eleven of the 26 interviewed apprentices reported receiving public assistance as an apprentice, most commonly food stamps with two apprentices receiving subsidized housing. For individuals who were receiving public assistance prior to their apprenticeship, the financial challenges were heightened.

*Employer.* A few participants reported some financial assistance (beyond their wages and benefits) from employers; this took the form of ready items and paying for travel expenses. Several apprentices noted there was a lot of variation in the degree to which companies provided the tools, clothing, and PPE required for the job, for example: **“Some companies, they supply everything. If I'm going to [do a specific task on] a day, they'll supply me with my boots, and they'll supply with gloves and gear to keep safe. But then there's some companies that don't, and that is, it is difficult when you're first starting off”** (Black man, completed). Some apprentices noted that their supervisors personally provided financial support, for example, **“One of these dudes, he wanted me to go to a different job and I didn't have gas money. He gave me money for gas to get to the job, but there's that one time”** (white man, cancelled).

*Apprenticeship and union.* Apprenticeship programs and associated unions provided some financial support to apprentices, also in the form of ready items, support for travel, books, and (in one case) \$100 in union dues. As one apprentice commented: **“I will say buying [ready items], it does get pretty expensive, but the apprentice program does pretty well with getting your basic essentials for you... [But] a lot of different companies expect certain things. It just all depends. But I will say that, working in this industry, you do have to have a good amount of money upfront to get started”** (Black man, completed).

#### *Impact of non-financial support from other sources*

In comparing access to non-financial support, apprentices who completed were more likely than those who cancelled to receive support from every source. The largest differences were for support from family and friends, apprenticeship staff, and employer staff.

*Partner.* All partnered interview participants noted that their partners provided some support during their apprenticeship. Most commonly this was in a general way, for example, listening to complaints and offering advice. As one apprentice described: **“I wouldn't be here today without [support from my partner]. She's my rock, you know? She's what keeps me going even when I don't think I have any more to go with”** (white man, completed). Both male and female apprentices with female partners (but not female apprentices with male partners) noted specific kinds of non-financial support their female partners provided: making lunches, budgeting, coordinating child care, driving them to work, and laundry. Paul, quoted above, was one of three male apprentices to describe their female partners as “my rock”; none of the female participants with male partners reported this level of support.

*Family and friends.* The majority of apprentices reported some degree of non-financial support from family, friends, and partners. These sources of support from outside the trades provided encouragement and listened to complaints, for example: **“My family was always really supportive and proud of my choice to join the union”** (white woman, completed) While family and friends offered general support and encouragement, it seems that support from within the

industry was particularly helpful. As one apprentice noted “[the non-financial support from family and friends was] mostly like an encouragement, but just a little. I wasn't necessarily always open with what the struggles were because it's difficult to be vulnerable and ask for help. But also it's difficult to ask for job site specific help from somebody who doesn't understand how the trades kind of operate” (white woman, completed).

*Tradespeople.* The majority of interview participants reported receiving some non-financial support from tradespeople; while tradespeople offered the same types of general support as family and friends, they also offered advice and knowledge specific to the trades, making this a particularly valuable source of support. Many interview participants noted having one or more mentors who provided support on the job, for example: “**I got a lot of good mentorship from coworkers. I worked with some really good journeymen and foremen and people that took me under their wing**” (Will, white man, completed). Another apprentice also reported the role of support from tradespeople in their decision to stay in the trades: “**A couple of journeymen, they supported me a lot while I felt like giving up at times**” (multiracial woman, completed).

*Union and apprenticeship staff.* Interview participants reported receiving non-financial support from apprenticeship coordinators, instructors, dispatchers, union reps, and other staff of apprenticeship programs and unions. This support took the form of providing advice, encouragement, knowledge, help resolving on-the-job harassment, and referrals to other sources of support, including the Highway Construction Workforce Development Program. One participant described receiving support from two organizations specific to her trade: Sisters in the Brotherhood and Carpenters in Action. Another apprentice pointed to the examples of additional optional classes provided by the apprenticeship as a source of support. Several participants named a specific person who had helped them, for example: “**The reason I'm still [working in this trade] is a guy that I text every day just to keep my head on straight. He's my mentor. I do text him every day**” (white woman, completed). While many apprentices reported receiving one-on-one support from apprenticeship and union staff, some wished they had more access to these individuals. One apprentice noted, “**Like there was a lot of stuff that I didn't really get a clear view of for a good while. Like if I'd had a mentor who was willing to speak frankly with me, that would have probably been incredibly helpful. But I did not. Like you learn a lot from the apprenticeship staff, but you don't necessarily get one-on-one personal conversation time with them**” (white woman, completed). Several interview participants observed that these staff members were very busy and had to support many apprentices.

*Employers.* When asked about non-financial support from employers, many interview participants reported on how coworkers (especially those supervising them) provided support. Other apprentices described how employer policies and practices (rather than the actions of individuals) supported them during their apprenticeship. One apprentice described employers who ensured on-the-job learning opportunities to her as an apprentice as providing needed support. Interview participants reported that employers also provided support to apprentices by appropriately responding to job site harassment and discrimination, for example, “**I did end up telling my boss and my boss immediately released the guy**” (Black woman, cancelled). The failure of employers to appropriately respond to harassment and discrimination exacerbated the problem for apprentices, for example: “**when I complained about it to my boss, my boss didn't take him off the job, didn't give him any time off. My boss acted like he was taking it seriously. He was,**

**‘Oh, that's really bad. I can't believe he would say that to you. Blah, blah, blah.’ Whatever. But then this guy ultimately didn't even really get in any kind of trouble for it”** (white woman, completed).

### Recommendations

Overall, pre-apprenticeship and supportive services funded by the Highway Construction Workforce Development Program are increasing the recruitment and retention of a diverse workforce and these efforts should be continued.

Pre-apprenticeship remains, to date, the only approach that has been empirically documented to increase the recruitment of women into the trades in Oregon (the impact of other approaches, such as school outreach and women in trades fairs has not been assessed). Between 2008 and 2019, 16% of white women and 20% of women of color entered into apprenticeship via pre-apprenticeship.

Financial services have a positive impact on completion and should be continued. Those receiving ready items are 12% more likely to complete rather than cancel, relative to those not receiving services, those receiving child care support are 11% more likely, and those receiving gas/travel support are 7% more likely to complete. The findings of this evaluation demonstrate that these financial services are even more effective when paired with non-financial services. Receiving ready items is a particularly important service because it has the largest impact on completion of all financial services types *and* it connects apprentices with the Program early on in apprenticeship, which creates opportunities for Program staff to also provide non-financial support throughout the apprenticeship. Gas and travel support are the least effective service; funds might be more effectively used to provide non-financial support.

#### Box 2. Non-financial support needed to improve retention

- How to stay consistently employed
- How to budget, apply for unemployment, and access other financial supports within and outside the trades.
- How to respond to harassment and discrimination and/or advice about how to communicate with employers and/or apprenticeship programs about the challenges of their current job assignment
- How to access mentorship and on-the-job training and/or advice about how to communicate with their employers and/or apprenticeship programs about the challenges of their current job assignment and ask for a rotation if needed
- How to communicate with their employers and/or apprenticeship programs about the challenges of working out of town and ask for a rotation

As non-financial services have the biggest impact on completion, we recommend more funding should be directed towards this type of service. Among all apprentices in the 2008-2019 cohorts, those receiving non-financial services are 20% more likely to complete rather than cancel, relative to those not receiving services. In the 2020 interviews, we identified unmet needs that could potentially be addressed through non-financial supportive services (see Box 2). However, many of these issues are better addressed at a structural level (see Box 3).

These findings suggest that many apprentices would benefit from “wrap-around” services that connect apprentices with financial and non-financial support available through the Highway Construction Workforce Development Program as well as additional support available within the trades and in broader communities.

The lost investment in cancelled apprentices is considerable, as an example, the union carpenters estimate the lost investment is \$55,000 for apprentices who terminate in the first year and \$100,000 for those who terminate in the second year (personal communication). Ultimately, a relatively small additional investment in financial and non-financial supportive services to promote retention will result in overall savings for the industry.

Interviews conducted for the 2020 evaluation also provide some additional insight into how the retention of apprentices might be better supported through structural changes to the apprenticeship system (see Box 3). These recommendations are consistent with the recommendations from our 2018 report (Wilkinson and Kelly 2018) as well as the recent Metro Market Study (2018).

#### Box 3. Structural changes to improve retention

- Revise current processes for assigning work to ensure equal access to on-the-job hours for women and people of color.
- Promote respectful workplaces through employer policies and worker training.
- Create a system for reporting harassment and discrimination across job sites.
- Promote teaching and mentorship through employer policies and worker training.
- Provide opportunities for apprentices to rotate out of jobs where they are not learning the skills of the trade.
- Provide opportunities for apprentices to rotate out of jobs that require long hours, are far from home, not ideal schedules, or are otherwise not a good fit.
- Require employers to pay for apprentices’ travel expenses for out of town work.

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## APPENDIX A. Research Design

### *Interviews*

Table A1. Interview demographics

<b>Completed/Cancelled in 2018-2019</b>	<b>N</b>
Completed	16
Cancelled	10
<b>Race</b>	
White	14
Black or African American	4
Hispanic or Latino	6
Multiracial	2
<b>Gender</b>	
Men	16
Women	10
<b>Sexual identity</b>	
Straight	21
Gay, lesbian, bisexual, or something else	5
Refused	1
<b>Family type</b>	
Single with no children	2
Partnered with no children	8
Single with children (part time custody)	3
Single with children (full time custody)	2
Partnered with children (full time custody)	11
<b>Age</b>	
Average age	34
<b>Pre-apprentice services</b>	
Oregon Tradeswomen	4
Constructing Hope	2
Carpenter Trade Preparation	1
<b>Apprenticeship services</b>	
Ready supplies (tools, clothing, PPE)	24
Travel (gas, hotel, food)	6
Childcare (including ERDC)	6
Hardship funds	5
Non-financial support (reported by BOLI)	4
Non-financial support (reported by participants)	20
<b>Trade</b>	
Carpenter	12
Exterior/interior carpenter	8
Laborer	4
Cement mason	1
Painter	1

N=26

The population for the interview sample included all Oregon apprentices working in eligible trades who had received services from the program and either completed or cancelled their apprenticeship in 2018 and 2019 (a total of 175 individuals). Names and contact information for these potential participants was provided by the Oregon Bureau of Labor and Industries. A nonrandom stratified sample was used in order to ensure representation from both completed and cancelled apprentices, men and women apprentices, and white apprentices and apprentices of color. A total of 30 interviews were conducted; two were excluded from the analysis because of issues with the audio recording and two were excluded because when interviewed, the apprentices were active rather than cancelled as indicated in the administrative data. 26 interviews made up the final sample included in this analysis.

All interviews were conducted via the phone by a member of the Portland State research team in April and May of 2020. The research design initially called for in-person interviews in the Portland and Salem areas and phone interviews for participants outside driving distance. However, COVID-19 emerged as we began the project, necessitating all interviews be conducted over the phone. Interviews were an average of 28 minutes and ranged from 16 to 48 minutes. Interviews were audiotaped and transcribed. The demographics of the interview sample are shown below.

The interview guide focused on 1) financial and non-financial challenges experienced by apprentices; 2) financial and non-financial support from the program; and 3) financial and non-financial support received from other sources. The data was analyzed using the qualitative coding software Dedoose. The goal of the analysis was to determine how the program had helped apprentices overcome challenges, which elements of the program were most helpful, and what additional supports are needed to further improve the recruitment and retention of a diverse workforce in the construction trades.

### *Administrative Data*

Data from the Oregon Apprenticeship System (OAS) database of current and past apprentices was used for this study. For trend analysis of enrollment rates between 2005 and 2019, all apprentices in the 2005-2019 cohorts who did not cancel with zero credit hours accumulated were included (N=23,180). This includes 16,845 white men, 916 Black men, 2,615 Latino men, 417 Asian men, 672 Native American men, 1,275 white women, 135 Black women, 157 Latina women, 41 Asian women, 99 Native American women, and 8 apprentices missing on race/ethnicity and/or gender. Of these 23,180 apprentices from the 2005-2019 cohorts, 9,968 (43%) were in eligible highway construction trades, including those in the carpenter trades (carpenter, exterior-interior specialist, pile driver, scaffold erector, millwright), cement mason, ironworker, laborer, operating engineer, and painter. For trend analysis in percent completing by race/ethnicity and gender, we included all apprentices who completed in each year, 2010-2019.

For analysis of completion rates by receipt of ODOT/BOLI support services, we included all apprentices in the 2008-2019 cohorts in eligible trades who had completed or cancelled by 2019 and who did not cancel with zero credit hours accumulated were included (N=5,457). We also examined completion rates by receipt of ODOT/BOLI support services among apprentices active in 2018-19. For these analyses we included all apprentices active in 2018 or 2019 in eligible trades who had completed or cancelled by 2019 and who did not cancel with zero credit hours accumulated (N=2,286). For analyses examining on-time completion rates, we included all apprentices in eligible trades in cohorts 2005-2013 (N=4,157). Calculation of on-time completion



varied by trade and was based on [guidelines](#) determined by the Department of Labor. On-time completion is calculated by dividing the total number of apprentices in the cohort who complete program requirements on or before one full year after the program's expected completion date (ECD) by the total number of registered apprentices in the cohort with an ECD for a set period of time plus one full year, minus the total number of apprentices in the cohort who exited the program during the probationary period. To determine eligibility for ODOT/BOLI financial supportive services, we used information on apprentice trade. Apprentices in the following trades were considered eligible: carpenter, cement mason, ironworker, laborer, operating engineer, and painter

For analyses of apprentices in the current reporting period, apprentices in the 2005-2019 cohorts active between January 1, 2018 and December 31, 2019 who did not cancel with zero credit hours accumulated were included. This included 11,268 individual apprentices. Of these 11,268, 4,415 were in eligible highway trades, including 157 (4%) women of color, 332 (8%) white women, 1495 (34%) men of color, 2425 (55%) white men, and 10 apprentices missing on race/ethnicity and/or gender information.

In cases where apprentices had multiple agreements, the average or sum of their characteristics was taken. For example, when determining completion of an apprenticeship, the sum of all agreements completed was used to create a dichotomous variable indicating whether the apprentice completed one or more agreements. Thus, the unit of analysis is apprentices, not apprenticeship agreements.

## **APPENDIX B. Interview Guide**

“Hello, my name is [name] and I’m a researcher at Portland State. I’m calling today because I’m doing an evaluation of BOLI/ODOT supportive services, and I would like to invite you to participate in one interview which will take about 30 minutes, and you will receive a \$50 gift card for your time. Your participation is voluntary, confidential, and won’t affect your employment. Is now a good time or would you like to schedule another time to do the interview over the phone?”

[If yes] Great. I have some additional information to share with you before we begin. This will take just one minute for me to read through.

We are doing an evaluation of the Oregon Bureau of Labor and Industries and Oregon Department of Transportation, that’s BOLI and ODOT, supportive services program, which is intended to improve retention of apprentices. This project is funded by BOLI and ODOT and is conducted by Portland State University researchers, that’s me.

You will be asked to complete this telephone interview, which will take about 30 minutes. Your participation is voluntary, you don’t have to answer any questions you don’t want to answer, and you can stop at any time. By continuing with the interview, you give your consent to participate in the study and you will receive a \$50 gift card.

Benefits of the study include contributing to research that will potentially improve the experiences of workers in the construction trades. Risks to participating in the study are minimal, for example, thinking about negative past or future experiences at work.

Portland State researchers will keep your answers to this interview confidential to the fullest extent possible. Only the researchers conducting the project will have access to your answers. Any identifying information will not be shared with BOLI, ODOT, or your employer or included in reports from this study.

If you have concerns or problems about your participation in this study or your rights as a research subject, I can provide you with phone numbers to call [if requested: Portland State Office of Research Integrity: 503-725-2227, PI Kelly: 503-725-8302].

Would you like an Amazon or a Fred Meyer gift card?

What is your email (Amazon) or mail (Fred Meyer) address?

Do you have any questions for me before we begin?

Great, I'm going to turn on the audio recorder now.

1. How did you get into the trades?
  - a. **[If pre-apprenticeship]** Which one? How helpful was that program in preparing you for your apprenticeship?
  - b. Did you work in the trades prior to your apprenticeship?
  - c. When did you start your apprenticeship?
2. What is/was your trade?
3. **[If left apprenticeship]** Ask:
  - a. Why did you leave the apprenticeship? **[clarify if needed]** did you choose to leave or were you asked to leave
  - b. Are you currently working? **[If no]** Were you working before the quarantine?
  - c. **[If yes]** what is/was your job? **[clarify if working in the trades or not]**
4. **[If completed apprenticeship]** Ask:
  - a. Are you working now? **[If no]** Were you working before the quarantine?
  - d. What is/was your job? **[Clarify if working in the trades or not]**
5. What is your age? (now)
6. What is your race or ethnicity?
7. What is your sexual identity: straight, gay, or something else?

Great, now I have some questions about your experiences during your apprenticeship.

8. During your apprenticeship, were you living with a spouse or partner? **[clarify if this changed over the apprenticeship]**
  - a. **[If yes]** Were they working?
  - b. What kind of work did they do?
  - c. What kind of schedule did they work: 9-5, nights, something else?

9. During your apprenticeship, did you have children under 18 living with you? **[include only kids they are responsible for; clarify if this changed over the apprenticeship]**
  - a. How many and ages (now)
  - b. Was your child(ren) living with you full time or part time?
  - c. Who cared for you children while you were at work? Paid/unpaid? **[Probe for all: school, after school programs, spouse/partner, unpaid family or friends, paid childcare providers]**
10. What were the best parts of your apprenticeship?
11. What were the most challenging parts of your apprenticeship?
12. Now I'm going to ask about challenges that apprentices sometimes face. What about **[read each item below]** was that a challenge at any point in your apprenticeship? Please tell me if it was a major problem, a minor problem, or not a problem.
  - a. Buying tools, clothing, and PPE
  - b. Paying for travel to work out of town (hotel, food)
  - c. Paying for gas to get to and from work or classes
  - d. Having reliable transportation
  - e. Having a drivers' license
  - f. Earning low hourly wages
  - g. Being out of work too long between jobs
  - h. Being unfairly among the first to be laid off
  - i. Being unfairly assigned fewer work hours
  - j. Difficult coworkers
  - k. Job site harassment or discrimination **[If yes probe for experiences]** Can you tell me a little about what you experienced?
  - l. Not learning the skills of the trade or a lack of mentorship on the job site **[If yes probe for experiences]** Can you tell me a little about what you experienced?
  - m. Affordable housing
  - n. Trouble in family relationships **[clarify if asked: such as a divorce, breakup, domestic violence, child custody, or anything like that]**
  - o. **[If kids]** Finding affordable and reliable childcare **[clarify if needed: was the problem cost, availability, and/or hours]**
13. Was there anything else that was a challenge during your apprenticeship?
14. The next questions are about support you received during your apprenticeship from the BOLI Supportive Services Program. You probably talked to Penny Painter from Akana. According to our records you received **[name first type of support]** does that sound right? **[If yes]** 1) How helpful was that? 2) How much of a problem would it have been if you didn't receive this help?
  - a. Child care subsidy as a pre-apprentice [prearcc2]
  - b. Child care subsidy as an apprentice [arcc2, backup, employer]
  - c. Tools, clothing, or PPE [ready2]
  - d. Help with paying for a hotel for out of town work [lodging2]
  - e. Help with paying for meals for out of town work [per diem]
  - f. Gas assistance [fuel2]
  - g. Hardship funds

- h. **[Ask everyone]** Calls, texts, or meetings with Penny Painter from Akana? **[Probe for what help Penny provided]**
  - i. [A budget class with Penny Painter? **[Probe for what kind of support this provided and how it helped]**
    - a. Support from Oregon Tradeswomen? **[Probe for what kind of support this provided and how it helped]**
    - b. Support from Constructing Hope **[Probe for what kind of support this provided and how it helped]**
15. Would you recommend any changes to the BOLI Supportive Services Program?
16. We would like to know if you received any (other) financial help during your apprenticeship. How about from your **[read each item below]**, did you receive any financial help from them? **[If yes]** 1) what kind of help did you receive? 2) How did it help?
- a. Apprenticeship program
  - b. Union
  - c. Employer
  - d. Family or friends
  - e. Unemployment
  - f. Public assistance, such as food stamps, cash assistance, housing subsidies
17. We would also like to know about non-financial help, this could be information, advice, or general support. How about from your **[read each item below]**, have you received any non-financial support from them? **[If yes]** what kind of help did you receive?
- a. Apprenticeship staff
  - b. Union staff
  - c. Employer
  - d. Other tradespeople or coworkers
  - e. Spouse/partner
  - f. Family or friends outside the trades
18. Was there anything else that helped you during your apprenticeship?
19. Do you have anything else you would like to say about the BOLI Supportive Services Program or working in the trades?
20. Do you have any questions for me about the study?

That is all my questions, thank you so much! And I will send your gift card to you shortly.

### **APPENDIX C: Additional Qualitative Data**

In this section, we provide additional examples to further examine the challenges and support described by interview participants.

#### ***Financial challenges: Access to on the job hours***

One female apprentice successfully completed her program but noted that she faced ongoing challenges with harassment that has impacted her access to on the job hours:

I paid the price for saying “I'm not going to put up with that shit.” I paid a price. I am paying price right now for not allowing one of the foreman on the job I was on to bully me. I'm laid off right now. I could've gone back to work. I could've gotten more work on the site I was on if I hadn't stood up and said, "I'm not going to put up your crap. Don't do that. You don't talk to me like that.” If I hadn't stood up for myself, I would still be working. (white woman, completed)

Another female apprentice recalled how she did not know that she could quit a job that was not giving her adequate hours:

Apprentices are told that they're not supposed to quit jobs, and at the time nobody had explained to me that that didn't include jobs that weren't giving you 40 hours. So I wound up staying with a contractor who was giving very, very few hours for a pretty good long time because they never officially laid me off, and I didn't know that I could quit. (white woman, completed)

### *Financial challenges: Transportation*

One apprentice described how having unreliable vehicle was a challenge during his apprenticeship:

I felt like the way I managed it, I made it a minor problem so that my employer hardly noticed, but I'm lucky and I did some really, I have to say, frankly dangerous things driving the vehicle I was driving. I got lucky and my employer didn't feel the effects of it, but it caused me a huge amount of stress that I would bring home. Like I said, I got lucky. I had to take a lot of risks with a vehicle I didn't really have the resources at the time to maintain it properly. (white man, completed)

Two apprentices reported not having a vehicle during his apprenticeship. One of the two noted the challenges of a lack of consistent work and long hours (although he didn't name the lack of transportation as the primary reason he left the trades). As indicated in his narrative, these are directly related to relying on public transportation:

Well on the jobs that I took, I always let them know that I just want to do for the Metro... I was riding on public transportation at that time. That's the reason why I always wanted to do Portland area... Well, sometimes it was [a problem] when the bus, you know, some issue will happen and, yeah. But it wasn't no major problem. It didn't happen every day. It'll happen once in a while: Bus won't come on time; I will come late to work. Other than that it wasn't no issue. I know exactly what time the bus will come and what time it drops me off and what time at my work. It took me two hours to get me to work. I always wake up early at five o'clock every day to be at work before 7:00. So it wasn't no issue really. (Latino, cancelled)

The combination of maintaining reliable transportation and working out of town posed challenges for Hailey, who completed her apprenticeship. She recalled:

[For one job,] that was a 12-hour day and a long round trip. I was getting up, going to work, coming home, falling asleep. Getting up, going to work, coming home. Nothing in between that. Just back and forth, back and forth. No. That, it was bad. I took myself off of the heavy highway work list after that. Because, there's no way. I'm not doing that. I have an old car too. My car is 20 years old. I can't see myself buying a new car... If you have a vehicle, you can't write anything off. Unless you're a private contractor, you can't write that stuff off. If you have an old car like I do and you're driving the bejesus out of it, you're on your own if you have to replace it. Work is not super steady. I'm not willing to commit to a payment of a brand new vehicle. I put a lot of money into my car right after I got steady work. Because, it goes first to the tools and the car. Then to the groceries and the rent and other things like that. That's how the budget goes. Transportation is a big deal. (Black, cancelled)

### *Non-financial challenges: Harassment and discrimination*

A transgender man reported that the main reason he left his apprenticeship was because of a disability caused by his pregnancy. But he also noted that one of the biggest challenges he faced during his apprenticeship was harassment and discrimination. As he reported: "I'm a trans man. And so I was often seen and treated as a woman. And then in my last couple of jobs I was pregnant and there was a lot of general disgust... they were like 'you shouldn't be here, this is not your place.'" (white man, cancelled).

Several apprentices who completed faced extreme experiences of harassment and discrimination, as in the following examples:

But I saw right in front of me, my immediate supervisor, her boss grabbed her around the neck and shook her like a doll. Like a rag doll right in front of me. Yeah. That still makes my heart beat faster... There's some guys out there that really hate women and it's dangerous. (white woman, completed)

I would say the hardest part [of my apprenticeship] was racism, and still is... my first six months into the program, my foreman... repeatedly called me a [N word], once he found out that I was half black and white. And so I put in a grievance report, and nothing was really done to the man... And then, at another job site, there was a guy who continued to use racial slurs. And then one day, around Christmas I had the word "[N word]" written on my car. (Black man, completed)

### *Non-financial challenges: Lack of mentorship and on the job training*

One apprentice recalled how difficult it was to work without appropriate mentorship:

A lot of the times I was left by myself and I didn't know exactly what to do and that would just result in people being mad. Even though they knew that I was an apprentice and I was trying to learn, it just seemed like I was expected to know everything already. If I did it, that's when the harassment would come in and I would like cursed out or yelled at or

something. When I was in the training [center], they said that they were going to have people with us and always there for help and that wasn't the case. (Latino, cancelled)

Some apprentices were able to complete their apprenticeship with inadequate training, but felt underprepared in their role as journeyworkers, for example:

I would be told, “well you're a journeyman, you should know that.” And it's like, “yeah but it's your responsibility to give me those tools.” And I never got that part. I'm just supposed to learn by watching where everyone else got to learn by actually experiencing things. Because there's eight terms in your apprenticeship and I would be like a seventh or eighth term apprentice cleaning up behind guys that are fourth or fifth term apprentices, which it should have been the other way around. And like even now I'm caulking, when I should be wearing my tools and actually building. So things like that. I've had some hard days. (white woman, completed)

One apprentice felt that she would only be doing clean-up in her trade and wished she had made a different choice:

At this time, I feel like I wish I would've picked a better trade but is more skill than what I have and I feel it would have been more helpful if I would have understood what's in the future but I didn't. And to know that I'll just do clean up instead of being a skilled worker. (white woman, completed)

### *Impact of financial support from the Highway Construction Workforce Development Program: Ready items*

Apprentices described what would have happened if they didn't have the tools they needed:

[If I hadn't received help buying ready items] it would have been to a point where I wouldn't have taken any tools to work and I would have had to kept asking other people to let me borrow some tools and that was already going bad, so once I had my own tools, that was a stress reliever. They were good tools too, so it made it much better. (Latino, cancelled)

[Penny Painter] helped me get my first set of tools, bags, and boots and rain gear, and I wouldn't have had those things has she not been able [to help me]. It'd have been a significant problem. I don't know if I would have been able to make out my first couple of jobs not having no tools, and I obviously I couldn't afford them when I first started... I'd say [this trade] was a great career choice and the BOLI program definitely helped me on that path and put me in a position to be successful. (Black man, completed)

Several apprentices noted how both the financial help as well as the advice they received was helpful:

The main thing I remember, we walked to Home Depot, got some basic tools, but we went to the boot store and she helped me really pick out a good pair of boots, and told me how

important that was for physical, feet and back and neck and everything else (white man, completed)

It kind of helped me understand the value of buying new tools rather than just kind of making it work. Because after I went shopping with Penny and picking everything out, anytime I needed new tools, it wasn't, "Oh, this is a really hard decision." It was, "I'm just going to get tools because I need them for work." And same thing with she bought me a pair of boots and that was really nice too, because before the boots she bought me, I was using some thrift store boots and I was, "Oh, it's fine. It's fine." And she bought me really nice boots and my feet were way more comfortable, my back doesn't hurt as bad and I was, "All right, investing in nice boots is worth it." (white woman, completed)

I basically started the first day of my first job without any tools or anything. And then later that day, when I talked to Penny [Painter], we went to the store and I was able to get boots and stuff. So, it was very necessary considering the situation I was in. (white woman, cancelled)

### *Impact of financial support from the Highway Construction Workforce Development Program: Travel*

One apprentice described how receiving support for travel helped her:

I had one incident where I was working out of town and Penny Painter, she was my, I don't know how to say it, but the one that was working with me through the BOLI program, and she helped me get through to get the per diem and for a room and board when I was working out of town. (multiracial woman, completed)

The limit on support for travel was problematic for some apprentices, for example:

It was very helpful, except it only lasted, I think it's a month or something like that. Which I don't really expect them to pay for all that, but there's not a lot I could do either... [Paying for travel was] a minor problem, because the whole point of the program is to help you pay for things before you get your first paycheck. So, basically if I had no money, then there was no way I could have gone to work. So, with them supplying everything, that really makes it possible for people to get by until they get their first paycheck. (white woman, cancelled).

### *Impact of financial support from the Highway Construction Workforce Development Program: Childcare*

As one apprentice reported: "[If I hadn't received a child care subsidy] I don't think I could have afforded to work. It was extremely helpful" (white woman, cancelled). This apprentice left her apprenticeship because of the long hours away from home, not because of the cost of childcare.

For some, the childcare subsidy alleviated all their problems with childcare, for example: "So another great thing about my time going through the apprenticeship program happened to be when



my two youngest were not in school. They were in childcare [subsidized by the Program]... With the help of BOLI, [childcare] was not much of a struggle at all” (white man, completed).

The challenge of childcare was not only financial; maintaining consistent childcare with changing schedules was a challenge. As one apprentice stated “And affording childcare for the weird hours and the, ‘Oh, now we need childcare next week, [now] we don’t, now we do’ works yourself out of a job” (white man, cancelled). While childcare was not one of the reasons this apprentice left the trades, he described this as a major challenge during his apprenticeship.

### *Impact of financial support from the Highway Construction Workforce Development Program: Hardship funds*

Apprentices reported that receiving hardship funds helped them, for example:

Yeah, I got my truck stolen [and I was] without a vehicle for a few days. Then, I got hold of someone in BOLI, can’t remember who it was, but yeah, that was very, very helpful. They helped me get a car, quick, so I got back to work, quick. [If I hadn’t had that help] that would be a big problem. Because, I wouldn’t be able to go to work. (Latino, completed)

Yes [I received hardship funds], that’s them helping me into a house... [If I hadn’t had that help it would have been a] huge [problem]. Huge. I wouldn’t have been able to afford to get into a place. (white woman, cancelled)

### *Impact of non-financial support from the Highway Construction Workforce Development Program: Pre-apprenticeship*

One interview participant described how Constructing Hope provided both non-financial as well as some financial support:

On top of essentially giving me the knowledge, skills, with each and every different trade that they presented to me, they also provided me the steel toe boots that I didn’t have and a hard hat. On top of that, too, they had a different list of jobs and whatever whatnot that I could take or essentially they give you contacts for different jobs for starting out. That reminds me, I need to give them a call and update what I’m up to... [It would be] probably a big problem [if I hadn’t received that support] because of Constructing Hope and the Bridgework Bootcamp I would not have known where to start with tools and with PPE and what to wear and whatever whatnot, nor would I expect what kind of, how do you say, culture I’d be getting into with the construction world. Both you guys [the Highway Construction Workforce Development Program] and Constructing Hope has helped me. Specifically the culture is the big one. It really helped me learning job site culture. (multiracial man, completed)

Oregon Tradeswomen pre-apprenticeship graduates described how the program helped them be successful:

I would not have made it without them [Oregon Tradeswomen]. I wouldn't have made it as a walk-in at all. (white woman, completed)

[I received] emotional and very valuable support [from Oregon Tradeswomen]. I went to every single social hour I could manage in the first several years of my apprenticeship because I needed their help. I almost quit. Between Oregon Tradeswomen and one of my very favorite people in the carpenters union, I stayed... I didn't quit the union because I was totally emotionally battered every day of my apprenticeship [but] I had allies. I had somebody who could say "try this. Say that." Because all those women, they're of all different, my graduating class was of, They range from forties like me to early twenties. Which was really helpful. Because there's a generation or two there. They have different experiences and different information on how to survive than I do. All kind with different cultural backgrounds. It was really, yeah. It was awesome. It was awesome. (white woman, completed)

Yeah, they were really supportive I tapped into them a lot when I first started, I don't really have communication with them now I guess. But that was a big part of my career when it first took off for sure... I went to their pre-apprenticeship and then they had social meetups. I think they still do it, well obviously not now, but they do social meetup once a month at a local bar or whatever. And so it's any trades woman can come and you have people that have been in the trade for 20 years to a brand new apprentice that hasn't even stepped foot on a job site yet. So that was really cool to go to those, to network with other women. I mean just seeing other women that are doing the same thing as me, it just gave me strength and it reassured me that I can do this. (white woman, completed)

When I was in falling out terms with my apprentice program the first time Women in Trades and Penny all kind of came together and tried to help and support me in any way they could for me to finish my apprenticeship program. And I thought that was very, very nice. (white woman, completed)

### *Impact of non-financial support from the Highway Construction Workforce Development Program: The Penny Painter effect*

Several apprentices offered high praise for Penny Painter:

She was just like a mentor. Anytime I just needed to talk or anything, she was there. She was super amazing. (white woman, cancelled)

She seemed super nice, very helpful. She left it open, so whenever I needed a question or when I needed anything to use, give her a call. (Latino, cancelled)

I was just at a carpenter meeting, probably the last [trade] meeting that we had before this whole thing set down, and Penny was there and she's just so awesome, how much she cares for apprentices and for people and wants to see them successful, she's just so awesome. And I'm just so grateful for her and for the program. (white woman, completed)

Several apprentices noted that Penny Painter’s referrals to other services were very helpful, for example:

Oh, and then they [Program staff] actually directed me to Metropolitan Family Services who helped me tremendously with my credit. It wasn't necessarily a budget class, but this lady we printed out my credit report and we just went over every single thing and like mailed all these letters to these creditors and a lot of things actually got dropped off my credit. I mean, they did a lot of work with me. I think I met every couple of weeks or every three weeks or something for like five or six, probably six different times and it was all free services. It really helped me a lot. (white woman, completed)

The non-financial support Penny Painter provided accompanied the financial support (most commonly ready items), for example:

And one of the things that she helped me with, and one of the things she suggested was me getting good rain gear. So, for when I'm working outside, and I mean once it started raining as it does in Oregon, it was a blessing being able to have that and her giving me a little bit of insight into the things that I would need. (Black man, completed)

Well, besides the actual physical gear in itself, talking to her was very helpful. She's a very competent woman. She's been in the trade for a long time. And speaking with another woman that can give you the insight into working with other people, how to protect your gear, how to take care of it, and just being mindful of the gift that is given because it is a huge thing. Also, she was very informative of reminding us of different other supports that are out there. (Black woman, cancelled)

### *Impact of financial support from other sources: Unemployment*

Several apprentices noted challenges accessing unemployment, for example:

[The biggest challenge in my apprenticeship was] when I wouldn't get paid for the week of training, because I wasn't able to collect unemployment. This is just my case. I wasn't able to collect unemployment because I was working as an independent contractor and I never paid into the unemployment. So I did have a hard time collecting unemployment.” (Latino, cancelled)

I didn't use [unemployment] for about a year because after my first job when I first got laid off like an idiot and also misinformation I filed a claim through Washington and because I had a unemployment claim in Washington I wasn't able to use the unemployment that the PNCCI offered, whatever the hell. I couldn't have two claims is what I was told by the Oregon Unemployment.” (multiracial man, completed)

### *Impact of financial support from other sources: Public assistance*

Participants who used public assistance (particularly housing assistance) had increased challenges when they lacked access to consistent work because public assistance was tied to their (often irregular) income, for example:

I lived in Section 8 Housing during, I think it was most of my apprenticeship. That was a challenge... Yes, [affordable housing] definitely is challenging, especially coming from welfare. Because you come from a situation where maybe you're renting zero or very low, and then you're making changes in your life so you go do an apprenticeship. Well now, your rent is a lot higher because it's based off your income. For example, if you end up on a three-month assignment and now your rent goes up and then you turn around three months later and you're laid off for seven months, it definitely creates challenges there... I got better at learning how to save when I was working... I would actually categorize that as more of a major problem because, like I said, it takes time to learn how to manage your money and whatnot. In construction, you don't know. Sometimes a job is a year long, two years long. Sometimes it's 30 days. (Black woman, cancelled)

#### *Impact of non-financial support from other sources: Partner*

Apprentices described how their partners provided an important source of support during their apprenticeships, for example:

I wouldn't be here today without [support from my partner]. She's my rock, you know? She's what keeps me going even when I don't think I have any more to go with. So, yeah, no, there, Kind of a loss of words there. She's my better half by for sure. You know, always been supportive. She was actually the one that told me to move forward with the apprenticeship program. I said, "Well, this could be scary. We don't know where it's going to go. I can't leave you, so if they want to shoot me out of town, this is all waste." She was like, "Well, you've got to take risks in life." And that's kind of her motto on everything. And without her, I don't know. Crazy. She's one of a kind. (white man, completed)

My spouse was always super supportive of me where she used to drive me to work all the time when I couldn't pay for parking she would drive me to and from work so that I wouldn't have to pay for parking. And then she, yeah. She was always there, helped me get up early, helped me wash my clothes, make lunches and stuff like that. (white woman, completed)

#### *Impact of non-financial support from other sources: Tradespeople*

Apprentices described tradespeople who served as mentors as key sources of support, for example:

My boss was an excellent mentor and he taught me a lot, a lot, a lot." (white woman, completed)

I've definitely had some awesome mentors along my path for emotional support and even kind of like that bullying situation, I've had coworkers stick up for me, have my back when people are trying to harass me or whatever, talk crap behind my back. So that's been nice...

There was one coworker, another girl, who we just got treated the same. We just kind of got drug through the dirt and there's times where I'd just be like, "you know what, forget it. This isn't for me. I'm not going to deal with this." But I would look over at her and she'd just be nose to the ground, just go to town, and that's what got me through. And just seeing her determination, seeing her do it, it gave me the motivation to stay in and say, "you know what, I can do this." (white woman, completed)

Several apprentices noted support that included non-financial support and indirect financial support (e.g. rides to work, changing the oil on a car), for example:

I've gotten a ride to work before [from my foreman and a couple journeymen]. Let's see, [I've also gotten] just advice about how to deal with some of the family issues that come up in our line of work. (white man, completed)

I mean, all the guys I worked as always helped me a lot. I mean at work they helped me learn lots of stuff and they always were giving me advice when I was at work or helping me, say some of them came over and helped me change my oil one time and helped me figure out how to fix things around my house. Lots of stuff. (white woman, completed)

#### *Impact of non-financial support from other sources: Union and apprenticeship staff*

Apprentices described the various ways that union and apprenticeship staff provided non-financial support, for example:

Just the knowledge from the instructors in general was beneficial because you get to learn the subject, and not only that, but the instructors of the apprenticeship were really helpful about informing you about what was out there, and encouraging, not only that, but to keep your head up during tough times. And they were more like friends with motivational quotes for you than instructors just trying to teach a subject. (Latino, cancelled)

Yeah, there were a couple of times that they made sure to let us know about the BOLI program, which was a big help because then I was able to take that information for the hardship that I had to do." (white man, completed)

[Name] through the apprenticeship, she was very motivated to keep us motivated in our apprenticeship and hearing her story of her challenges through life, and showing us that it's possible. (multiracial woman, completed)

[An apprenticeship staff member] helped me with that whole deal where that guy had been harassing me and stuff. And so she helped me kind of get that dealt with and got him, it was way down the line he got I think in trouble for it and got some sanctions put on him." (white woman, completed)

Several apprentices noted that unions staff visited their job sites, for example:

Yeah, they would go in a job site, and talk to the apprentices, talk to journeyman, ask if everything was fine, if they needed anything to change at the job site. They would ask if we would be having problems with companies. They were helpful, as well.” (Latino, completed)

Yeah, my union rep was great. He was really very present. He was on site a lot and he actually got me a different job when I decided to leave the first company that I was at. I'd been there for a long time, but then after that guy had been shitty with me and I realized it wasn't really going anywhere that helped me figure out how to get employment somewhere else.” (white female, completed)

A minority of apprentices felt they receive little or no support from apprenticeship and union staff, for example, “I got some job recommendations here and there, but it wasn't always super helpful” (white woman, completed).

### *Impact of non-financial support from other sources: Employers*

Apprentices reported on how individual staff members and contractor policies provided support, for example:

I was pretty close with some of my employer people from the company I was working at. They were pretty motivated and kept noticing your work ethic and stuff. So they would definitely inform you on your work ethic. And that was really nice for them because it makes think you're doing something right, or they just encourage you to keep moving up, especially when they start giving you raises and stuff because they see the amount of work that you're doing. I mean, that's helpful in every aspect. You get more of a raise, you're able to pay more things, and be less stressed about certain stuff. (Latino, cancelled)

Well, I had worked at a couple of other companies and they just weren't seeming like they wanted to give the women a chance and would prefer having men. Well, being a female apprentice, you kind of get pushed off to the side while you see the male apprentices getting a hand up from everybody else. It was very frustrating to see that. So that's why when I went to [my current company], I was very fortunate for being with that company because they didn't do that. (multiracial, completed)

Some apprentices reported that employers appropriately dealt with harassment when it occurred, for example:

Yeah, basically, a guy literally just came and, he had made advances at me before, and I'd made it clear that I wasn't interested, and he made advances again. Third time he literally grabbed me and, at first, I didn't say anything. It just really shocked me and caught me off guard. And then it took me a couple of days, I told a friend, and then I did end up telling my boss and my boss immediately released the guy. But yeah, so it expanded over a week period to where it was going on. And I felt uncomfortable. I felt uncomfortable even when he got fired. (Black woman, cancelled)

Other apprentices reported that incidents of harassment were not appropriately dealt with, for example:

He made me work with him and then he saw my wedding ring and was, “Oh. You're married?” And I was, "It's not really any of your business. But just we can keep talking about work stuff. I need this [material].” or whatever. He was, “Oh, well when did you get married?” And I was, “It's a while back. I don't want to talk about it with you. It's not your business. Let's move on.” And then he was, “Oh, well I could be your sperm donor.” And then when I complained about it to my boss, my boss didn't take him off the job, didn't give him any time off. My boss acted like he was taking it seriously. He was, “Oh, that's really bad. I can't believe he would say that to you. Blah, blah, blah.” Whatever. But then this guy ultimately didn't even really get in any kind of trouble for it. Oh, and he's the same guy who's been running around and kept telling all of his guys, “Oh, just throw your trash on the ground. The girls will clean it up.” Because there was another female apprentice on the job. And of course the two of us were on cleanup duty even though she was way further in her apprenticeship than I was, and I was, Whatever. (white woman, completed)

## **APPENDIX D. Additional Quantitative Data**

### *Veterans in Construction Apprenticeships*

In the 2018-19 cohorts, veteran apprentices comprised 6% of all apprentices, down from a high of 12% in 2012-13 (Figure 21). Veterans are more likely to be white men than non-veterans, although this is decreasing over time: of all veteran apprentices in 2005-19 cohorts, 79% were white (compared to 59% of non-veterans), 72% of apprentices active in 2018-19 were white (compared to 51% of non-veterans) (Figure 22). Veterans are equally represented across trades, although they might be slightly over-represented among union iron workers (Figure 23). Since 2011-12 and 2018-19, percentage of veterans has increased by 133% among non-union carpenters while decreasing among union laborers, cement masons, and in the non-highway trades (Figure 24). In 2010-11, veterans comprised 7.5% of all apprentices in the highway trades who completed. In 2018-19, this percentage was up to 8.5% (Figure 25). Veterans in the highway trades receive services at similar rates as non-veterans. Veterans have lower completion rates than non-veterans: while 39% of non-veteran apprentices in the 2008-19 cohorts completed (rather than cancelled), 34% of veteran apprentices completed (Figure 26), and the effect of services on completion is larger among non-veterans (0.14) than it is for veterans (0.09)

Figure 21. New Apprentices in Highway Trades in Oregon by Veteran Status, 2005-2019 (OAS Data)

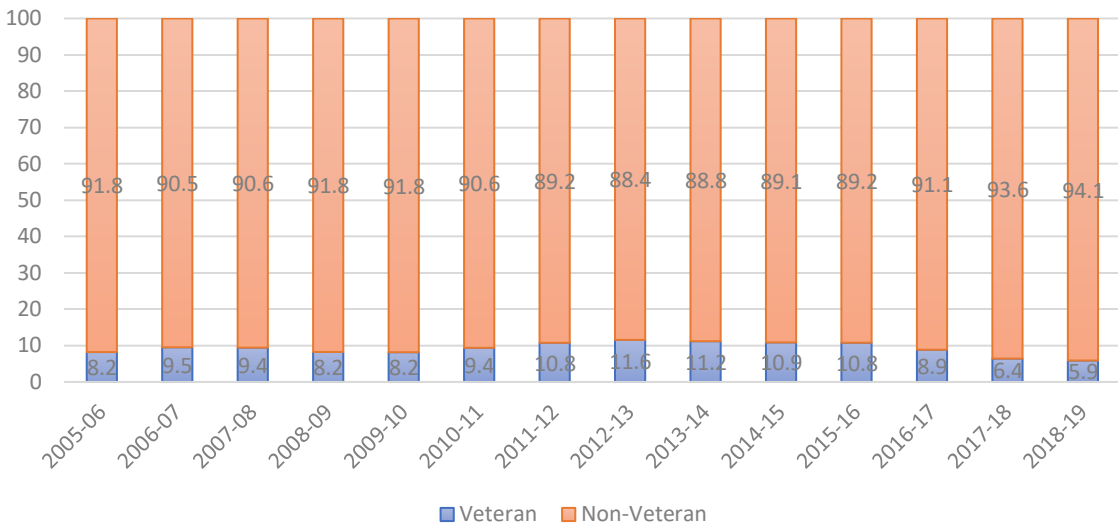


Figure 22. New Apprentices in Highway Trades in Oregon by Veteran Status and Race/Ethnicity and Gender, Active in 18-19 and 2005-19 Cohorts

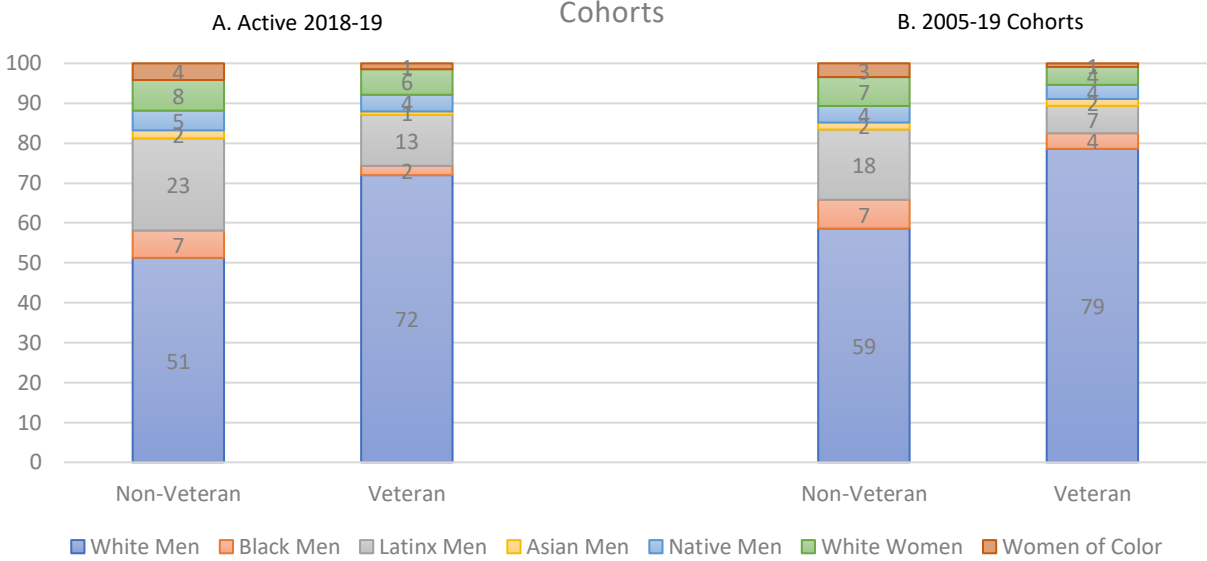




Figure 23. New Apprentices in Highway Trades by Veteran Status and Trade (%), Active in 18-19 and 2005-2019 Cohorts (OAS Data)

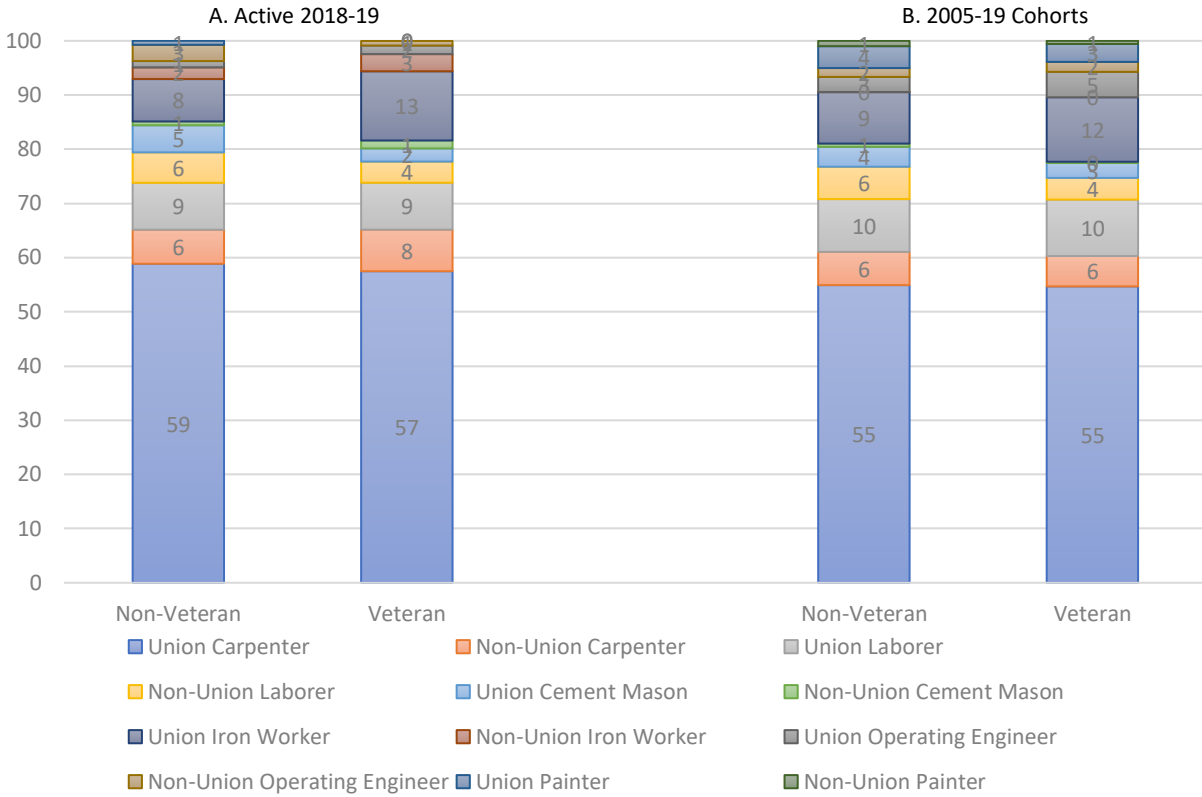


Figure 24. Percent Change in Veterans in Construction Trades, 2011-12 to 2018-19 (OAS Data)

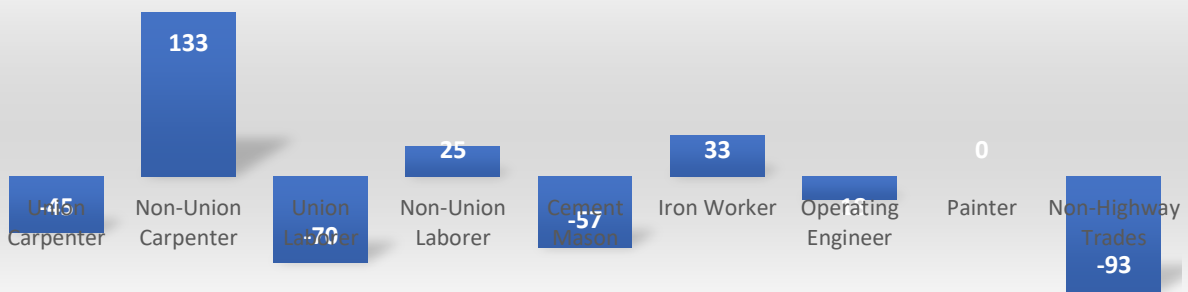
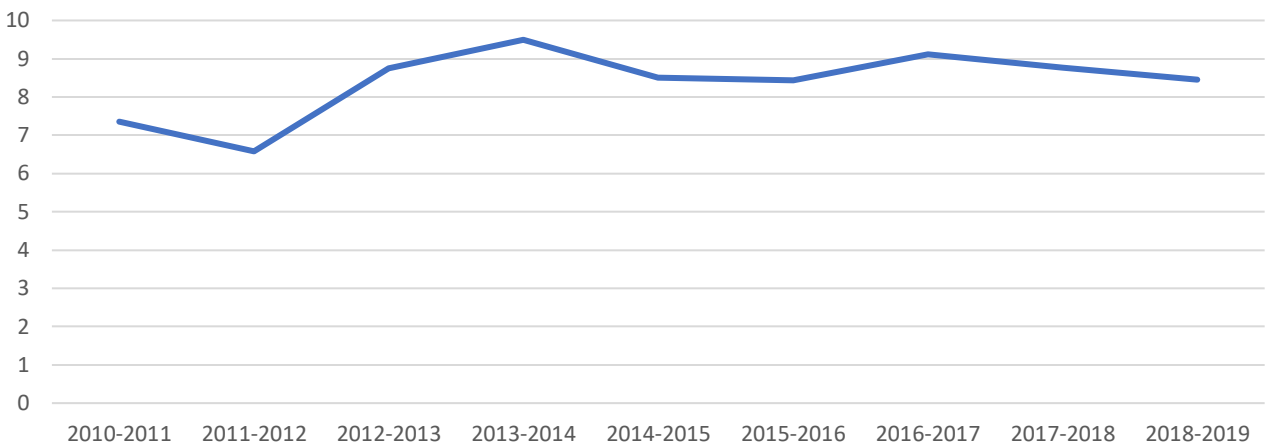


Figure 25. Percent of Highway Trades Apprentices Completing Who are Veterans



### APPENDIX E. Highway Workforce Development Program

Below are the contracts associated with the Highway Workforce Development Program for the 2017-2019 biennium:

Program evaluation: Portland State University

Trade specific pre-apprenticeship: Akana (Cooper Zietz Engineers) with subcontractors Blue Sun, Inc., Pacific Northwest Carpenter Institute, Cement Masons Local 555, Oregon Tradeswomen and Constructing Hope

Industry focused pre-apprenticeship services: Portland Youthbuilders, Oregon Tradeswomen with subcontractor Constructing Hope

Pre-apprenticeship distance learning modules: Oregon State University (Professional and Continuing Education) with subcontractor Oregon Tradeswomen

Supportive services for apprentices: Akana (Cooper Zietz Engineers, Inc.) with subcontractors Labor's Community Services Agency and the Oregon Southern Idaho Laborers-Employers Training Trust

Apprentice Related Child Care (ARCC) program for apprentices in Highway Construction Trades: Department of Human Services Office of Self-Sufficiency

Respectful workplaces: Oregon Tradeswomen with subcontractors Constructing Hope, Green Dot, and Portland State University

Web-Based Training Module for Nutrition: University of Iowa