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Continuing to Build a More Diverse Workforce in the Highway Trades: 2018 Evaluation of the ODOT/BOLI Highway Construction Workforce Development Program

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Continuing to Build a More Diverse Workforce in the Highway Trades: 2018 Evaluation of the ODOT/BOLI Highway Construction Workforce Development Program

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TABLE OF CONTENTS

Continuing to Build More Diverse Workforce in the Highway Trades: 2018 Evaluation of the ODOT/BOLI Highway Construction Workforce Development Program

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EXECUTIVE SUMMARY

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; and work clothes, tools, and protective equipment) and supportive services providing non-financial assistance (i.e., counseling, formal mentoring, social support). This report provides findings based on data from the Oregon Apprenticeship System (OAS) and a phone survey, conducted in March of 2018, of current and recently active apprentices. Overall, the current study provides findings regarding the effectiveness of the Highway Construction Workforce Development Program at improving recruitment and retention of a diverse 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. As shown in Figure 1, in 2017 the percentage of new apprentices who were white men dropped to 69% (OAS data). As a result of increased recruitment, women and people of color comprise a growing proportion of those completing apprenticeships (Figure 2)*

Figure 1. New Apprentices in Oregon Heavy Highway Construction Trades by Race and Gender, 2005-2017 Cohorts (OAS Data)

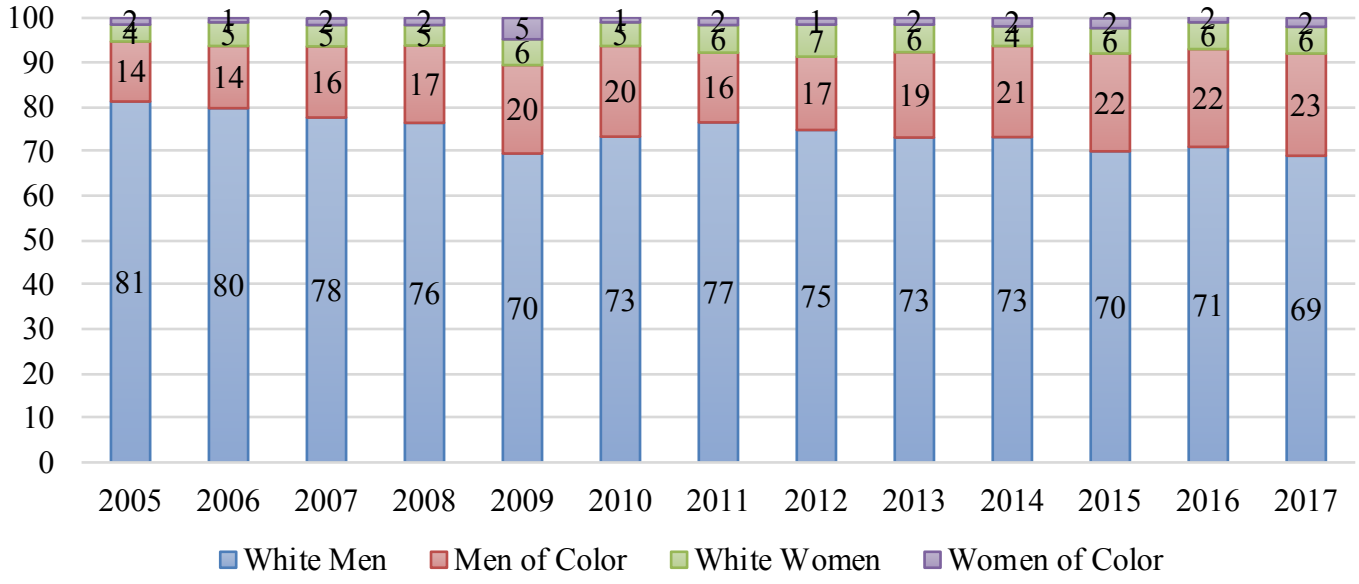
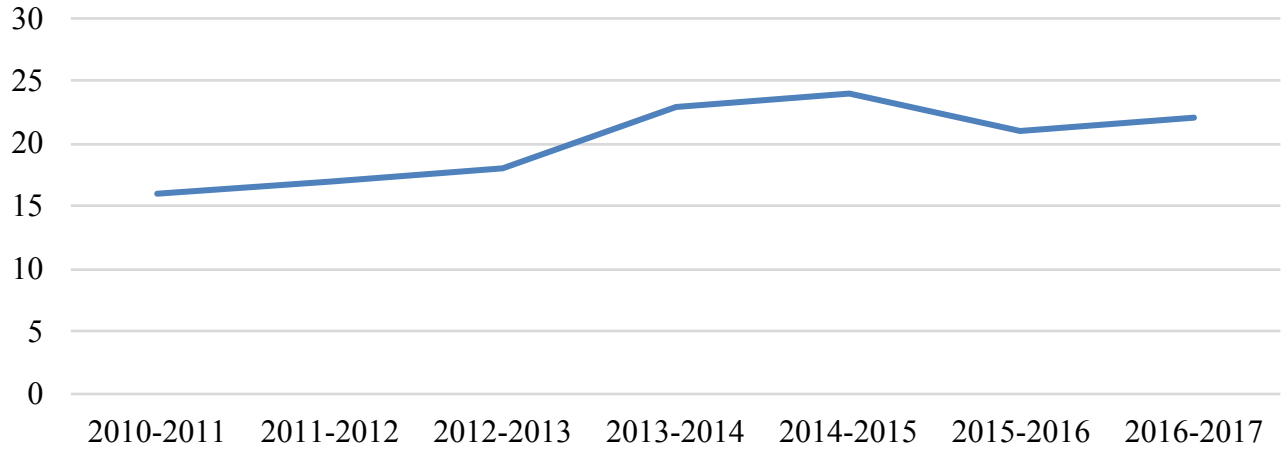
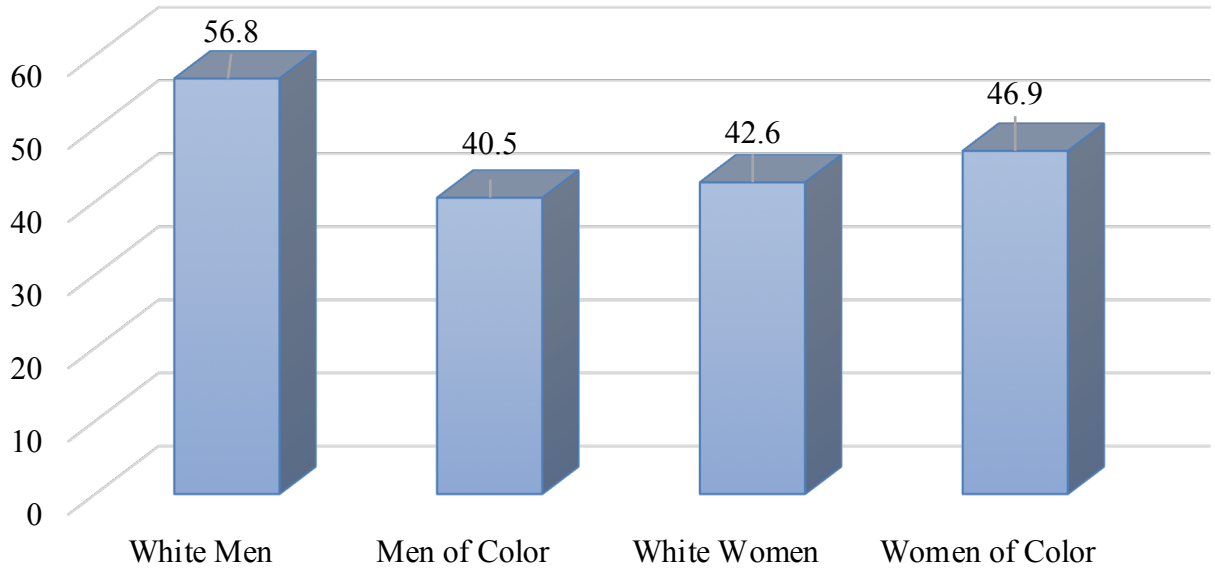


Figure 2. Percentage Completing Who are Women or People of Color, by Year (OAS Data)



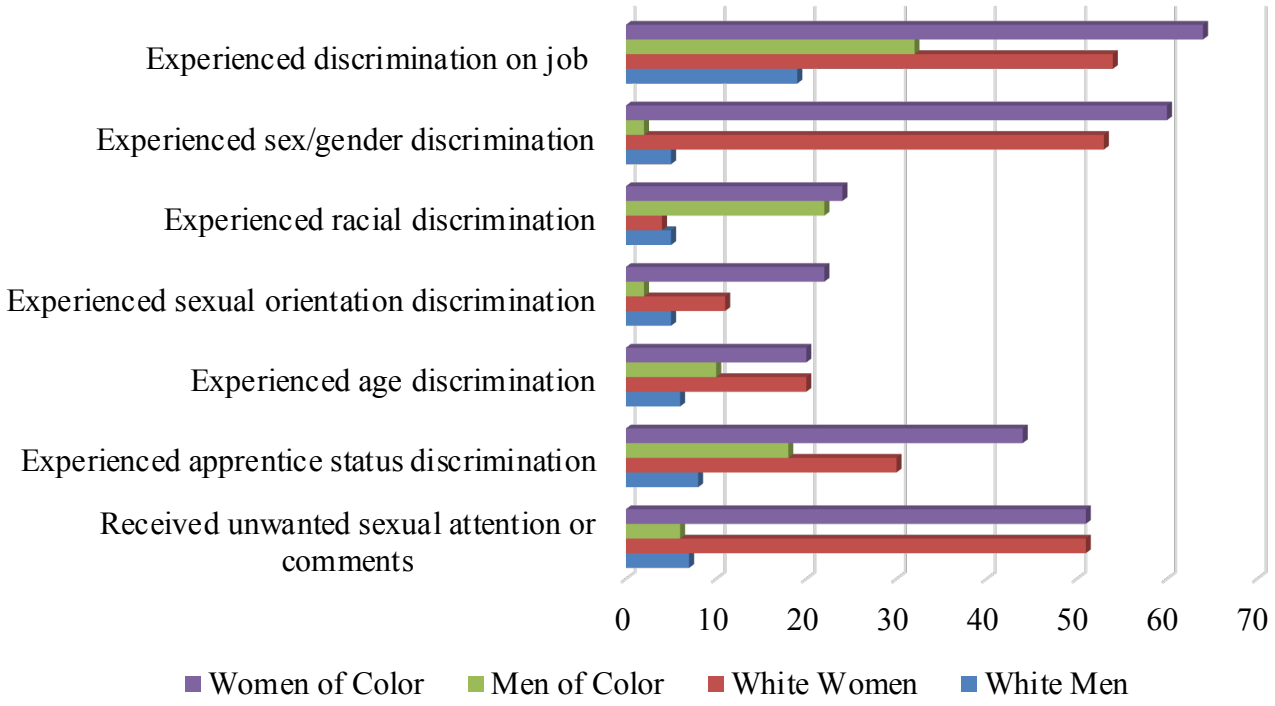
Finding 2: *Female and racial/ethnic minority apprentices have lower completion rates than white men, yet progress continues to be made. Among apprentices active in 2016-17, women and men of color were less likely than white men to complete rather than terminate their apprenticeships by the end of 2017 (Figure 3).*

Figure 3. Completion Rates of Recently Active (2016-17) Apprentices, by Race and Gender (OAS Data)



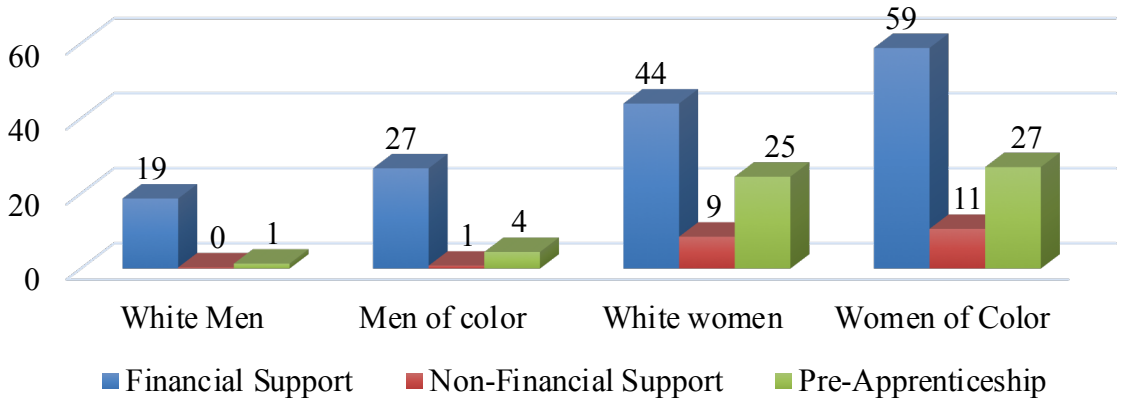
Finding 3: *Hostile workplaces continue to be an issue in the trades. Figure 4 indicates that all race-gender groups experience discrimination on the job site, with women and people of color reporting high rates of discrimination due to their gender and/or race/ethnicity. Rates of reporting discrimination on the job site due to race/ethnicity and gender, however, have declined slightly since 2016.*

Figure 4. Percentage of Apprentices Experiencing Discriminaton or Harrassment, by Race and Gender (2018 Survey Data)



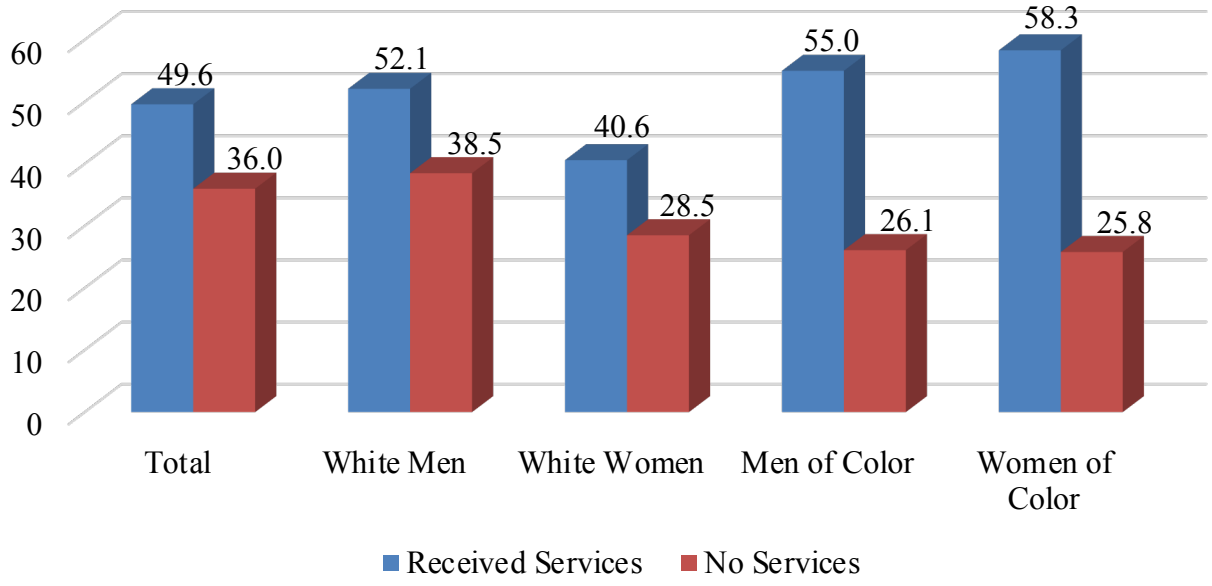
Finding 4: *The Highway Construction Workforce Development Program reaches a diverse group of apprentices. While race/ethnicity and gender are not criteria for receiving services, the program has been successful in reaching disadvantaged apprentices, as shown in Figure 5. The percentage of women and people of color receiving financial supportive services increased between 2016 and 2018, and the percentage of women receiving non-financial supportive services also increased between 2016 and 2018.*

Figure 5. Percentage of Apprentices in Eligible Trades Active in 2016-17 Served by ODOT-BOLI Services, by Race and Gender (OAS Data)



Finding 5: *The Highway Construction Workforce Development Program continues to improve completion rates for apprentices in eligible trades who receive services. As shown in Figure 6, apprentices in eligible trades who received ODOT-BOLI supportive services were more likely to complete an apprenticeship than those who did not receive services.*

Figure 6. Completion Rates among Apprentices in Eligible Trades by Recepit of ODOT-BOLI Services, by Race and Gender
(OAS Data, 2005-2017 Cohorts)



The report concludes with an update on the 2016 recommendations for creating a more diverse workforce in the highway trades. These recommendations include:

- Continue efforts to recruit diverse workers into apprenticeships
- Strengthen and expand pre-apprenticeship programs and retention services throughout the state
- Improve engagement with the broader community and with youth
- Promote respectful workplaces
- Ensure equal opportunities for employment during apprenticeship
- Improve quality of on-the-job training during apprenticeship
- Continue financial supportive services; expand non-financial supportive services
- Continue efforts to promote awareness of ODOT-BOLI supportive services

INTRODUCTION

While white men have historically dominated the highway construction trades in Oregon, this trend continues to change: of those enrolled in apprenticeships in the highway construction trades in 2005, 81% were white men; in 2017, this number was 69%. Of apprentices who completed an apprenticeship in 2010, 84% where white men; in 2017, this number was 76%. These changes are likely due, in part, to efforts by the Oregon Department of Transportation (ODOT) and the Bureau of Labor Industries (BOLI) to diversify the skilled highway construction workforce through pre-apprenticeships as well as financial and non-financial services to apprentices in eligible trades through the Highway Construction Workforce Development Program.

This report assesses the continued efforts of these supports using data from the Oregon Apprenticeship System (OAS) and a phone survey of recently active highway trades apprentices conducted in March of 2018. In addition, we compare these findings to those previously reported in 2014 and 2016. This year's survey included additional information on apprentices' individual and household income and childcare needs, before, during, and after apprenticeships. Specifically, this report aims to explore the following questions: 1) Has the recruitment and retention of women and people of color in highway trades apprenticeships continued to increase since a) the inception of the program in 2010? and b) the previous reporting period of 2014-2015? 2) Has the awareness, use, and evaluation of supportive services changed since the previous reporting period? and 3) What is the impact of supportive services on retention and diversity in the highway trades? The report concludes with a set of recommendations for improvements to the Highway Construction Workforce Development Program and an update to the Performance Measurement System proposed in the 2016 report.

Research has documented the variety of issues that women and racial/ethnic minorities have faced in entering the construction workforce (e.g., Burd-Sharps et al. 2014; Haines et al. 2018; Hegewisch and O'Farrell 2015; Kelly et al. 2015). The perception that construction work remains a job for white men, the lack of exposure of construction related skills, and the lack of networks with current construction workers inhibits some women and people of color from entering the occupation. Once on the job, many female and racial/ethnic minority construction workers experience a hostile work environment characterized by racist and sexist jokes and comments, sexual harassment, as well as racial/ethnic, gender, and heterosexist discrimination. This lack of acceptance on the job site can result in the inability to access personal relationships and networks that are necessary for continuous employment and mentoring relationships. Thus, female and racial/ethnic minority workers often experience more time out of work and lower quality on-the-job training. Many of the policies and practices of construction organizations are, on the surface, gender and race/ethnicity neutral, making it difficult to identify and report when gender and racial/ethnic discrimination has occurred. Many workers resist reporting even blatant sexism and racism on the job site, for fear that they will be retaliated against or lose their job. These issues with both recruitment and retention of women and people of color in the trades has resulted in the lower percentage of women and people of color in construction, compared to their representation in the broader workforce.

Despite the challenges described above, jobs in construction are potentially desirable for many workers, given the minimum educational requirements, ability to earn money while training as an apprentice, opportunities for advancement, and solid wages and benefits. Advocates for diversity in the construction workforce argue that these opportunities should not be denied to female and racial/ethnic minority workers. Researchers predict a shortage of workers in the construction trades as older workers retire

(Haines et al 2018, Moir et al. 2011); this suggests a strong pipeline of workers is needed. Programs designed to improve recruitment and retention of a diverse construction workforce have been implemented in states such as Oregon, Maryland, Illinois, and Minnesota as well as in cities such as Boston, New Haven, New York, Portland, San Francisco, and Los Angeles (Hegewisch et al. 2014; Haines et al. 2018; Hegewisch and O'Farrell 2014; Hegewisch and O'Farrell 2015; Moir et al. 2011). These efforts include goals for diversity among workers in construction project contracts as well as support for programs to improve recruitment and retention, such as pre-apprenticeships and ongoing mentoring. The specific programs included in this evaluation are described in the following section on the Highway Construction Workforce Development Program.

THE HIGHWAY CONSTRUCTION WORKFORCE DEVELOPMENT PROGRAM

The goal of the Highway Construction Workforce Development Program is to improve stability and diversity of the highway construction workforce by promoting recruitment and retention of apprentices. The elements of the program included in the PSU evaluation are pre-apprenticeship programs (to improve recruitment and retention of apprentices) and financial and non-financial supportive services (to improve retention of apprentices).

Pre-apprenticeship Programs

ODOT/BOLI has sought to build a more diverse pipeline of applicants for apprenticeships in the highway construction trades by supporting pre-apprenticeship programs. These programs are designed to help individuals develop qualifications and skills necessary to learn a trade, particularly through an apprenticeship program. Pre-apprenticeships can help to reach not only women and people of color, but also people without family or friends in the trades, a common conduit for employment in this sector. Pre-apprenticeship programs also offer ongoing mentoring and support for their graduates, through apprenticeship and beyond. The pre-apprenticeship programs currently receiving funding through the highway construction workforce development program are Oregon Tradeswomen, Inc., Constructing Hope, Blue Sun, and several trade specific pre-apprenticeship classes provide through carpenter and cement mason unions.

Supportive Services

Supportive services provide financial and non-financial assistance to apprentices in order to allow them to accept (and complete) more jobs and improve overall retention in apprenticeship programs. Currently, the highway construction workforce development program funds the following services:

- Fuel assistance for travel to and from job sites and required classes
- Lodging and per diem for jobs that are more than 60 miles from home
- Job readiness supplies (work tools, work clothing, personal protective equipment)
- Child care subsidies
- Non-financial support services (counseling, formal mentoring, social support)

Supportive services are available to current apprentices in registered apprenticeships who are:

- Working in eligible trades: carpenters (and allied trades), cement masons, ironworkers, laborers, operating engineers (and allied trades), and painters
- Working on a highway and/or bridge job (any trade)
- Some additional criteria apply for specific services

For the 2016-2017 biennium, the overall budget for the Workforce Development project was just over two million dollars (including program administration costs). In 2016, direct assistance provided to apprentices totaled $213,930.63; in 2017, direct assistance totaled $221,426.35.

Utilization of the Highway Construction Workforce Development Program Services

Between 2014 and 2018, awareness and use of the Highway Construction Workforce Development Program continued to increase. In the 2014 survey, 33.6% of apprentices in eligible trades (or working on a highway/bridge project) not currently being served were aware of the program; in the 2016 survey, 46.4% of these apprentices were aware of the program; in 2018, this number had increased to 55.2% (Appendix D).

Financial support. There has been a continued increase in the percentage of apprentices in eligible trades receiving financial support services. Among apprentices active in eligible trades in the previous reporting period (2014-15), 21.4% received ODOT-BOLI financial support services; among apprentices active in eligible trades in the most recent reporting period (2016-17), 24.6% received ODOT-BOLI financial support services (Table 1). This increase is evident across all gender and racial/ethnic groups, except white men. While women and people of color are not specifically targeted for financial support services, women, particularly women of color, are receiving financial support services at higher rates than white men. In 2016-17, 58% of eligible women of color received some type of financial supportive service, compared to 22% of eligible men. Since the last reporting period, the percentage of apprentices receiving financial support services increased at a greater rate among women, particularly among white women, than among men.

Table 1. Percentage of Eligible Apprentices Receiving BOLI-ODOT Financial Support Services

	2011-2014 Reporting Period						
	Total	Men	Women	White Men	Men of Color	White Women	Women of Color
% Receiving Financial Support Services (among apprentices in eligible trades)	14.5	13.3	24.5	12.5	15.3	20.8	34.5
	2014-2015 Reporting Period						
	Total	Men	Women	White Men	Men of Color	White Women	Women of Color
	21.4	19.9	34.9	19.3	21.0	26.9	52.2
	2016-2017 Reporting Period						
	Total	Men	Women	White Men	Men of Color	White Women	Women of Color
	24.6	21.8	46.4	18.8	26.9	41.5	58.0

Source: Authors' analysis of OAS data; Burd-Sharps, Lewis, & Kelly 2014

Similar to the previous reporting periods, in the 2016-17 reporting period there was variation in the type of financial support received. Among apprentices active in 2016-17 who received financial support, 90.2% received support to purchase tools and protective equipment, 26.6% received fuel assistance, 15.7% received lodging/per diem assistance, and 9.5% received child care support (Table 2). Financial assistance to pay for required tools and equipment continues to be the most common financial support provided to eligible apprentices.

Table 2. Percentage of Eligible Apprentices Receiving BOLI-ODOT Financial Support Services by Type of Service

	Childcare	Lodging/Per Diem	Fuel	Tools/PPE
% Receiving Each Type of Financial Support Service (among apprentices receiving any financial supports)	**2011-2014 Reporting Period**			
	11.8	37.3	52.7	69.2
	2014-2015 Reporting Period			
	11.6	29.9	42.2	82.9
	2016-2017 Reporting Period			
	9.5	15.7	26.6	90.2

Source: Authors' analysis of OAS data; Burd-Sharps, Lewis, & Kelly 2014

There continues to be variation in type of financial support service received by race-gender groups (see Appendix B). A greater percentage of women (10.4%) than men (9.3%) receiving financial support services received support for childcare, yet this gender difference is smaller than that reported in the previous reporting period. Women of color receiving financial services are the most likely of all race-ethnic groups to utilize the child care support service. The overall percentage of financial support recipients receiving child care support has declined, with only 9.5% of apprentices receiving financial support services receiving child care support. Because OAS data does not include information on household composition, we are unable to determine the percentage of all eligible *parents* who are utilizing child care support services.

Among 2018 survey respondents (see Appendix J), 4.8% of parents received child care support services, with 8% of white fathers, 7% of minority fathers, 1.5% of white mothers, and 0% of minority mothers surveyed receiving child care support (race-gender differences not reported in App J). Parents surveyed with children five or younger were not more likely to report receiving child care support than those with children older than five, yet parents surveyed living with a partner/spouse were more likely to receive child care support: while 2.1% of single parents reported receiving child care support, 5.6% of partnered parents reported receiving child care support. Survey respondents receiving child care support used a variety of child care arrangements: 20% relied on a spouse/partner; 10% used an unpaid friend or family member; 60% used a paid child care provider, and 10% reported having children old enough to take care of themselves. These patterns, however, are likely shaped by the over-representation of male survey respondents receiving child care support.

Mothers, regardless of child care support status, 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 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.

In the 2016-17 reporting period, the majority (90%) of those receiving financial support services received support to pay for tools and other job readiness items (Appendix B). Women were slightly more likely than men to utilize this support. Also similar to previous reporting periods, a greater percentage of men (29%) than women (17%) receiving financial supportive services received fuel support, and a greater percentage of men (18%) compared to women (9%) received per diem support. The gender difference in fuel support and per diem receipt mirrors that found in the previous reporting period. It may be that male apprentices travel out of town more frequently for work than do female apprentices and may require more support for per diem and fuel. In fact, in our 2016 survey of apprentices, we found that men were more likely than women to report traveling out of town for jobs (79% vs. 61%), and this gender difference was larger among apprentices of color (79% vs. 46%) than among white apprentices (79% vs. 66%).

Non-financial support. A smaller percentage of apprentices received non-financial supportive services than received financial supportive services. In the 2016-17 reporting period, only 1.4% of apprentices in eligible trades received non-financial support services (i.e., counseling, mentoring, social support), down from 2% in the 2014-15 reporting period. A much larger percentage of women (9%) than men (0.5%) received non-financial supportive services (Appendix B), a gender difference that has increased since the 2014-15 reporting period. While overall rates of receiving non-financial supportive services decreased since the 2014-15 reporting period, rates among women have increased.

Pre-apprenticeship. In 2016 and 2017, 286 individuals completed a pre-apprenticeship through Oregon Tradeswomen, Inc. and Constructing Hope. This included 40 white men, 74 men of color, 122 white women, and 50 women of color.

For apprentices active in 2016-2017, 5% of those in eligible trades completed a pre-apprenticeship, and women and people of color are still more likely to enter the trades via a pre-apprenticeship: 25% of white women, 24% of women of color, and 4.5% of men of color in eligible trades completed a pre-apprenticeship (Appendix B). However, this is a decline from the 2014-15 reporting period; for example, in the previous reporting period, 35% of women of color in eligible trades had completed a pre-apprenticeship. Yet pre-apprenticeship programs continue to increase the overall number of women (and, to a lesser degree, men of color) in heavy highway construction apprenticeships by recruiting more diverse workers into apprenticeships in the trades.

Participants' Assessment of Services

Similar to 2014 and 2016 survey responses, in 2018 many apprentices receiving services felt that services enabled them to take jobs they otherwise would not have taken (Appendix D). Of all apprentices receiving ODOT-BOLI services, 67% said the services allowed them to take jobs they otherwise would not have, with women of color most likely to report this (86%). A greater percentage of women (12.4%) than men (10%) agreed they would not have completed their apprenticeship without support services, and among men, men of color were more likely to report this. Across different types of support services, those receiving per diem (travel) support were most likely to report services allowed them to take jobs they otherwise would not have (78%; see Appendix K). This is compared to 74% of those receiving fuel

support, 67% of those receiving tools/PPE support, and 55% of those receiving child care support. Apprentices receiving tools/PPE support were the most likely (29%) to agree they would not be able to complete their apprenticeship without support services; those receiving child care were the least likely (17%) to report they would not be able to complete their apprenticeship without support services.

Among apprentices receiving multiple support services, apprentices were most likely (45%) to report support to purchase tools and PPE was most helpful (Appendix D). This finding was consistent across all race-gender groups except among men of color, who reported child care support as most helpful. This is a significant finding given support to purchase tools is the most common support received and is the support with the lowest cost per person, suggesting that providing assistance for job readiness is a highly cost effective support to continue to provide.

Additional information about comparing the effectiveness of various forms of financial support comes from comments in open-ended questions. Many participants noted how one specific type of financial assistance helped ease the other work-related expenses or the overall household budget. In other words, receiving assistance for one type of expense allowed participants to reallocate funds to other equally important areas. As several participants noted:

> [Fuel assistance] was a huge plus. I worked out of town. I am older and have kids. Getting money for gas kept more money at home for the kids. (white man)
>
> [Receiving child care subsidies] helped out tremendously. Without it, I would not have been able to afford my mortgage. (Latino)
>
> [Receiving child care subsidies] helped immensely. It took a lot of the stress off of spending every penny I had on childcare. I was able to pay for boots, clothes, equipment. I was able to better provide for my children. (white woman)

Thus, discussions about the relative effectiveness of different elements of the supportive services program must take into account that apprentices' expenses are interrelated.

Tools, clothing, and personal protective equipment (PPE). As noted above, this service was the most widely utilized by apprentices. Also, participants receiving multiple services noted that receiving tools, clothing, and PPE was the *most* helpful. In open ended comments, participants reported that having this support was critical in order to have the necessary items to start their first job. Others noted that having all the appropriate items allowed them to access more advanced training than those who arrived on the job site unprepared. The following are some representative comments:

> It allowed me to start my apprenticeship. (Asian woman)
>
> It got me in. If I hadn't had that I don't know what I would have done. I did not have the money to buy gear and equipment. (white woman)
>
> It made my job, I was able to learn other things that other apprentices didn't have the chance to. I was more prepared and more liked because of it. I was more efficient. It made work easier. (white man)

> It helped because I was just starting out with my career and it is expensive to start out. I didn't have any of the necessary tools. It made me feel more confident to show up for work with the proper tools. I just felt supported, which is important when you are a woman in the trades. (white woman)

Fuel assistance. Apprentices regularly have to drive significant distances for work and apprenticeship classes; as noted above, 27% of apprentices receiving financial services received fuel assistance, with 7% of apprentices in eligible trades receiving fuel assistance (Appendix B). In open ended responses, participants noted that this assistance helped "a lot," "immensely," "tremendously." A small number of participants noted that they would not have been able to get to work without this support. Some representative responses are below:

> It helped greatly. I had to drive over 75 miles one way to a job and was able to get reimbursed for my gas. It definitely helped. Having to spend that money on gas really hurt. (white man)

> I would not have made it otherwise. (white woman)

Overnight travel. Participants noted that support for overnight travel (hotel costs and per diem) was particularly helpful when they were expected to travel at the beginning of the apprenticeship or other points in their apprenticeship when they had limited savings. Participants noted that receiving this benefit allowed them to avoid either driving back and forth to out of town jobs or turning down these jobs. Below are some representative responses:

> It was my first dispatch and I didn't have any money, and the distance was far from home. (white man)

> It made my first week out of town manageable. I didn't have the stress of having to drive back and forth. (white woman)

> It helped me to become adjusted to being away from my home and family, eased the financial burden, and helped me to be gainfully employed. (African American man)

Child care subsidies. This component of the program serves a smaller number of apprentices but allows the highest cap on assistance for each apprentice. Among apprentices receiving child care support, the majority reported that this support allowed them to work additional hours. In open ended comments, participants reported this support was very useful (only one participant noted that it was not helpful because it did not fully cover the costs of child care). Some representative responses include:

> Receiving this subsidy helped pay for childcare. Otherwise I wouldn't be able to afford to. (Latino)

> This was great! I was out of town and my wife works so basically having a babysitter or after school care was definitely needed. (white man)

Non-financial support. Non-financial support provided through the Workforce Development program comes from a variety of sources: ongoing support from Oregon Tradeswomen and Constructing Hope pre-apprenticeship programs, a budget class through Akana, and other individual supports provided by Akana and Laborers. When asked about what kinds of non-financial support they received, participants most commonly mentioned assistance with personal budgets and mentorship (one-on-one as well as group

interactions). In responding to open-ended questions, participants did not differentiate between programs funded by BOLI/ODOT and other organizations (such as apprenticeship programs, unions) or from individuals (such as co-workers). Some also referred to non-financial support they received during their pre-apprenticeship program as well as ongoing support from these pre-apprenticeship programs. We include information on all the types of non-financial support that respondents mentioned.

Among those who described receiving a budget class, all but one described it as helpful (this participant said the budget class was "too basic"). In open-ended questions participants described the type of non-financial assistance they received and how it helped them:

> I received the budgeting class. I learned how to budget for a lay-off… It allowed me to be more conscientious about the way I spent my earnings. (Native American Woman)
>
> During my pre-apprenticeship, we had to create a financial budget that was longitudinal, for the year. So we could understand how we needed to stretch our resources and be able to build a toolset and clothing and the necessary materials to be successful on the job... [It helped me] by helping me fiscally manage my use of funds and resources. (white woman)

Individuals who described receiving any type of mentoring specifically mentioned receiving advice, information, support, and motivation. Below are participants' responses to open ended questions about the kinds of non-financial support they received and how it helped them:

> [I received mentoring from] Oregon Tradeswomen. I had continual access to community support with people experiencing similar situations as I am. (white woman)
>
> I received non-financial support through the carpenters' union… It really prepared me through the carpenter union. I learned about the history, culture and other supportive services. I even met other women during this period. (Asian woman)
>
> I got a number to call a journeyman to ask about their experiences… It helped with adjustment. It's a different world and sometimes you don't know the lingo. (white woman)
>
> Another woman on my job site gave me the encouragement and support to keep going because I didn't think I was going to make it. I didn't think I was right for the job. Just by her being there it gave me the support and motivation to keep going. The director of the trading center goes out of his way to know all of our names and really make us feel like people. That helps a lot. Our union reps are also really supportive. A few of the journeymen I have worked with have gone above and beyond also… They gave me confidence, made me feel welcome, and believed in me when I didn't believe in myself. (white woman)

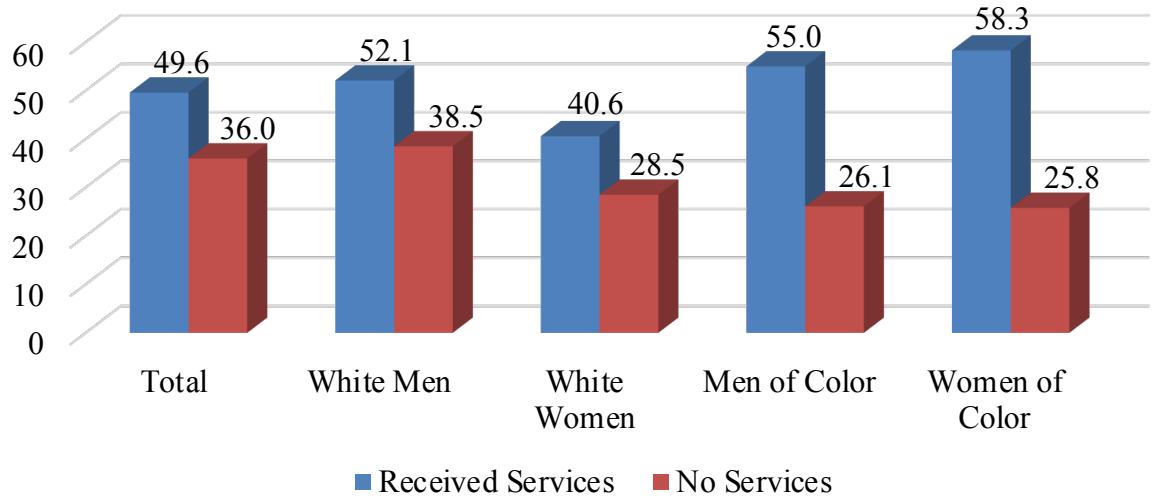
Pre-Apprenticeship. Among apprentices who completed a pre-apprenticeship, 90% said the pre-apprenticeship taught skills they needed to begin their apprenticeship. A greater percentage of men (100%) than women (89%), however, reported this. As noted above, pre-apprenticeships were mentioned in open-ended questions when participants were asked about receiving non-financial services. As one participant reported:

> I am involved with OTI and I did a pre-apprenticeship program and have continued to receive mentorship from them… It helped me be successful because I didn't know a lot. I was able to connect to social hours with other women in the trades. (white woman)

Evaluating the Effect of Supportive Services on Retention and Completion

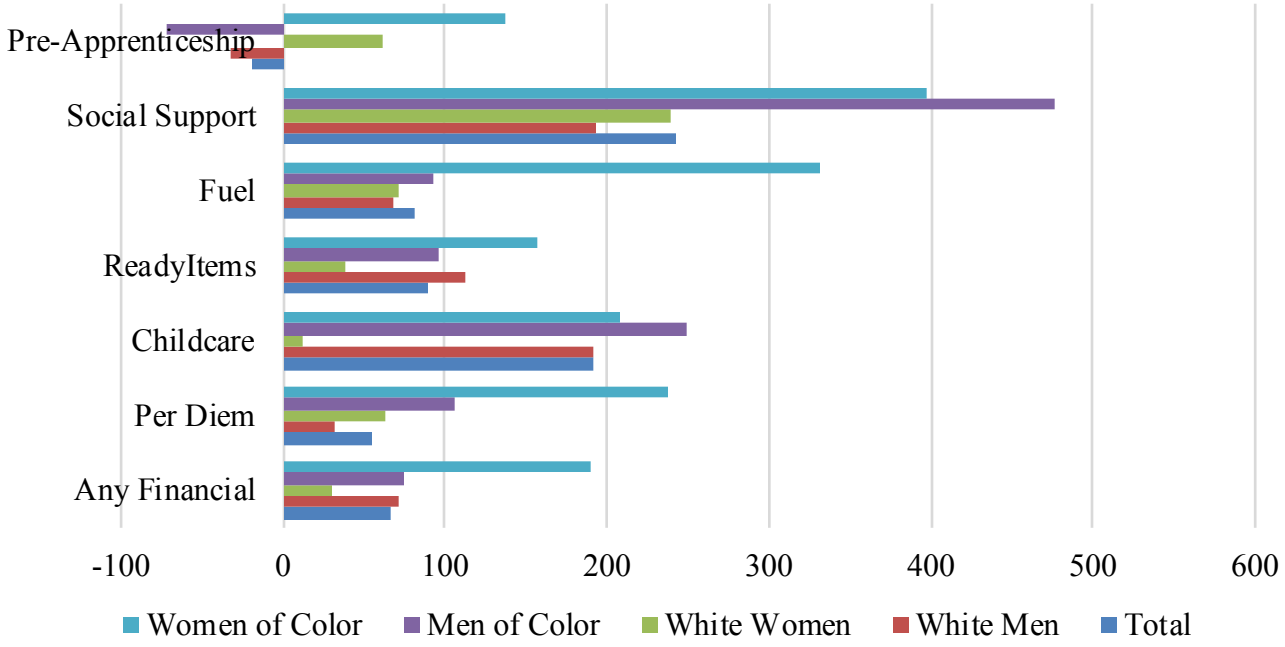
It is important to note the effectiveness of ODOT-BOLI supportive services in assisting apprentices in completion of their apprenticeship. Among 2005-2017 cohorts of apprentices in eligible trades who completed or terminated their apprenticeship by the end of 2017, those receiving ODOT-BOLI financial or non-financial support services were more likely than those not receiving these services to complete their apprenticeships (Figure 1). The effect of support services on completion was largest for women of color, with 58% of those receiving support services completing, compared to 26% of those without services completing.

Figure 1. Completion Rates among Apprentices in Eligible Trades by Recepit of ODOT-BOLI Services, by Race and Gender
(OAS Data, 2005-2017 Cohorts)



Among all race-gender groups except white men, non-financial supportive services, in the form of social support or mentoring, had a larger effect on completion than did any one type of financial support service (Figure 2). Among white men, financial support for childcare had the largest estimated effect on completion, followed by social support. Similar to the 2014-15 reporting period results, we see negligible effects of childcare support on completion among white women (in the 2014-15 reporting period the effect of childcare support on completion among white women was negative). Because we are unable to control for parental status when analyzing OAS data, we are unable to determine if negligible effects of childcare support are due to factors associated with parental status, not the childcare support itself. Among parents receiving child care support who completed the 2018 survey, 0% had cancelled and 70% had completed an apprenticeship (see Appendix J). Yet only ten parents in the survey sample had received child care support, the majority of whom were fathers, so this association should be interpreted with caution. It is important to note that among survey respondents, mothers were much more likely than fathers to be single parents and more likely to rely on paid child care (Appendix J).

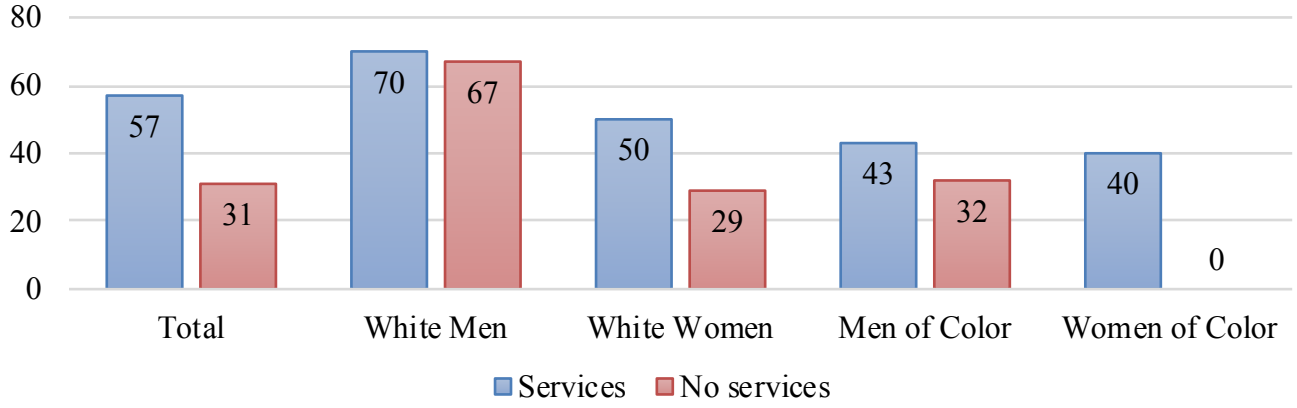
Figure 2. Estimated Percent Change in Odds of Completing an Apprenticeship when Receiving ODOT-BOLI Supportive Services, by Race and Gender (2005-2017 Apprentices in Eligible Trades, OAS Data)



Results in Figure 2 also show that men (but not women) completing a pre-apprenticeship program were *less* likely than those not completing a pre-apprenticeship program to complete an apprenticeship. This is similar to last report's findings with the caveat that the last report indicated both men and women completing pre-apprenticeships were less likely to complete an apprenticeship. The current finding about men, however, 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 2017b). Pre-apprenticeship programs such as Constructing Hope attract workers with challenges that make it difficult to complete an apprenticeship program. Results from the 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 (Appendix K).

In addition to completion rates, it also important to consider the impact of ODOT-BOLI supportive services on continuation in the construction trades after apprenticeships are completed. Figure 3 shows the percentage of apprentices in eligible trades who are working as journey workers after apprenticeship. Those in eligible trades receiving ODOT-BOLI supportive services are more likely than those not receiving services to be working as a journey worker after their apprenticeships (57% vs. 31%).

Figure 3. Percentage of Completed Apprentices in Eligible Trades Working as Journeyworker, by Service Receipt
(2018 Survey Data)



Finally, we consider income and public assistance use before and after apprenticeship given the role that economic resources play in successful completion. Results from the 2018 survey indicate that service recipients report less individual and household income prior to apprenticeship than do those not receiving support services. Yet these differences in income are minimized after apprenticeships begin. For example, while 39.6% of financial support recipients reported household income less than or equal to 100% of the federal poverty level prior to apprenticeship (compared to 19.3% of those not receiving services), only 9.4% of respondents receiving financial services reported this income level during their apprenticeship (compared to 4.8% of those receiving no services) (Appendix K). The difference in income before and after apprenticeships is most dramatic among those receiving both financial and non-financial supports (compared to those receiving neither type of service) and among those completing pre-apprenticeships (compared to those not completing pre-apprenticeships). Similar to the ways in which each financial support service interact to impact apprentices' overall financial lives, financial and non-financial supports are likely interrelated. For example, non-financial support services may help apprentices better manage their finances and may also provide access to additional services such as unemployment benefits or public assistance.

WORKFORCE DIVERSITY TRENDS IN OREGON'S HEAVY HIGHWAY TRADES

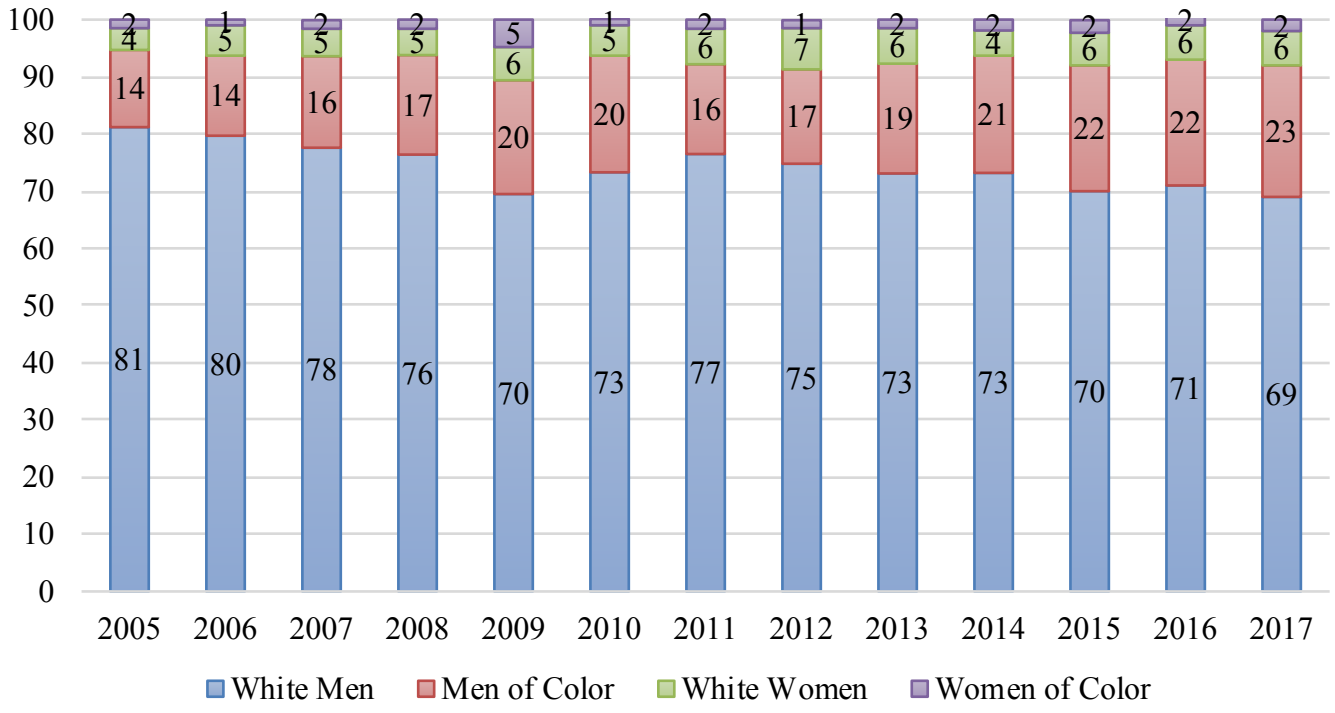
In this section, we look at the broader picture of workforce diversity trends in Oregon's heavy highway trades. First, we provide data on trends in recruitment of apprentices. Next, we assess retention. Finally, we examine work experiences following apprenticeship and reasons for leaving

Recruitment

The number of new apprentices each year in the heavy highway construction trades fluctuates as workforce demands fluctuate. Enrollment rates were relatively stable between 2013 and 2015, when approximately 1600 apprentices entered each year. Since 2015, enrollment has increased, with 2259 enrolled in the 2016 cohort and 2507 enrolled in the 2017 cohort (Appendix A). While white men continue to comprise the overwhelming majority of new apprentices, between 2011 and 2017 the percentage of new apprentices accounted for by white men declined from 77 to 69 percent (Figure 4), as women and

people of color account for a greater share of new apprentices. Between 2011 and 2017 the percentage of new apprentices who were women has remained relatively steady (7.7% in 2011 compared to 7.9% in 2017), while people of color accounted for a greater share of new apprentices, increasing from 17.3% in 2011 to 25.3% in 2017. These recent trends are evidence of continued progress in the diversification of the heavy highway trades workforce.

Figure 4. New Apprentices in Oregon Heavy Highway Construction Trades by Race and Gender, 2005-2017 Cohorts

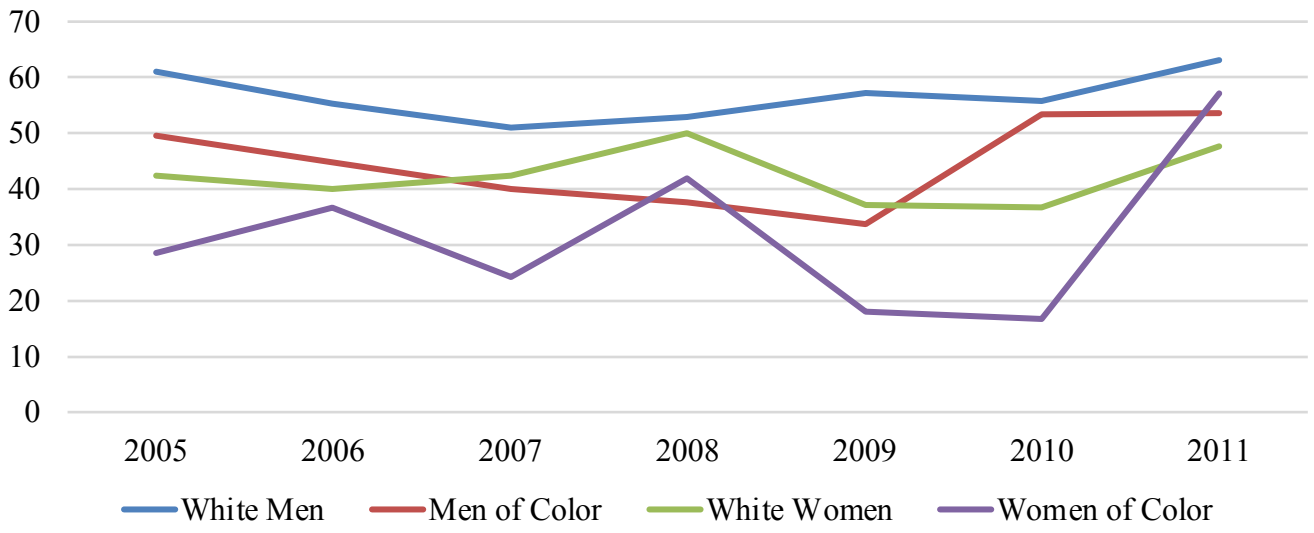


Retention

The previous reports released in 2014 and 2016 suggested that while progress has been made in diversifying new cohorts of apprentices, rates of completion by race/ethnicity and gender have been "stuck in neutral" (Burd-Sharps, Lewis, & Kelly 2014, p. 13). This conclusion was based on trends in six-year completion rates (% in each cohort completing in six years) as well as trends in the percentage completing among those completing or terminating during each reporting period. We update completion trends by race/gender using these two indicators of completion.

We first examine six-year completion rates by race-gender groups for the 2005-2011 cohorts (Figure 5), updating the previous report that analyzed six-year completion rates for the 2005-2009 cohorts. Overall, six-year completion rates have increased since the last reporting period. The overall six-year completion rate for the 2009 cohort was 50.4, compared to 60.5 for the 2011 cohort. The six-year completion rate increased for all race-gender groups between 2009 and 2011 cohorts.

Figure 5. Six-Year Completion Rates by Race and Gender, 2005-2011 Cohorts



While six-year completion rates are likely more accurate measures of completion, we are unable to assess the completion rates of newer cohorts of apprentices this way. When completion rates are measured as the percentage of active apprentices in 2016-17 who completed rather than terminated, we also see progress in completion rates across the 2014-15 and 2016-17 reporting periods (Table 3). Although ODOT-BOLI performance goals have not yet been met in the current reporting period, completion rates for all race-gender groups except men of color have increased since last reporting period, and all completion rates are nearing 50%.

Table 3. Completion Rates by Reporting Period and Race-Gender

	2011-2014 Reporting Period				
	Total	White Men	Men of Color	White Women	Women of Colo
% Completing (among those completed or terminated)	64.7	68.1	51.9	54.7	41.9
	2014-2015 Reporting Period				
	Total	White Men	Men of Color	White Women	Women of Colo
	48.3	50.7	44.9	36.3	24.2
	2016-2017 Reporting Period				
	Total	White Men	Men of Color	White Women	Women of Colo
	52.5	56.8	40.6	42.9	46.9

Source: Authors' analysis of OAS data; Burd-Sharps, Lewis, & Kelly 2014

Work Experiences Following Apprenticeship and Reasons for Leaving

While having apprentices complete their apprenticeships is optimal, some apprentices decide that the highway construction trades are not well suited for them, for a variety of reasons, and may choose to leave their apprenticeship. In the 2018 survey, 67 participants had left their apprenticeship without completing. Similar to results from the 2014 and 2016 surveys, choosing to leave an apprenticeship continues to be

much more common than being asked to leave an apprenticeship: of apprentices surveyed in 2018 who did not complete their apprenticeship, 88% reported choosing to leave, while only 6% reported being asked to leave (Appendix F). However, some participants who report choosing to leave may have been forced out through harassment, a lack of work, or a lack of training on the jobsite.

When asked why they left (or were asked to leave) their apprenticeship, the most common responses were: finding a new job because they did not like the work (e.g. travel, "it wasn't for me"), finding a new job to make more money (some noted they found other work in construction), personal or family issues (including pregnancy and child rearing), being out of work too much or not making enough money, and physical demands of the job or injury. One participant reported leaving because of harassment: "the journeymen that were supervising me were showing me inappropriate pictures."

Among 2018 survey respondents, those not completing experienced, on average, close to two months of unemployment in the previous year, compared to less than one month among those who completed their most recent apprenticeship (Appendix F). Among 2018 survey respondents, there are also differences in individual and household income between those who completed and those who terminated their apprenticeship. While 63% of 2018 survey respondents who completed their apprenticeship had a household income greater than 335% of the federal poverty level in the year after completion, only 29% of those who terminated did. In fact, among those who terminated, 22% had a household income at or below the federal poverty level in the year after termination, compared to only 3% of those who completed their apprenticeship. Similarly, those who terminated rather than completed were more likely to have individual income that fell at or below federal poverty levels and much less likely to have individual income above 335% of the poverty level. Women who terminated were more likely than men to have individual income at or below the federal poverty level after their apprenticeship, but we do not see these gender differences for household income, perhaps because of the gendered division of labor within households. We also find that respondents from the 2018 survey who completed were more likely to say they never struggled to make ends meet after apprenticeship, relative to those who terminated. Among those who terminated, women were more likely than men to report they struggled to make ends meet always or often. Those who left before completion are also more likely than those who completed to be receiving public assistance after their apprenticeship (20% vs. 3%) with white men who did not complete the most likely to be receiving public assistance.

Among apprentices who completed, 82% of respondents surveyed in 2018 reported becoming journey workers, with a greater percentage of men than women who completed becoming journey workers (84% vs. 80%), which is consistent with previous survey results. Those who left before completion were more likely than those who completed to be working in a non-construction job (55% vs. 1%).

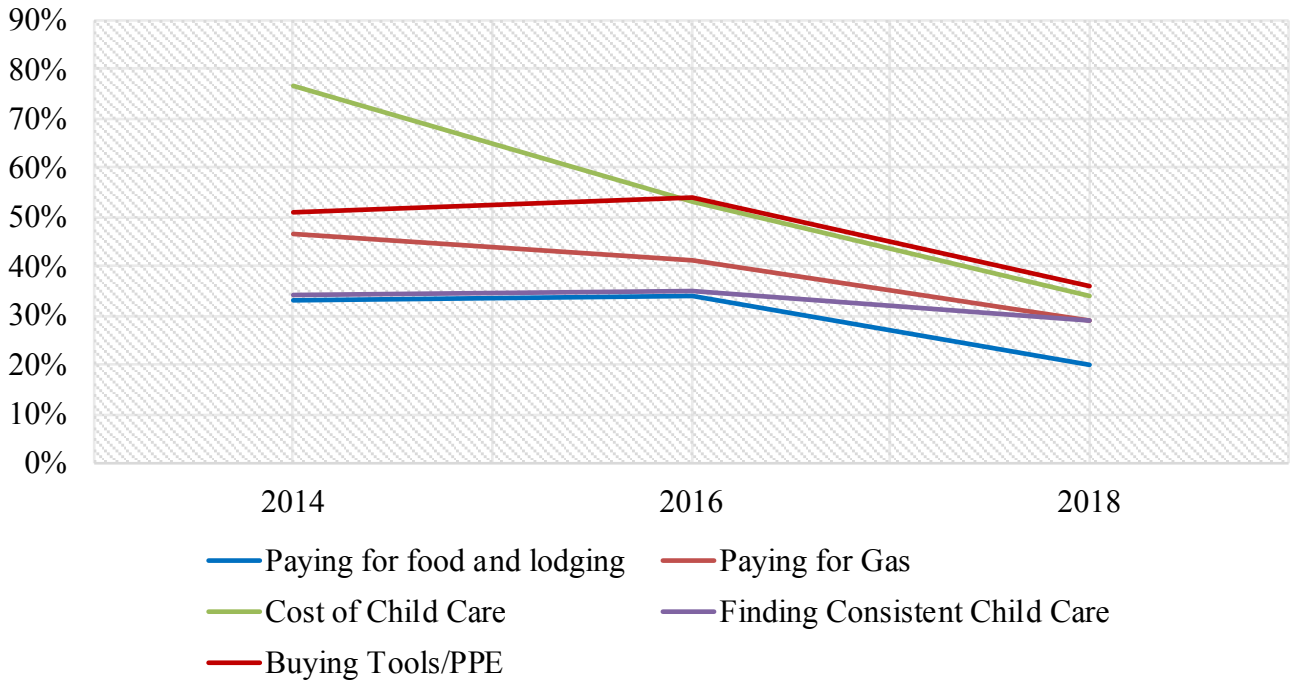
MAJOR CHALLENGES FACING APPRENTICES

One major aim of our biennial survey is to assess the challenges current and former apprentices face on and off the jobsite, to assess whether perceptions of challenges are changing over time, and to assess whether there is any association between challenges and apprenticeship completion. We identity three major challenges that apprentices face: financial challenges, workplace culture and discrimination, and lack of work and lack of training.

Financial Challenges

In general, we find that the proportion reporting job related challenges has declined since the 2014 survey (Figure 6). Cost of child care and purchasing tools/PPE are still the challenges most frequently reported by apprentices, however. In the 2014 survey, the cost of childcare emerged first among the challenges apprentices faced, as 77% of apprentices with dependent children in the home identified child care as either a "major problem" or a "minor problem." By 2018, the percentage of parents identifying the cost of childcare as a problem had declined to 34%. It is possible that declines in percentage of apprentices reporting financial challenges is due to the current strength of the economy and growth in the construction industry, which leads to more work and less financial hardship.

Figure 6. Percent of Apprentices Reporting Challenges as a "Major" or "Minor" Problem, by Survey Year
(2014, 2016, and 2018 Surveys)



In previous surveys we found that men and women reported different challenges at different rates, in ways to be expected given traditional gender norms. Results from the 2018 survey confirm this. For example, concerns about cost of child care are higher among mothers than among fathers, with 45% of mothers and 26% of fathers identifying cost of child care as a problem (Appendix E). Similarly, 41% of mothers and 21% of fathers reported finding consistent child care was a problem. Not surprisingly, mothers are also less likely than fathers to rely on a spouse or partner to help with child care (18% vs. 46%; Appendix C), reflecting the persistent gendered division of labor in which women are expected to work within the home and men are expected to work in the paid labor market. In our 2018 sample, women of color were the least likely of all race-gender groups to have a spouse or partner helping with child care (13%), relying more heavily on paid child care providers (Appendix C).

In our biennial surveys, men have been, in general, more likely than women to report living with a spouse or partner during their apprenticeship. Historically, among workers in non-traditional occupations, women are more likely than men to be single, separated, or divorced (Jurik and Halemba 1984; Walters 1992) perhaps in part due to the negative impact of nontraditional gender ideologies on marital stability (Greenstein 1995). Heterosexual married women are, in addition, more likely than heterosexual married men to drop out of the labor market or to switch jobs in response to family demands (Bielby and Bielby 1992; Gjerdingen et al. 2001).

Previous research suggests that working outside of the home in non-traditional settings is less normative for White women than for women of color: minority women, often due to financial necessity, have historically had less choice about working in the labor market in nontraditional jobs. In addition, roles within Black families have historically been less gender-differentiated than those within White families (Johnson and Staples 1993). Given previous research, we might expect heterosexual white women to be least likely of all race-gender groups to report having a spouse/partner during her apprenticeship and heterosexual white men to be most likely of all race-gender groups to report having a spouse/partner during apprenticeship. In the 2018 survey, however, heterosexual *women of color* were the least likely to report having a spouse/partner during their most recent apprenticeship (39%), followed by sexual minority women of color (42%) and heterosexual white women (48%). This is compared to 59% of heterosexual white men and 60% of heterosexual minority men. Interestingly, 66% of sexual minority white women in the 2018 survey reported having a spouse/partner during their apprenticeship. Heterosexual women of color surveyed were also the least likely group to be partnered with children (16%) during their apprenticeship, compared to 41% of heterosexual minority men.

While heterosexual women of color were the least likely of all race-gender groups to report having a spouse/partner during their apprenticeship, these women were overrepresented among women of color who had completed an apprenticeship: 60% reported having a spouse/partner, while 40% did not. This pattern is similar among all other heterosexual race-gender groups except white women: among heterosexual white women who completed an apprenticeship, only 37% reported having a spouse/partner during their apprenticeship. These association held among women with or without children and regardless of the age of children. The impact of having a spouse/partner on completion appears to be more detrimental among white women. More research should explore the experiences of women as they negotiate marriage and family during their apprenticeships.

In addition to race/ethnicity and gender as factors impacting perceptions of child care challenges, household income is also a factor: apprentices with household incomes at or below the federal poverty level were the most likely of all income groups to report the cost of childcare as a challenge (50% vs. 16% for highest income group; results not shown).

Similar to child care challenges, other financial challenges have decreased across survey periods. The most common challenge, other than the cost of child care, has been buying tools/PPE, and reports of this challenge has declined over time: while 51% of apprentices in 2014 identified buying tools/PPE as a problem, 36% of apprentices identified this as a challenge in the 2018 survey (Appendix E).

Gender differences across financial challenges are evident in the 2018 survey, as women were more likely than men to report the following as challenges: being out of work too much (35% vs. 26%), performing low skill tasks (46% vs. 28%), lack of mentoring (45% vs. 29%); paying for food and lodging (26% vs.

17%), and buying tools and equipment (41% vs. 33%). Women of color continue to be more likely than white women to report challenges such as being out of work too much and performing low skill tasks, and men of color reported challenges with paying for gas, food/lodging, and tools/equipment at a greater rate than white men (Appendix E). The likelihood of reporting these additional financial challenges also varies by household income, with those in the lowest income category most likely to report these challenges (results not shown).

It is important to consider the associations between challenges faced by apprentices and completion of apprenticeship. We examined the correlations between challenges and completion among 2018 survey respondents who completed or terminated their apprenticeship (Appendix L). Among women, the financial/resource factor most *positively* associated with completion was individual income, followed by the presence of children in the home and receiving unemployment benefits during apprenticeship. Reporting being out of work too much was the challenge most *negatively* associated with completion among women, yet problems paying for gas, paying for tools, finding a mentor, and being assigned low skill tasks were all negatively associated with completion among women. Among men, individual income was also the factor most *positively* associated with completion, followed by receiving unemployment benefits during apprenticeship. Reporting being out of work too much was the challenge most negatively associated with completion among men; problems being assigned low skills tasks, finding a mentor, and paying for transportation were also negatively but weakly associated with completion among men. While associations were relatively weak, having a spouse/partner was positively associated with completion among men yet negatively associated with completion among women, and the association between having children in the household was positively associated with completion for both men and women (stronger among women).

Workplace Culture and Discrimination

While workplace culture continues to be a major challenge faced by apprentices, rates of reported discrimination due to gender and race/ethnicity declined among survey respondents between 2016 and 2018. While 67% of women of color and 60% of white women reported experiencing discrimination due to gender in 2016, this was down slightly to 60% of women of color and 53% of white women among 2018 survey respondents (Figure 7). Similarly, 35% of women of color and 30% of men of color reported racial/ethnic discrimination on the job in the 2016 survey, yet this was down to 24% and 22%, respectively, in the 2018 survey (Figure 8).

Figure 7. Percentage of Women Reporting Discrimination Due to Gender, by Race (2016-18 Survey Data)

Figure 8. Percentage of Racial/Ethnic Minorities Reporting Discrimination Due to Race, by Gender
(2016-18 Survey Data)

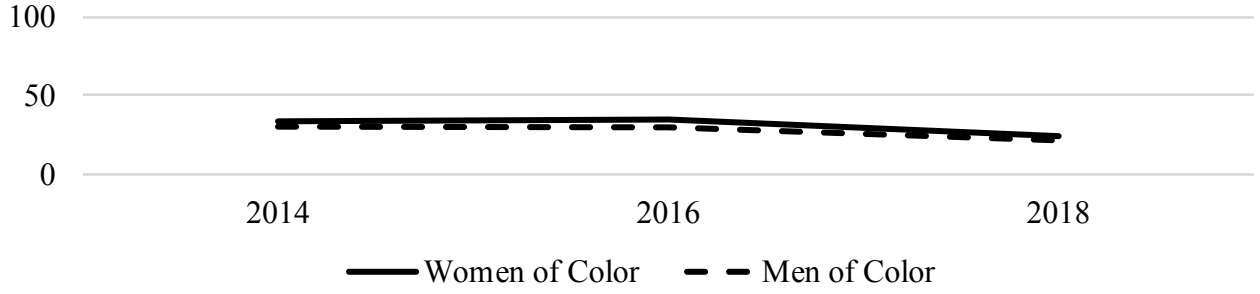


Figure 9. Percentage of Apprentices Experiencing Discriminaton, by Race and Gender (2018 Survey Data)

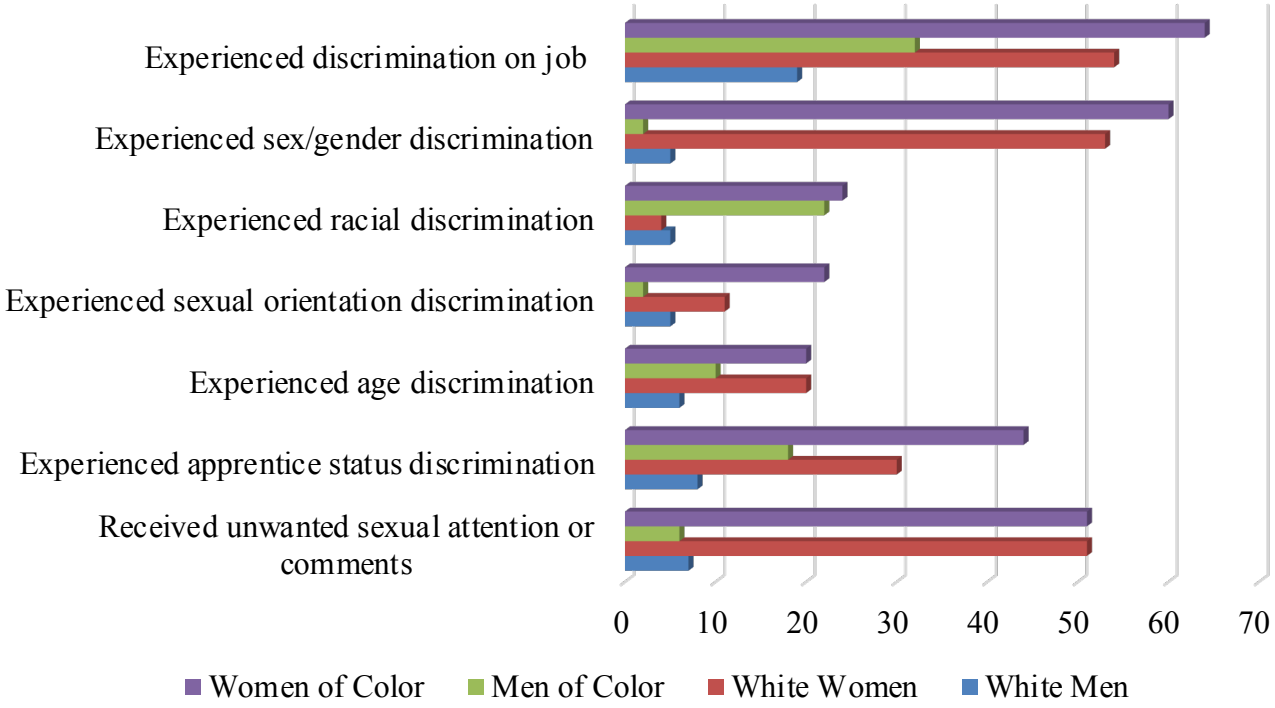


Figure 9 illustrates rates of on the job discrimination by type of discrimination and race-gender groups. Women, particularly women of color, reported discrimination at the highest rates, followed by men of color and white men. Nearly 65% of women of color and 54% of white women reported experiencing any type of discrimination on the job in their last year of their apprenticeship, while 32% of men of color and 19% of white men reported experiencing any discrimination (Appendix E).

Looking at types of discrimination by race-gender groups, women reported high rates of gender discrimination: 60% of women of color and 53% of white women surveyed reported gender discrimination. Women also reported high rates of unwanted sexual attention: 51% of white women and 51% of women of color reported unwanted sexual attention or comments. Rates of racial/ethnic discrimination are lower than those of gender discrimination, yet 24% of women of color and 22% of men

of color reported racial/ethnic discrimination on the job in the past year. A smaller percentage of apprentices reported discrimination due to sexual orientation, with women of color reporting this type of discrimination at the highest rate (22%). Age discrimination was also less common but more likely to be reported by women (20%). Next to gender discrimination, the most common type of discrimination reported was discrimination due to apprentice status, with women of color (44%) and white women (30%) much more likely to report this type of discrimination than their male counterparts (15%). Men of color were more likely than white men to report discrimination based on apprentice status (18% vs. 15%).

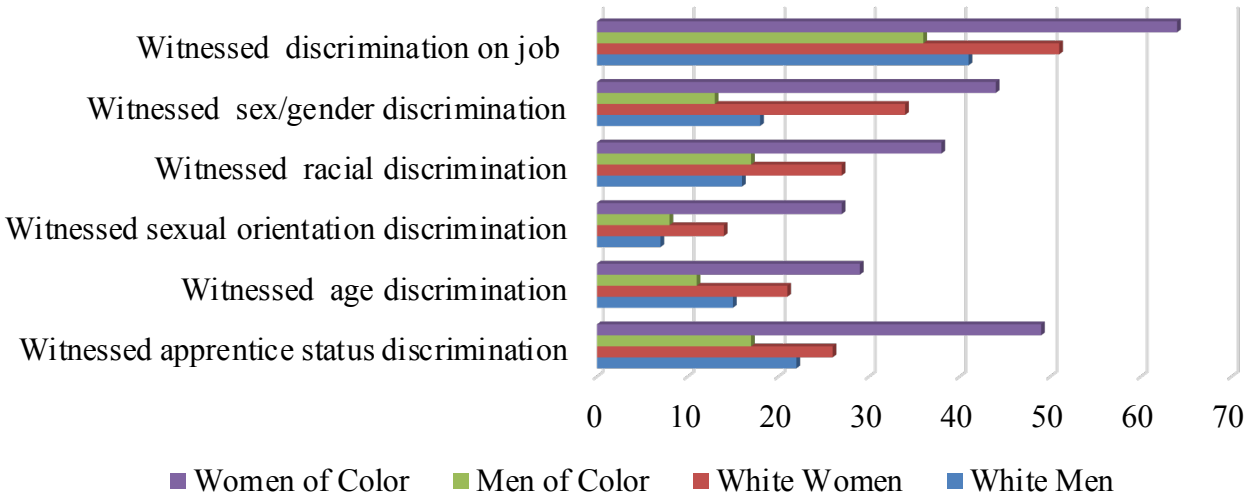
In the 2018 survey, participants were first asked whether or not they had experienced discrimination based on gender, race, sexual identity, age, apprenticeship status, or any other identity (see above). They were then asked to briefly describe the discrimination they experienced. Below are some representative responses:

> I have been groped in hallways and stairwells on various jobs. It was intentional… I have also been told that I can't do a job because I am a girl. I have been called names such as honey, baby doll, and girl. A majority of the time when there is a gathering of male journeymen speaking, when I enter the space they walk away so that I can't hear what they are saying or what they are looking at. They also point at me and change the subject. I have been asked for my number with the men saying, "Hey give me your number so we can hook up later." (white woman)
>
> There were a couple people drawing male genitals on my tools. I wasn't sure if it was because my gender or because I was an apprentice. (Native American woman)
>
> I experienced some sexual harassment, and people did not want to work with me because I was female. Some people did not think that I was capable because of my gender. (white woman)
>
> People would say things like, “You're a woman, you can’t do this, you can't lift that” or things like, “Why do you have a wife? You should be with a guy.” Making fun of me for having a baby with my wife. (white woman)
>
> One time, around some young people they tried to exclude me and ignored me and made comments about my age and my being a woman. (white woman)
>
> There was racist graffiti on the portable toilets and the staircases at the job sites. (Latina)
>
> I was called a nigger and have had nigger written on my car. (African American man)
>
> I got called a nigger lover because my kids are black. (white man)
>
> My nickname was dumbass and junior or kid. (white man)

The 2018 survey was the first time apprentices were asked about witnessing other workers experience discrimination on the job (Figure 10; Appendix E). Trends in *witnessing* discrimination by race-gender are strikingly similar to reports of *experiencing* discrimination on the job, with women of color (64%) most likely to report witnessing any type of discrimination on the job in the last year. Women were more

likely than men to report witnessing discrimination based on gender, race/ethnicity, sexual orientation, age, and apprentice status.

Figure 10. Percentage of Apprentices Witnessing Discriminaton, by Race and Gender (2018 Survey Data)



In sum, participants continue to report high rates of discrimination or harassment based on various identities, particularly gender and race/ethnicity. Reports of gender and racial discrimination are, however, slightly lower in our 2018 sample relative to our 2016 sample. Continued high rates of experiencing workplace discrimination in combination with high rates of *witnessing* discrimination demonstrate that construction sites commonly represent hostile work environments for some workers, particularly those with marginalized identities.

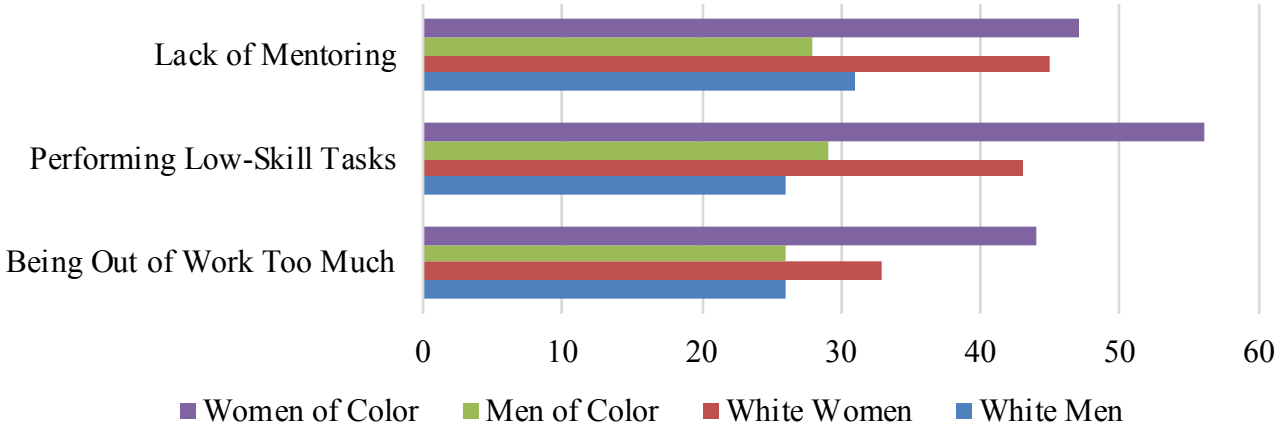
While women and racial/ethnic minority apprentices were most likely to report experiences of harassment, white men also reported feeling disrespected at work, even reporting gender and racial discrimination on the job. Such reports by white men raise questions about how discrimination/harassment on the worksite is defined and the potential for a white (male) backlash against attempts at reducing gender and race/ethnic discrimination on constructions sites.

Importantly, additional analyses of 2018 survey data (Appendix I) indicate a negative association between reports of discrimination and completion: among survey respondents leaving their apprenticeship, 60% reported any type of discrimination, compared to only 33% of apprentices who completed their apprenticeship. Similarly, while 45% of apprentices leaving their apprenticeship reported gender discrimination, only 15% of those completing reported gender discrimination. In correlational analyses of 2018 survey data (Appendix L), we found moderate negative correlations between reports of discrimination and completion, with the strongest negative correlation between discrimination due to apprentice status and completion. Results are similar among men and women, although associations are stronger among women than among men.

Lack of Work and Lack of Training

In the 2018 survey, apprentices continued to note challenges with being out of work too much, not receiving mentoring or training on the job, and doing low-skill tasks not related to their trade (such as flagging or cleaning). Notably, women of color and white women consistently reported these challenges at higher rates than their male counterparts (Figure 11; Appendix E). The percentage identifying these aspects of work as challenging, however, is lower among our 2018 sample compared to the 2016 sample, perhaps a result of the relatively strong economy during the current reporting period and/or the effectiveness of financial support services. While more than 70% of women of color reported being out of work too much as a problem in the 2016 survey, this was down to 44% in the 2018 survey.

Figure 11. Percentage Reporting Challenge as a Major or Minor Problem, by Race and Gender (2018 Survey Data)



Apprentices were also asked how many months they were out of work in the most recent year of their apprenticeship. Similar to results from the 2016 survey, men reported, on average, the fewest number of months out of work (1.0), with women of color reporting the greatest number of months out of work (2.1) (Appendix C). As a sign of a strong economy and booming construction industry characterizing the current reporting period, only 14% of 2018 survey respondents reported being out of work for more than three months in the past year. This is compared to 49% of apprentices reporting being out of work for more than three months in the 2016 survey.

In the open-ended question asking about discrimination they experienced, apprentices also reported a variety of experiences of discrimination. In addition to the harassment described in the previous section, participants reported a lack of mentoring, or being given the opportunities to learn the skills of their trade. When apprentices are not being appropriately mentored or trained, they often experience isolation and/or being assigned low-skill tasks not related to their trade, such as cleaning the job site. Apprentices also reported work hours or job assignments being unfairly assigned, which led to some participants experiencing being out of work too much. Below are some representative responses about the discrimination participants experienced:

> They give me light duty work because I am a girl. They won't send me to certain jobs because some foremen refuse to work with women. (white woman)

> I have been let go and under-taught because I am a female. I have had journeymen tell me that they do not work with me because I am a female. I have spent the whole day sweeping while my male counterparts were learning skills and trades. I have been unemployed consistently because I am a female. (African American woman)
>
> I was isolated and ignored because the men thought it was better to ignore the female on the job site than to risk sexual harassment complaints. (white woman)
>
> Because I'm a girl, they think I can't do certain things. They don't let me do stuff that I really need to learn how to do. (Latina)
>
> I was turned down for jobs that I knew were available. I called repeatedly and followed through, but no one would hire me except for one person who had me doing errands only. (white woman)
>
> I was the first to be let go off a job. My performance was as high, or higher than others, but I was the first let go. (Asian man)
>
> I am usually the only minority working at most jobs. When it's time to let people go, I am usually the first on the list. Since I started, a lot of journeymen pick and choose who they want to take under their wings. Not for me. Racial jokes and stuff like that, but you don't say anything because you don't want to lose your job. (African American man)
>
> I've been let go from jobs due to the fact that I am a woman. I was told by a foreman that if I didn't fuck him I would be fired. (white woman)

Job cultures with prevalent harassment and discrimination can potentially negatively impact productivity and safety; our participants reported a number of examples of issues directly related to productivity and/or safety.

> One time I got told to dig a hole, but my supervisor took all the shovels and I had to use the back of my hammer. (white woman)
>
> [I experienced] isolation, working on non-meaningful tasks, being ignored, not being spoken to by management or foreman. I had graffiti, "nigger," written on my ladder. Sometimes they would steal my ladder and hide it. (African American man)
>
> I would be left alone to do a job with no instructions with a lot of expectations. I would tell them I needed instructions and they would just ignore me. Now I just do whatever I am told, even if I don't know how to. (Latino)
>
> I got fired from a job for bringing up a safety hazard. (white man)
>
> I wasn't allowed to take breaks to get water or use the bathroom in 100 degree weather. (white woman)
>
> [They] withheld safety equipment such as kneepads, helmets (white woman)

> The guys were making fun of me because I wasn't as quick as they were. The foreman said I had a good work ethic, but I wasn't a good fit with the guys and tasks. The man who ran the excavator punched me in the chest, and I asked him why he did that, but he walked away. I got bad-mouthed by the guys, too. They let me go, and brought another apprentice to replace me because he was a guy. (white woman)
>
> One time [a coworker] pulled out a pocket knife and told me to kill myself, but said since I was a woman I would probably do it wrong. He proceeded to show me how to do it right. (white woman)
>
> One instance I was discriminated against because I am gay. The guy told me that he would kick my ass because I was gay. (white woman)

In sum, the harassment and discrimination that apprentices face can have direct and indirect effects on their success in their apprenticeship. Based on these reports of discrimination experienced and observed, many jobsites fall short of being respectful workplaces.

PROGRESS TOWARDS THE GOALS OF THE HIGHWAY CONSTRUCTION WORKFORCE DEVELOPMENT PROGRAM

In the following section we identify progress toward goals established by ODOT-BOLI in 2016. We highlight where progress has and has not been made and then offer recommendations for continued efforts at diversifying the skilled highway trades workforce. Appendix H displays key performance measures for the previous (2016) and current (2018) reporting periods and indicates whether the policy goals set by ODOT-BOLI have been met and/or if progress is being made. Key performance measures are divided into four areas: outreach and recruitment, supportive services, workplace culture, and diversity of journey workforce (see Appendix H).

Outreach and Recruitment

Since the previous reporting period, progress continues to be made in recruitment of both white women and men of color in the highway construction trades. The goal for women of color and men of color was met in the last reporting period, and the current percentages are consistent with or above those from last reporting period. The percentage of new cohorts who are white women, however, is still below the goal of 8%, yet the percentage has increased slightly from 5% to 5.8% since the previous reporting period.

Supportive Services

In the area of awareness and use of supportive services, a number of goals that had not been met in the previous reporting period have been met in the current reporting period. This includes percentage of eligible men of color and women of color aware of ODOT-BOLI supportive services as well as the percentage of eligible men of color receiving financial services. While we continue to see progress in the percentage of eligible women receiving mentoring, or social support services, these performance goals still have not been met. In addition, we have not seen an increase in the percentage of eligible men of color receiving mentoring services. More work needs to be done to increase the number of women and people of color utilizing the social support services provided through the Workforce Development Program.

Workplace Culture

Continued effort needs to be made in changing perceptions of workplace culture for apprentices in the highway construction trades. Since the previous reporting period, some progress has been made in the percentage of white women and men of color reporting race or gender discrimination/harassment in the past year. Progress continues to be stalled, however, in reports of discrimination/harassment due to race or gender by women of color. Similarly, a high percentage (81%) of white women continue to report some type of discrimination or harassment on the job. None of the performance goals under Workplace Culture have been met.

Diversity of Journey Workforce

Recruitment and retention efforts are paying off with greater diversity among those completing apprenticeships. This reporting period the six-year completion rate goal for men of color was met, and overall completion rate goals for white women and women of color have been met. In addition, the performance goal for percentage of completed who are women of color has been met, and there has been an increase in the percentage completed who are white women. Beyond completion of apprenticeship, the Workforce Development Program aims to place apprentices as journey workers in their trades. Based on survey results, among those completing their apprenticeship, 83% of white women and 80% of men of color were working as journey workers. Performance goals for these two measures have been met with progress still needed in percentage of women of color moving into journey worker positions after completion.

RECCOMENDATIONS FOR INCREASING THE DIVERSITY OF THE CONSTRUCTION WORKFORCE

We present several recommendations for increasing the diversity of the construction workforce, based on the data from this report, previous reports, and previous research on diversity in the construction workforce, as well as policy recommendations from the Equal Employment Opportunity Commission (EEOC), The Institute for Women's Policy Research (IWPR), National Women's Law Center (NWLC), the Policy Group on Tradeswomen's Issues (PGTI), and a 2018 report conducted for Portland Metro.

Our recommendations for improving recruitment and retention of diverse workers include:

- Continue efforts to recruit diverse workers into apprenticeships
- Strengthen and expand pre-apprenticeship programs and retention services throughout the state
- Improve engagement with the broader community and with youth
- Promote respectful workplaces
- Ensure equal opportunities for employment during apprenticeship
- Improve quality of on-the-job training during apprenticeship
- Continue financial supportive services; expand non-financial supportive services
- Continue efforts to promote awareness of ODOT-BOLI supportive services

A recent study sponsored by Portland Metro highlighted many of the same recommendations we have noted in this report. Below are barriers and summary recommendations for increasing recruitment and retention of a diverse workforce presented in the evaluation of Portland Metro:

TABLE 1. SUMMARY RECOMMENDATIONS FOR INCREASING RECRUITMENT OF A DIVERSE WORKFORCE

Goal	Barriers	Recommendations
Increase recruitment of diverse workers	• Funding for pre-apprenticeship programs is insufficient, inconsistent and from a variety of sources • Low recruitment rate of pre-apprenticeship graduates into apprenticeship programs	• Ensure steady funding stream to increase capacity of pre-apprenticeship programs • Increase direct entry from pre-apprenticeship into apprenticeship programs
	• Recruitment of all apprentices is primarily through referrals, which largely reproduces a white male workforce	• Promote recruitment of diverse workers through referrals
	• Entry process into apprenticeship and other opportunities in the trades are not known or accessible to the general public, including a lack of connection with K-12 • Outreach and marketing efforts are largely not targeted for marginalized communities • Current K-12 and community outreach efforts are not well coordinated across the region and the impact is unknown	• Coordinate additional outreach efforts across the region through partnerships with trusted community organizations and community leaders • Establish stronger collaboration and alignment across regional and state systems such as K-12, WorkSource, etc.

TABLE 3. RECOMMENDATIONS FOR INCREASING RETENTION OF A DIVERSE WORKFORCE

Goal	Barriers	Recommendations
Increase retention of diverse workers	• Construction culture is often hostile: proving yourself, harassment and isolation, overt discrimination	• Address construction job site culture through respectful workplaces trainings with proven results
	• Quality of on the job training can be disparate for diverse apprentices: ability to attain needed skills	• Increase monitoring of on the job training of apprentices by well-trained experts
	• Diverse workers have limited support for mentorship • Transitioning from apprentice to journeyworker challenges: skills and confidence, recognition and respect, finding work	• Formalize mentorship resources for diverse workers
	• Financial challenges (lower pay early in apprenticeship, being out of work) • Work/family conflict, affordability and access to childcare • Marginalized workers are less likely to have stable or consistent employment	• Increase ongoing supportive services for apprentices

Source: Haines et al 2018

Continue Efforts to Recruit Diverse Workers into Apprenticeships

Oregon has been increasing the percentage of female representation among new apprentices with 7.9% women (5.6% white women, 2.4% women of color) as well as increasing representation of men of color (currently 22.9%) in 2017. ODOT-BOLI's goals for the current reporting period were 10% women (8% white women, 2% women of color) and 20.6% men of color. PGTI argues for setting the goal for percentage of women higher, at 20 percent, by 2020 (PGTI 2016). While Oregon is closer to this goal than other states, there is still significant work to be done.

A recent report for Portland Metro found that apprenticeship program coordinators in the Portland, Oregon metro region reported that most apprentices successfully enter into apprenticeship programs through word of mouth or personal referrals (Haines et al 2018). Other efforts to recruit more broadly and/or recruit more diverse apprentices described by program coordinators included: encouraging referrals of diverse workers, pre-apprenticeship programs, engaging with K-12 students, career fairs, and advertising (radio, television). Career fairs and advertising were, however, often described as largely ineffective ways to recruit new apprentices (Haines et al 2018).

While Oregon's efforts to promote recruitment of a diverse workforce into apprenticeships in the trades have been succeeding and should be continued, there are ongoing issues with retention. In order to promote the long-term employment of disadvantaged workers in the trades, the issues impacting retention must also be addressed.

Strengthen and Expand Pre-apprenticeship Programs and Retention Services throughout the State

Pre-apprenticeship programs in Oregon have an important role in recruiting disadvantaged workers (with pre-apprenticeship as a pathway into the trades) as well as retention (through providing non-financial support to pre-apprenticeship graduates and/or other disadvantaged workers in the trades). Expanding support for pre-apprenticeship programs such as Oregon Tradeswomen, Inc. and Constructing Hope will likely have a positive impact on promoting diversity in the construction workforce. Targeted funding for these organization's services and programs related to ongoing retention may also be an effective use of funds.

In the Metro study, pre-apprenticeship programs were described as the primary alternative pathway into apprenticeship, particularly for women and people of color (Haines et al. 2018). This report supported promoting direct entry from pre-apprenticeship to apprenticeship (agreements in which pre-apprentice graduates are automatically accepted into certain apprenticeship programs). The data from this report and previous studies (Kelly and Wilkinson 2017b) indicates that pre-apprenticeship programs have been a very effective way to recruit disadvantaged workers, particularly women, into the construction trades. In the current study period, 24% of women of color, 25% of white women, and 4.5% of men of color completed a pre-apprenticeship program prior to enrolling in an apprenticeship in eligible trades (Appendix B). While some of these apprentices may have been able to access an apprenticeship program without the benefit of a pre-apprenticeship program, these figures for diversity among apprentices would certainly look different in the absence of pre-apprenticeship programs. A significant amount of the female participation in apprenticeships can be directly attributed to recruitment into the trades via pre-apprenticeship programs.

Pre-apprenticeship programs Constructing Hope and Oregon Tradeswomen also reach individuals with criminal justice involvement who otherwise might not find a pathway into the trades. We suggest consideration of more recruitment of women and men involved in the criminal justice system, as research suggests that this population fares better after incarceration when entering jobs in the trades, particularly union jobs (Western 2018).

In Oregon, pre-apprenticeship programs and the ongoing support they provide, are concentrated in the Portland Metro area. In order to serve disadvantaged workers across the state, additional sites in other locations in the state are needed.

Improve Efforts to Engage with the Broader Community and with Youth

As noted above, the Metro study found that stakeholders perceived current efforts to recruit apprentices from the broader community (through career fairs and advertising) as not very effective (Haines et al. 2018). The Metro study suggests prioritizing engagement with key community organizations, particularly those serving marginalized workers as well as engaging with youth in K-12 schools and other settings.

The Metro study found that stakeholders in the construction trades feel committed to engaging with K-12 students in order to increase the visibility of the trades as an option (Haines et al 2018). However, efforts were generally not well-coordinated across the metro region and a key recommendation of the study was to develop stronger connections between the construction industry and K-12 (Haines et al 2018). Similarly, an IWRP report (Hegewisch and O'Farrell 2015) notes that schools, career counselors, and job centers need to provide individuals, particularly women, information about the construction trades. Recruiting individuals at younger ages could reduce the number of challenges apprentices face during their apprenticeships (e.g., younger women might be less likely to have young children) and could increase the long-term economic rewards that come from a career in the construction trades. Stigma surrounding construction trades and other blue collar jobs that do not require a four-year college degree reduces the incentive for young adults to pursue a career in the trades, as school counselors, teachers, and parents are less likely to recommend the trades as a first career choice (Rosenbaum 2011; Symonds, Schwartz and Ferguson 2011).

In Oregon, the average age that apprentices began their program was 28 (Appendix B). Perhaps more research could be done to understand why apprentices enter apprenticeships later in adulthood, in their late 20s and 30s. While efforts to reach youth, through vocational training in schools and programs targeted to youth, are important, it will likely still be more effective, in the short run, to target recruitment towards workers in their 20s and 30s who are most likely to begin an apprenticeship.

Promote Respectful Workplaces

As noted in this report, harassment and discrimination on the job are major issues facing apprentices, particularly female and racial/ethnic minority apprentices. Overall, 40% of survey respondents reported experiencing some type of discrimination on the job, with women and people of color the most likely to experience discrimination or harassment (Appendix E). Experiencing harassment and discrimination at work is one reason why apprentices leave their apprenticeship prior to completing. This suggests an industry-wide issue with hostile workplaces that is affecting the retention of apprentices. This issue also impacts a number of other issues that influence workers and employers, such as safety and productivity.

In the 2016 Report of the Co-Chairs of the EEOC Select Task Force on the Study of Harassment in the Workplace, the authors note that harassment is a pervasive and costly problem across occupations (Feldblum and Lipnic 2016). In addition to ongoing losses due to reduced safety, reduced productivity, increased turnover, and damage to employers' reputations, there is the risk of direct costs when employees report harassment. The report noted that in 2015, the EEOC recovered $164.5 million for workers alleging harassment. An IWPR report noted that 33 of the 219 respondents to the 2013 IWPR Tradeswomen Survey reported making a harassment or discrimination claim to the EEOC or Office for Federal Contract Compliance (OFCCP) (Hegewisch and O'Farrell 2015). The EEOC report emphasized that in order to reduce harassment, change in policies and practices must come from leadership at the top with accountability to maintain respectful workplaces for workers throughout the organization. The report notes that training around workplace harassment must be tailored to the workplace. Finally, the report notes that new approaches, such as the bystander intervention approach, may be effective, when paired with a commitment to respectful workplaces that starts with organizational leadership and is consistently enforced throughout the organization. The lessons from the EEOC report should be applied to the construction trades.

Promoting respectful workplaces begins with effective anti-harassment policies (Feldblum and Lipnic 2016; NWLC 2014) and appropriate communication of these policies to employees, through formal statements (such as employee handbooks), training curricula, and front line supervisors' reinforcement of the policies at meetings and in informal conversations (Feldblum and Lipnic 2016; Moir et al. 2011). Advocates suggest that high quality diversity training, tailored to the trades, be provided by apprenticeship programs and employers (Moir et al. 2011). As noted by the EEOC, it is critical that top leadership take the lead on supporting anti-harassment policies and that this position is also supported by middle and front line supervisors. Buy-in for consistent enforcement of these policies will be challenging in the trades, in which supervisors (superintendents, foremen, and journey workers) are sometimes the workers who harass and discriminate on the job site. The EEOC report notes that "zero tolerance" policies are generally not effective as they are not enforceable. Rather, policies should clearly indicate expectations for behavior on the job and consequences for violating the policies. The EEOC report emphasizes complaint, reporting, and investigation procedures (Feldblum and Lipnic 2016); advocates for diversity in the trades agree that this is an important dimension of addressing hostile workplaces (Hegewisch and O'Farrell 2015; NWLC 2014). However, in the construction trades, there is a culture of non-reporting, largely out of fear of retaliation or job loss (Hegewisch and O'Farrell 2015; Kelly and Bassett 2015). Creating respectful workplaces will require reassessment of organizational policies and processes and addressing barriers to making formal complaints. For the trades, additional emphasis should be placed on informal reporting (i.e. verbal rather than written), where appropriate (Kelly and Bassett 2015).

The EEOC report advocates "creating an organizational culture in which harassment is not tolerated" (Feldblum and Lipnic 2016); this is also a goal of advocates for diversity in the trades (Moir et al. 2011; NWLC 2014; PGTI 2016). As noted above, one approach is shifting company policies and practices so that all employees are held accountable for discrimination and harassment. This should include both formal and informal reporting processes. Additionally, some research has suggested possibilities of the effectiveness of bystander intervention approaches, in which bystanders to harassment and discrimination intervene, with a long term goal of shifting the culture of the organization. Research on the application of the bystander intervention model for the construction trades suggests this may be effective if paired with a top-down model of emphasizing respectful workplaces led by organizational leadership and supported

through all levels of the organization (Kelly and Bassett 2015). Oregon is currently piloting the Green Dot bystander program for the construction trades on one job site. Evaluation of this program is currently underway (Kelly and Wilkinson 2017a); the pilot program and evaluation will be completed in 2019.

To ensure enforcement of respectful workplace policies we advocate the creation of a statewide ombudsman tasked with informally evaluating workplaces in the construction trades within Oregon. The ombudsmen would be responsible for promoting and evaluating respectful worksites and for reducing associated opportunity gaps within the construction trades in Oregon. A similar position was created in Washington State to reduce opportunity gaps in public K-12 education. Importantly, the position would be independent of the public system it serves in order to avoid conflicts of interest and to ensure impartiality. A trades ombudsman in Oregon could provide information and training on respectful worksites and conduct evaluations, providing both education and holding worksites accountable. The creation of a state-level ombudsman position would send a strong signal that the state has a serious stake in the creation of respectful worksites.

Ensure Equal Opportunities for Employment during Apprenticeship

Our data demonstrates disparities in accessing on-the-job training hours during apprenticeships. Women report more challenges in being out of work (Appendix E) and are more likely to be unemployed for more than three months out of the last year (Appendix G). Our data also suggests that the inability to access consistent work is a reason why some apprentices terminate their apprenticeship programs. Previous research has also noted that the lack of work for women and people of color is part of a larger system of disadvantage that leads to lower retention rates (Kelly et al. 2015).

One approach to addressing this issue is increased monitoring of on-the-job hours for apprentices, in which apprenticeship programs, unions, and/or employers evaluate their policies and practices for assigning work to ensure they are fair as well as undertake internal audits to ensure that their racial/ethnic minority and female apprentices are accruing on-the-job hours at the same rate as white men (Moir et al. 2011; NWLC 2014; PGTI 2016). This requires acknowledging that some policies that are, on the surface, gender and race/ethnicity neutral (such as the out of work list) actually perpetuate gender and racial/ethnic inequality in practice (Kelly et al. 2015).

Another approach supported by many advocates for diversity in the construction workforce is the use of contract goals (Moir et al. 2011; NWLC 2014; PGTI 2016). This approach is currently being used for some construction projects in Oregon. Requiring contractors to allocate more hours to female and racial/ethnic minority workers may help to counteract the currently unequal access to jobs. However, researchers and advocates have noted that some women experience being moved from job to job to meet compliance goals; also, having gender and race/ethnicity based goals tend to primarily benefit apprentices rather than journey workers (Moir et al. 2011; NWCL 2014). These practices must be monitored so as not to undermine the goal of increasing employment of disadvantaged workers.

Improve Quality of On-the-Job Training during Apprenticeship

Our data, along with previous research, suggests that female and racial/ethnic minority workers often do not have access to mentors or people who will teach them skills of their trade; women and people of color are more likely to report doing low skill tasks, such as cleaning and sweeping. In order for female and

racial/ethnic minority apprentices to be successful in the trades in the long term, they must receive high quality on-the-job training during their apprenticeship.

Efforts must be made by employers to pair apprentices with skilled journey workers who are willing to teach them. Employers must ensure that journey workers view training apprentices as part of their work responsibilities. Some apprentice programs and employers adopt practices of rotating apprentices within and between job sites to ensure apprentices have access to a range of journey workers to teach them as well as opportunities to learn the variety of skills in their trade. This can be a useful practice for improving the quality of on-the-job training. However, given that joining a new work crew can be more challenging for women and racial/ethnic minority apprentices than white male apprentices, efforts must be made to ensure that they are not disadvantaged by rotation practices.

Some apprenticeship programs include a course on transitioning from apprentice to journey worker, emphasizing how to teach and mentor on the job site. This could be a required component of apprenticeship programs in Oregon.

Continue Financial Supportive Services; Expand Non-Financial Supportive Services

Funding for programs to increase recruitment and retention is a critical component of increasing the diversity of the construction workforce (Hegewisch and O'Farrell 2015). Oregon's efforts are often used as an example of how to effectively use public funds to increase the diversity of the construction workforce (e.g., Hegewisch et al. 2014).

As noted in this report, receiving financial supportive services (i.e. fuel, tools and clothing, childcare, travel) positively impacts the likelihood of completing an apprenticeship (Figure 2). The helpfulness of specific services vary by race-gender groups (Figure 2): overall our data shows that childcare assistance has the largest association with completion, yet this association is being driven by white men. Among other race-gender groups, assistance with tools/PPE, fuel, and travel assistance have the largest association with completion. As noted in the report, support for childcare is helpful to many parents; however, for parents, particularly single parents, both affording and finding consistent childcare (including care for children on weekends and evenings) can pose significant challenges. Apprentices receiving two or more services are most likely to identify assistance with tools/PPE as the most helpful support (Appendix D), and a large majority of those receiving financial assistance are receiving assistance purchasing tools/PPE (Appendix B). Providing assistance with tools/PPE appears to be a cost effective way to increase retention of apprentices, particularly those struggling financially.

Our data also assessed the effect of non-financial services, including counseling, mentoring, or social support, as provided by Cooper Zeitz, Akana, Oregon and Southern Idaho Laborers, Oregon Tradeswomen Inc., and Constructing Hope. Our data shows that the effect of non-financial services is larger than the effect of financial services for all race-gender groups except white men (Figure 2). In the current study period, only 1.4% of apprentices in eligible trades received non-financial services, compared to 24.6% receiving financial services (Appendix B). The percentage of apprentices in eligible trades receiving non-financial services is actually down from the last reporting period. Given the effectiveness of these services, increasing funding for these programs would likely have an impact on retention.

Continue Efforts to Promote Awareness of ODOT/BOLI Supportive Services

As noted above, awareness of ODOT/BOLI supportive services increased between the 2013 and 2015 surveys. In the most recent survey, 46.4% of apprentices in eligible trades were aware of the program (Appendix G). Thus, ongoing efforts to make apprentices aware of the services are needed. Apprentices should learn about the ODOT/BOLI supportive services through their apprenticeship classes as well as through job sites (particularly bridge and road projects that make all apprentices on those sites eligible for services).

METHODS NOTES

Oregon Apprenticeship System (OAS) Data

Data from the Oregon Apprenticeship System (OAS) database of current and past apprentices was used for this study. For trend analysis of enrollment and completion rates between 2005 and 2017 (Appendix A), all apprentices in the 2005-2017 cohorts who did not cancel with zero credit hours accumulated were included (N=18405). For analysis of completion rates by receipt of ODOT-BOLI support services (Figure 1), all apprentices in the 2005-2017 cohorts in eligible trades who had completed or terminated by 2017 and who did not cancel with zero credit hours accumulated were included (N=4315).

For analyses of apprentices in the current reporting period (Appendix B), apprentices in the 2005-2017 cohorts active between January 1, 2016 and December 31, 2017 who did not cancel with zero credit hours accumulated were included. This included 8737 individual apprentices, including 646 (7.4%) women, 8091 (92.6%) men, 158 (1.8%) women of color, 490 (5.6%) white women, 1789 (20.5%) men of color, and 6312 (72.2%) white men. 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.

Results from the previous reporting periods (Burds-Sharp, Lewis, & Kelly 2014; Wilkinson & Kelly 2016) were based on a) OAS data that covered the 2005 to 2013 cohorts of apprentices in highway construction trades who were active between March 1, 2011 and January 31, 2014 and who did not cancel with zero credit hours accumulated (including 97 apprenticeship agreements initiated in the first month of 2014) and b) OAS data covering 2005 to 2015 cohorts of apprentices in highway construction trades active between January 1, 2014 and December 31, 2015 who did not cancel with zero credit hours accumulated. In the 2014 report, for apprentices with multiple agreements, only the most recent agreement was used. In the 2016 report, agreements were aggregated to the individual level.

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.

Telephone Survey

Complimenting OAS data, we collected interview data from a phone survey conducted between March 20th and March 29th, 2018 to assess the effectiveness of ODOT-BOLI support services and continued challenges faced by apprentices in the highway construction trades. Similar to the 2014 and 2016 phone surveys, the 2018 survey was conducted by the Portland State University Survey Research Lab. The survey reached 506 current and past apprentices of the 2005-2017 cohorts who were active between January 1, 2016 and December 31, 2017.

The 2018 survey had a response rate of 52 percent, and the average interview took 14.7 minutes to complete. The sample was stratified by receipt of ODOT-BOLI supportive services, gender, race/ethnicity, and status, with an oversample of women and people of color and those receiving supportive services. Sample size and sample characteristics of the 2014, 2016, and 2018 surveys are quite similar on variables such as completion, gender, race/ethnicity, age, parental status, and education. The survey included respondents who did (38%) and did not receive ODOT-BOLI services, so that challenges facing non-service recipients could be analyzed with the survey data as well. Women and people of color were oversampled to ensure there would be a sufficient number of responses from individuals in these groups to permit analysis of the results by gender and by race/ethnicity. As a result, 184 (36.4%) survey respondents were men of color, 96 (19 %) where white men, 181 (35.8%) were white women, and 45 (8.9%) were women of color. Apprentices were considered eligible for ODOT-BOLI supportive services if they reported working on a bridge or highway project or if their trade was carpenter, cement mason, ironworker, laborer, operating engineer, or painter.

Characteristics of Apprentices Surveyed in 2014, 2016, and 2018

	2014 Survey	2016 Survey	2018 Survey
% Currently enrolled/completed/ left without completing	67%/19%/14%	68%/18%/14%	63%/24%/13%
% Male/Female	75%/25%	79%/21%	55%/45%
% White/People of Color	48%/52%	45%/55%	56%/44%
Average age entering apprenticeship	30	29	30
% Living with partner	53%	70%	56%
% With at least one child under age 18	51%	48%	41%
% With at least one child under 5	30%	31%	23%
% Completed high school or GED/ a year or more of college/ a year or more of trade school	88%/43%/16%	95%/42%/14%	93%/49%/17%
% Received BOLI supportive services	n/a	19%	38%
Sample Size	519	523	506

Note on Race and Ethnicity

In the OAS data, race and ethnicity data are collected through the Apprenticeship Registration Agreement form on which apprentices are prompted to report their race and ethnicity by checking one box under the abbreviations “WH,” “BL,” “AI,” “AS,” or “HI”. Survey respondents could identify their race as white,

Black or African American, Native American or Alaska Native, Asian American, Native Hawaiian or Other Pacific Islander, or any combination of these. Respondents were asked to identify their ethnicity as either Hispanic or Latino, or not Hispanic or Latino. Tabulations from OAS data use race and ethnicity data as they appear in the OAS and tabulations from survey responses use race and ethnicity data as they appear in that source. Throughout this report, we use "people of color" to refer to anyone who self-identifies with a race and ethnicity combination other than non-Hispanic white.

Note on the Performance Measurement System (Appendix G)

The following notes provide additional details on the definitions of the indicators included in the Performance Measurement System:

1. Data were obtained from Oregon Tradeswomen, Inc. and Constructing Hope pre-apprenticeship program administrators.

2. The percentage of apprentices in eligible trades (carpenter, cement mason, ironworker, laborer, operating engineer, or painter) active between January 1, 2016 and December 31, 2017 (N=2624) who completed a pre-apprenticeship as reported by BOLI (OAS data).

3. Race/ethnicity and gender of apprentices comes from the apprenticeship agreement form; data is from all apprentices who began apprenticeship agreements in 2016 or 2017 and did not cancel with 0 credit hours (N=4766).

4. The percentage of apprentices in eligible trades (carpenter, cement mason, ironworker, laborer, operating engineer, or painter) active between January 1, 2016 and December 31, 2017 (N=8737) who received one or more financial support services from ODOT-BOLI.

5. The percentage of apprentices in eligible trades (carpenter, cement mason, ironworker, laborer, operating engineer, or painter) active between January 1, 2016 and December 31, 2017 (N=2040) who received ODOT-BOLI non-financial supportive services (e.g., mentoring).

6. The percentage of survey respondents who indicated they had worked on a bridge or highway project and/or who worked in an eligible trade who were aware that ODOT-BOLI supportive services existed. Survey question about awareness of ODOT-BOLI supportive services was only asked of apprentices who indicated that they had not received them (n=260).

7. The percentage of all survey respondents who indicated that they experienced any form of discrimination due to race/ethnicity or gender or sexual harassment on the job either "sometimes" or "often" (n=506).

8. The percentage of all survey respondents indicating they experienced discrimination due to being an apprentice (n=506)

9. The percentage of apprentices completing an apprenticeship by 2017 as a percentage of apprentices active in the current reporting period (January 1, 2016 and December 31, 2017) (N=2782) (i.e., excluding those who were active, moved, or deceased).

10. The percentage of survey respondents who had completed or terminated their apprenticeship agreement (n=186) who were working as journey workers at the time of the survey.

11. The percentage of survey respondents reporting they have been out of work for more than three months in the past year (n=506).

APPENDICES

Appendix A. Enrollment and Completion by Gender and Race (OAS Data), 2005-2017 Cohorts							
Measures	**Total**	**Men**	**Women**	**White Men**	**Men of Color**	**White Women**	**Women of Color**
Percentage distribution of apprentices, 2005 cohort (N=1847)	100	94.6	5.4	81.2	13.5	3.8	1.5
Percentage distribution of apprentices, 2006 cohort (N=1888)	100	93.7	6.3	79.7	14.0	5.3	1.0
Percentage distribution of apprentices, 2007 cohort (N=1914)	100	93.6	6.4	77.6	16.0	4.8	1.5
Percentage distribution of apprentices, 2008 cohort (N=1170)	100	93.8	6.2	76.4	17.4	4.6	1.6
Percentage distribution of apprentices, 2009 cohort (N=462)	100	89.4	10.6	69.5	19.9	5.8	4.8
Percentage distribution of apprentices, 2010 cohort (N=570)	100	93.7	6.3	73.3	20.4	5.3	1.1
Percentage distribution of apprentices, 2011 cohort (N=959)	100	92.3	7.7	76.5	15.7	6.2	1.6
Percentage distribution of apprentices, 2012 cohort (N=966)	100	91.3	8.7	74.8	16.5	7.2	1.4
Percentage distribution of apprentices, 2013 cohort (N=1584)	100	92.3	7.7	73.1	19.2	6.2	1.5
Percentage distribution of apprentices, 2014 cohort (N=1600)	100	93.7	6.3	73.2	20.5	4.4	1.9
Percentage distribution of apprentices, 2015 cohort (N=1592)	100	92.1	7.9	70.0	22.0	5.7	2.2
Percentage distribution of apprentices, 2016 cohort (N=2259)	100	92.5	7.5	70.9	21.6	6.0	1.6
Percentage distribution of apprentices, 2017 cohort (N=2507)	100	92.1	7.9	69.4	22.9	5.6	2.4
Six-year completion rate, 2005 cohort (N=1847)	58.1	59.2	38.4	60.8	49.6	42.3	28.6
Six-year completion rate, 2006 cohort (N=1888)	53	55.5	40	55.5	44.9	40.0	36.8
Six-year completion rate, 2007 cohort (N=1914)	48.4	49.16	37.7	51.0	40.2	42.4	24.1
Six-year completion rate, 2008 cohort (N=1170)	49.9	50.05	48	52.9	37.4	50.0	42.1
Six-year completion rate, 2009 cohort (N=462)	49.6	52.1	28.6	57.3	33.7	37.0	18.2
Six-year completion rate, 2010 cohort (N=570)	53.8	55.2	33.3	55.6	53.5	36.7	16.7
Six-year completion rate, 2011 cohort (N=959)	60.4	61.3	49.3	63.1	53	47.5	57.1
Source: OAS Data; includes all apprentices in 2005-2017 cohorts who did not cancel with zero credit hours							

Appendix B. Apprentice Trade, Demographics, Status, and Use of ODOT-BOLI Services by Gender and Race (OAS Data)

Measures	Total	Men	Women	White Men	Men of Color	White Women	Women of Color
Bricklayer (%)	0.7	0.8	0.5	0.7	0.8	0.6	0.0
Carpenter (%)	15.9	15.1	26.2	12.5	24.4	24.1	32.9
Cement mason (%)	1.6	1.6	1.6	1.4	2.6	1.6	1.3
Electrician (%)	37.8	38.3	31.0	42.5	23.5	34.5	19.6
Ironworker (%)	3.5	3.6	2.3	3.3	4.5	2.7	1.3
Laborer (%)	5.8	5.5	9.4	4.2	10.2	7.6	15.8
Operating engineer or equipment operator (%)	1.9	1.8	3.1	1.9	1.5	3.5	1.9
Painter (%)	1.6	1.5	2.8	1.4	2.2	2.7	3.2
Plumber (%)	12.8	13.4	4.6	14.8	8.3	5.3	2.5
Sheet metal worker (%)	6.6	6.7	4.5	7.4	4.2	5.3	2.5
Other trade (%)	13.2	12.9	16.9	11.0	20.0	15.1	23.4
Eligible trade (%)	30	28.8	44.4	24.1	43.9	41.5	54.4
Average age at indenture	28.1	27.9	31.1	27.7	28.4	31.0	31.7
Completed some college (%)	40.5	39.2	57.1	40.5	35	58.4	53.8
Completed some vocational school (%)	13.4	12.9	18.7	13.2	12.1	17.6	23.4
Status Active (%)	68.1	68.2	66.3	68.4	67.8	65.1	69.6
Status Completed (%)	16.7	16.9	14.7	18.0	12.9	14.9	14.6
Status Terminated (%)	15.1	14.8	19.0	13.7	18.9	19.8	16.5
Status Completed (% among those completed or terminated)	52.5	53.2	43.6	56.8	40.6	42.9	46.9
Completed (% among those completed in 2016/17)	100	93.4	6.6	77.7	15.7	5.0	1.6
N	8737	8091	646	6312	1789	490	158
Source: OAS data; includes all apprentices in 2005-2017 cohorts active in 2016-17 who did not cancel with zero credit hours accumulated							
Completed a pre-apprenticeship (% in eligible trades)	4.7	2.2	24.5	1.2	4.5	25.1	23.5
Received non-financial support services (% in eligible trades)	1.4	0.5	9.1	0.3	0.8	8.7	9.9
Received one or more BOLI-ODOT financial support services (% in eligible trades)	24.6	21.8	46.4	18.8	26.9	41.5	58.0
Received per diem support (% in eligible trades)	4.2	4.1	5.5	4.4	3.4	4.6	7.4
Received fuel support (% in eligible trades)	7.2	6.9	9.1	6.3	7.6	7.2	13.6
Received child care support (% in eligible trades)	2.1	1.7	4.7	1.4	2.2	4.1	6.2
Received tools/PPE support (% in eligible trades)	21.8	19.1	42.7	16.2	24.0	38.5	53.1
N	2624	2332	274	1480	762	195	81
Source: OAS data; includes apprentices in 2005-2017 cohorts active in 2016-17 in eligible trades who did not cancel with zero credit hours accumulated							

Appendix B, Cont. Apprentice Trade, Demographics, Status, and Use of ODOT-BOLI Services by Gender and Race (OAS Data)							
Measures	**Total**	**Men**	**Women**	**White Men**	**Men of Color**	**White Women**	**Women of Color**
Service recipients with per diem support (% w/ financial support)	15.7	17.5	9.2	21.5	11.5	8.6	10.2
Service recipients with fuel support (% w/ financial support)	26.6	29.1	16.6	31.0	25.2	15.2	18.6
Service recipients with child care support (% w/ financial support)	9.5	9.3	10.4	9.2	8.8	9.5	11.9
Service recipients with support for tools/PPE (% w/ financial support)	90.2	89.1	93.9	87.4	91.2	94.3	93.2
N	760	597	163	381	262	105	59
Source: OAS data; includes all apprentices in 2005-2017 cohorts active in 2016-17 who did not cancel with zero credit hours accumulated and who received ODOT-BOLI financial services							

Appendix C. Apprentice Trade, Demographics, Status, and Use of ODOT-BOLI Services by Gender and Race (2018 Survey Data)							
Measure	**Total**	**Men**	**Women**	**White Men**	**Men of Color**	**White Women**	**Women of Color**
Bricklayer (%)	0.8	1.1	0.4	0.0	1.6	0.6	0.0
Carpenter (%)	25.9	26.8	24.8	24.0	28.3	24.3	26.7
Cement mason (%)	1.8	3.2	0.0	1.0	4.4	0	0.0
Electrician (%)	28.7	21.4	37.6	24.0	20.1	40.3	26.7
Ironworker (%)	2.6	2.9	2.2	2.1	3.3	1.7	4.4
Laborer (%)	9.9	12.5	6.6	14.6	11.4	5.5	11.1
Operating engineer or equipment operator (%)	3.0	2.9	3.1	5.2	1.6	3.9	0.0
Painter (%)	2.8	3.6	1.8	4.2	3.3	1.7	2.2
Plumber (%)	5.3	6.1	4.4	8.3	4.9	5	2.2
Sheet metal worker (%)	4.6	4.6	4.4	3.1	5.4	4.4	4.4
Other trade (%)	14.8	15	14.6	13.5	15.8	12.7	22.2
Eligible trade (%)	44.9	49.6	38.9	50.0	49.5	37.6	44.4
Work on a highway or bridge project during apprenticeship (%)	17	17	19	18	16	16	29
Average age at indenture	29.8	28.7	31.1	28.4	28.8	31.6	29.3
Completed some college (%)	49.2	40	60.6	34.4	42.9	60.8	60.0
Completed some vocational school (%)	17.0	16.8	17.3	19.8	15.2	17.1	17.8
Individual income as % of 2016 FPL							
0-100%	7.3	5.2	9.9	3.4	6.1	8.5	15.4
101-225%	13.9	13.1	14.8	15.7	11.7	13.4	20.5
226-280%	17.6	14.3	21.7	10.1	16.6	23.2	15.4
281-335%	21.1	21.4	20.7	15.7	24.5	22.6	12.8
> 335%	40.2	46.0	33.0	55.1	41.1	32.3	35.9
Household income as % of 2016 FPL							
0-100%	6.4	5.7	7.3	3.4	7.0	5.5	14.6
101-225%	25.9	26.4	25.4	28.1	25.5	28.1	14.6
226-280%	16.6	14.2	19.5	12.4	15.3	17.1	29.3
281-335%	15.3	18.3	11.7	18.0	18.5	12.2	9.8
> 335%	35.7	35.4	36.1	38.2	33.8	37.2	31.7
Received unemployment benefits (%)	48.9	47.5	50.7	57.3	42.4	52.2	44.4
Received public assistance (%)	9.3	7.5	11.6	4.2	9.2	11.7	11.1
Months out of work (mean)	1.3	1.0	1.7	1.1	1.0	1.6	2.1
Struggled to make ends meet							
Never	36.1	39.6	31.9	31.3	44.0	33.2	26.7
Rarely	27.6	27	28.3	27.1	26.9	26	37.8
Sometimes	21.8	21.6	22.1	28.1	18.1	22.7	20.0
Often	9.3	9	9.7	9.4	8.8	9.9	8.9
Always	5.2	2.9	8.0	4.2	2.2	8.3	6.7

Appendix C, Cont. Apprentice Trade, Demographics, Status, and Use of ODOT-BOLI Services by Gender and Race (2018 Survey Data)							
Measure	**Total**	**Men**	**Women**	**White Men**	**Men of Color**	**White Women**	**Women of Color**
Household size (mean)	3.0	3.2	2.7	2.9	3.3	2.6	2.9
Lived with spouse/partner (%)	55.5	59.6	50.4	58.3	60.3	53.0	40.0
One or more children under 18 (%)	41.1	43.9	37.6	41.7	45.1	38.1	35.6
Spouse/partner works (% among those living with spouse/partner)	37.5	39.2	35.1	28.6	44.6	34.4	38.9
Spouse/partner works full time (% among those living with spouse/partner)	27.9	27.7	28.1	14.3	34.6	28.1	27.8
Number of children under 18 (mean for those with children)	2.0	2.0	2.0	2.0	2.0	2.0	1.8
One or more children under 5 (% among those w/children)	56.3	66.7	41.2	72.5	63.9	39.1	50.0
Apprenticeship Status (%)							
Active	63.2	59.3	68.1	49.0	64.7	69.6	62.2
Completed	23.5	28.6	17.3	42.7	21.1	16.6	20.0
Terminated	13.2	12.1	14.6	8.3	14.1	13.8	17.8
Child care arrangements (% among those needing child care)							
Spouse or partner	34.6	46.3	17.7	55.0	42.2	18.8	12.5
Unpaid friend or family member	18.3	18.7	17.7	17.5	19.3	17.4	18.8
Paid child care provider	25.0	21.1	30.6	15.0	24.1	27.5	43.8
Children old enough to take care of selves	15.9	7.3	28.2	7.5	7.2	31.9	12.5
Other arrangements	6.3	6.5	5.9	5.0	7.2	4.4	12.5
Sexual Identity							
Straight	87.2	99.3	71.8	99.0	99.5	71.8	72.1
GLB	11.5	0.4	25.5	1.0	0	26	23.3
Other	1.4	0.4	2.7	0.0	0.5	2.3	4.7
N	506	280	226	96	184	181	45
Source: 2018 Survey Data							

Appendix D. Apprenticeship Experience with Supportive Services by Gender and Race (2018 Survey Data)							
Measure	**Total**	**Men**	**Women**	**White Men**	**Men of Color**	**White Women**	**Women of Color**
Received one or more BOLI-ODOT financial services (% in eligible trades)	57.8	64.0	47.5	83.6	53.8	46.1	52.2
Received per diem support (% in eligible trades)	8.9	11.8	4.0	29.1	2.8	5.3	0.0
Received fuel support (% in eligible trades)	12.7	15.5	8.1	23.6	11.3	7.9	8.7
Received child care support (% in eligible trades)	3.5	4.4	2.0	3.6	4.7	2.6	0.0
Service recipients with support for tools/PPE (%)	53.5	57.1	47.5	70.9	50.0	46.1	52.2
Received social support services (%)	5.0	1.2	11.1	1.8	0.9	9.2	17.4
Completed a pre-apprenticeship (%)	15.0	7.5	27.3	3.6	9.4	26.3	30.4
Agree pre-apprenticeship taught skills needed to begin apprenticeship (n=40)	89.5	100.0	89.3	100.0	100.0	90.5	85.7
Agree child care support allowed them to work additional hours (n=9)	75.0	71.4	100.0	0.0	83.3	100.0	x
Agree BOLI-ODOT support services allowed them to take jobs they would otherwise would not have	67.3	67.3	67.2	63.8	69.8	61.7	85.7
Agree could not have completed apprenticeship without support services	11.1	10.0	12.4	8.3	10.9	12.7	11.1
Which supportive service was most helpful (% among those receiving more than one; n=61)							
Gas	16.7	20.8	11.1	23.1	18.2	16.7	0.0
Travel	11.9	12.5	11.1	23.1	0.0	16.7	0.0
Child care	19.1	29.2	5.6	7.7	54.6	8.3	0.0
Tools	45.2	37.5	55.6	46.2	27.3	41.7	83.3
Non-Financial	7.1	0.0	16.7	0.0	0.0	16.7	16.7
Heard of Green Dot	10.5	10.6	10.2	5.6	13.2	10.7	8.7
Aware of services (% among eligible not receiving services; n=87)	55.2	47.8	63.4	40.0	48.8	65.6	55.6
If aware, would you have applied? (% among eligible not receiving and not aware; n=39)	84.8	90.7	78.4	90.6	90.8	77.7	82.4
N	260	161	99	55	106	76	23
Source: 2018 Survey Data, includes 2018 survey respondents in eligible trades or who worked on bridge/highway project							

Appendix E. Challenges Facing Apprentices by Gender and Race (2018 Survey Data)							
Measure	**Total**	**Men**	**Women**	**White Men**	**Men of Color**	**White Women**	**Women of Color**
Identified each as major/minor problem (%)							
Cost of childcare (among those w/ children)	33.5	26.0	44.6	27.5	25.3	42.7	53.3
Finding consistent child care (among those w/ children)	29.0	21.1	40.5	15.0	24.1	39.1	46.7
Being out of work too much	29.9	25.7	35.1	26.0	25.5	32.8	44.4
Performing low-skill tasks	35.8	28.0	45.6	26.0	29.0	43.1	55.6
Lack of mentoring	36.0	28.6	45.1	30.2	27.7	44.8	46.7
Finding reliable transportation	14.8	15.0	14.6	15.6	14.7	15.5	11.1
Paying for gas	29.1	29.4	28.8	21.9	33.3	29.3	26.7
Paying for food and lodging	20.5	17.1	25.7	14.5	18.6	24.1	32.1
Buying tools and equipment	36.2	32.5	40.9	26.0	35.9	40.0	44.4
Experienced any discrimination on the job	40.3	27.5	56.3	18.8	32.1	54.2	64.4
Experienced apprentice discrimination	22.8	14.6	33.0	8.3	17.9	30.2	44.4
Experienced racial discrimination	12.5	16.1	8.0	5.2	21.7	3.9	24.4
Experienced gender discrimination	25.6	2.9	54.0	5.2	1.6	52.5	60.0
Experienced race or gender discrimination	41.7	20.8	67.7	12.6	25.0	66.9	71.1
Experienced age discrimination	13.7	8.9	19.6	6.3	10.3	19.6	20.0
Experienced sexual orientation discrimination	6.8	1.4	13.4	1.0	1.6	11.2	22.2
Experienced unwanted sexual attention or sexual comments	26.1	6.4	50.7	7.3	6.0	50.6	51.1
Witnessed other workers experience discrimination	44.6	37.3	53.8	40.6	35.5	51.1	64.4
Witnessed others experience apprentice discrimination	24.0	19.0	30.2	21.9	17.5	25.6	48.9
Witnessed others experience racial discrimination	22.2	16.9	28.9	15.6	17.5	26.7	37.8
Witnessed others experience gender discrimination	24.0	14.3	36.0	17.7	12.6	33.9	44.4
Witnessed others experience age discrimination	16.7	12.2	22.2	14.6	10.9	20.6	28.9
Witnessed others experience sexual orientation discrimination	11.9	7.9	16.9	7.3	8.2	14.4	26.7
Financial situation after becoming apprentice							
Better	86.6	88.1	84.8	89.5	87.4	83.3	90.9
Worse	8.0	6.1	10.3	5.3	6.6	11.1	6.8
About the Same	5.4	5.8	4.9	5.3	6.0	5.6	2.3
Heard of Green Dot	9.5	6.8	13.0	3.2	8.7	13.4	11.1
N	506	280	226	96	184	181	45
Source: 2018 Survey							

Appendix F. Experiences After Apprenticeship by Gender and Race (2018 survey data)							
	Total	**Men**	**Women**	**White Men**	**Men of Color**	**White Women**	**Women of Color**
Working as journey worker (%)							
Among completed	82.2	83.5	79.5	87.5	79.5	83.3	66.7
Working in construction but not as journeyworker (%)							
Among completed	10.2	10.1	10.3	7.5	12.8	10.0	11.1
Among terminated	22.7	24.2	21.2	28.6	23.1	16.0	37.5
Working in non-construction job (%)							
Among completed	1.0	1.3	0.0	0.0	2.6	0.0	0.0
Among terminated	54.6	57.6	51.5	71.4	53.9	52.0	50.0
Unemployed							
(% of completed)	6.8	5.1	10.3	5.0	5.1	6.7	22.2
(% of terminated)	19.7	12.1	27.3	0.0	15.4	32.0	12.5
Received unemployment benefits							
Among completed	31.1	31.3	30.8	39.0	23.1	30.0	33.3
Among terminated	11.9	14.7	9.1	12.5	15.4	12.0	0.0
Received public assistance							
(% of completed)	2.5	0.0	7.7	0.0	0.0	0.0	33.3
(% of terminated)	17.9	26.5	9.1	37.5	23.1	8.0	12.5
Struggled to make ends meet (among completed)							
Never	61.3	58.8	66.7	53.7	64.1	66.7	66.7
Rarely	21.0	20.0	23.1	17.1	23.1	26.7	11.1
Sometimes	11.8	16.3	2.6	22.0	10.3	3.3	0.0
Often	3.4	2.5	5.1	4.9	0.0	3.3	11.1
Always	2.5	2.5	2.6	2.4	2.6	0.0	11.1
Struggled to make ends meet (among terminated)							
Never	43.3	47.1	39.4	12.5	57.7	36.0	50.0
Rarely	20.9	26.5	15.2	37.5	23.1	16.0	12.5
Sometimes	19.4	23.5	15.2	50.0	15.4	16.0	12.5
Often	10.5	2.9	18.2	0.0	3.9	20.0	12.5
Always	6.0	0.0	12.1	0.0	0.0	12.0	12.5
Months out of work (mean)							
Among completed	0.8	0.6	1.2	0.8	0.4	0.5	4.0
Among terminated	1.7	1.5	1.9	3.2	1.2	1.9	2.0
Working as journey worker or in construction (%)							
Among completed	92.9	95.7	86.7	97.2	93.9	91.7	66.7
Among terminated	23.0	25.0	20.7	33.3	23.1	17.4	33.3

Appendix F., cont. Experiences After Apprenticeship by Gender and Race (2018 survey data)							
	Total	**Men**	**Women**	**White Men**	**Men of Color**	**White Women**	**Women of Color**
Reason for terminating (%)							
Chose to leave	88.1	91.2	84.9	100.0	88.5	80.0	100.0
Asked to leave	6.0	2.9	9.1	0.0	3.9	12.0	0.0
Individual income after apprenticeship as % of 2016 FPL (among completed)							
0-100%	2.7	1.3	5.3	2.4	0.0	0.0	25.0
101-225%	0.9	0.0	2.6	0.0	0.0	0.0	12.5
226-280%	6.0	7.6	2.6	12.2	2.6	3.3	0.0
281-335%	6.8	7.6	5.3	7.3	7.9	6.7	0.0
> 335%	83.8	83.5	84.2	78.1	89.5	90.0	62.5
Individual income after apprenticeship as % of 2016 FPL (among terminated)							
0-100%	21.1	15.2	27.3	12.5	16.0	36.0	0.0
101-225%	27.3	30.3	24.2	62.5	20.0	20.0	37.5
226-280%	19.7	18.2	21.2	12.5	20.0	28.0	0.0
281-335%	15.2	21.2	9.1	0.0	28.0	8.0	12.5
> 335%	16.7	15.2	18.2	12.5	16.0	8.0	50.0
Household income after apprenticeship as % of 2016 FPL (among completed)							
0-100%	2.7	1.3	5.4	2.5	0.0	0.0	22.2
101-225%	12.5	17.3	2.7	17.5	17.1	0.0	11.1
226-280%	9.8	9.3	10.8	12.5	5.7	14.3	0.0
281-335%	12.5	12.0	13.5	12.5	11.4	17.9	0.0
> 335%	62.5	60.0	67.6	55.0	65.7	67.9	66.7
Household income after apprenticeship as % of 2016 FPL (among terminated)							
0-100%	12.1	14.3	10.0	0.0	18.2	13.0	0.0
101-225%	36.2	50.0	23.3	83.3	40.9	26.1	14.3
226-280%	15.5	3.6	26.7	0.0	4.6	21.7	42.9
281-335%	8.6	10.7	6.7	0.0	13.6	8.7	0.0
> 335%	27.6	21.4	33.3	16.7	22.7	30.4	42.9
N	186	114	72	49	119	126	28

Source: 2018 Survey Data; Sample includes all survey respondents who reported completing or terminating their most recent apprenticeship; this includes 119 who completed and 67 who left without completing (cancelled or terminated)

Appendix G. Performance Measurement System

No	Indicator	Source	TOTAL	White Men	White Women	Men of Color	Women of Color
1	Number completing pre-apprenticeship programs	Pre-apprenticeship program administrators	286	40	122	74	50
2	Percentage of active apprentices working in eligible trades completing pre-apprenticeship program	OAS data	5	1	24	4.2	25
3	Percentage distribution of newest cohort of apprentices in the heavy highway trades [2016-2017 cohorts]	OAS data	100	70	6	22	2
4	Percentage of active apprentices working in eligible trades who receive BOLI financial supportive services	OAS data	24	19	42	26	57
5	Percentage of active apprentices working in eligible trades who received BOLI mentoring services	OAS data	2	<1	9	<1	11
6	Percentage of survey respondents in eligible trades aware that BOLI supportive services exist	Apprentice survey data	55	40	66	49	56
7	Percentage of survey respondents who report experiencing gender/race discrimination or sexual harassment	Apprentice survey data	42	13	67	25	71
8	Percentage of survey respondents who report experiencing discrimination due to apprenticeship status	Apprentice survey data	24	22	26	18	49
9	Completion rate among those completed or terminated	OAS data	52	57	43	41	47
10	Percentage of respondents who completed their apprenticeship who are now journeyworkers	Apprentice survey data	82	88	83	80	67
11	Percentage of apprentices reporting that they were out of work for more than three months in the past year	Apprentice survey data	14	9	19	7	27

Appendix H. ODOT/BOLI Highway Construction Workforce Development Program - Key Performance Measures					
Policy Goal/Key Performance Measure	Previous Reporting Period	Current Reporting Period	Goal	Goal Met (within 2%)	Progress Made
Outreach and Recruitment - Registering a More Diverse Cohort of Apprentices in the Highway Construction Trades					
% newest cohorts of apprentices in the highway construction trades (white women)	5.0%	5.8%	≥ 8.0%		✓
% newest cohorts of apprentices in the highway construction trades (women of color)	2.1%	2.1%	≥ 2.0%	✓	✓
% newest cohorts of apprentices in the highway construction trades (men of color)	21.5%	22.3%	≥ 20.6%	✓	✓
Supportive Services - Awareness and Use of Supportive Services					
% survey respondents in eligible trades who are aware that ODOT-BOLI supportive services exist (white women)	52.0%	68.6%	≥ 50.0%	✓	✓
% survey respondents in eligible trades who are aware that ODOT-BOLI supportive services exist (men of color)	44.4%	54.4%	≥ 50.0%	✓	✓
% survey respondents in eligible trades who are aware that ODOT-BOLI supportive services exist (women of color)	33.3%	55.6%	≥ 50.0%	✓	✓
% active apprentices working in eligible trades who receive ODOT-BOLI financial supportive services (white women)	26.9%	41.5%	≥ 25.0%	✓	✓
% active apprentices working in eligible trades who receive ODOT-BOLI financial supportive services (men of color)	21.0%	26.3%	≥ 25.0%	✓	✓
% active apprentices working in eligible trades who receive ODOT-BOLI financial supportive services (women of color)	52.2%	57.1%	≥ 50.0%	✓	✓
% active apprentices in eligible trades receiving mentoring services (white women)	5.5%	8.5%	≥ 30.0%		✓
% active apprentices in eligible trades receiving mentoring services (men of color)	2.0%	0.8%	≥ 30.0%		✗
% active apprentices in eligible trades receiving mentoring services (women of color)	4.3%	10.7%	≥ 30.0%		✓
Workplace Culture - Experience of Discrimination or Harassment					
% survey respondents who report experiencing discrimination or harassment due to race or gender (white women)	69.0%	66.9%	≤ 17.1%		✓
% survey respondents who report experiencing discrimination or harassment due to race or gender (men of color)	30.7%	25.0%	≤ 17.1%		✓
% survey respondents who report experiencing discrimination or harassment due to race or gender (women of color)	70.8%	71.1%	≤ 17.1%		✗
% survey respondents who report experiencing any type of discrimination or harassment (white women)	80.0%	81.2%	≤ 50%		✗

Appendix H, cont. ODOT/BOLI Highway Construction Workforce Development Program - Key Performance Measures					
Policy Goal/Key Performance Measure	Previous Reporting Period	Current Reporting Period	Goal	Goal Met (within 2%)	Progress Made
Diversity of Journey Workforce - Credentialing Diverse Workers who Continue to Work in their Trade					
Six-Year Completion Rates (white women)	43.5%	41.7%	≥ 50%		✗
Six-Year Completion Rates (men of color)	35.6%	53.6%	≥ 50%	✓	✓
Six-Year Completion Rates (women of color)	30.2%	45.0%	≥ 50%		✓
Completion rate among those completed or terminated (white women)	36.3%	42.9%	≥ 50%		✓
Completion rate among those completed or terminated (men of color)	44.9%	40.6%	≥ 50%		✗
Completion rate among those completed or terminated (women of color)	24.2%	46.9%	≥ 50%		✓
Percentage of completed (white women)	4.0%	5.0%	≥ 8.0%		✓
Percentage of completed (men of color)	18.8%	15.7%	≥ 20.6%		✗
Percentage of completed (women of color)	1.0%	1.6%	≥ 2.0%	✓	✓
Percentage of survey respondents who completed their apprenticeship who are currently working in their trade as a journey worker (white women)	67.0%	83.3%	≥ 78%	✓	✓
Percentage of survey respondents who completed their apprenticeship who are currently working in their trade as a journey worker (men of color)	75.8%	79.5%	≥ 78%	✓	✓
Percentage of survey respondents who completed their apprenticeship who are currently working in their trade as a journey worker (women of color)	No Data	66.7%	≥ 78%		✓

Appendix I. Characteristics of Apprentices by Completion						
	Total		Women		Men	
	% of Completed	% of Terminated	% of Completed	% of Terminated	% of Completed	% of Terminated
Some college	26.6	29.4	54.1	36.5	23.5	28.6
Some vocational	14.3	11.4	29.7	15.9	12.5	10.9
Pre-apprenticeship (% in eligible trades)	6.7	4.7	51.4	20.6	2.0	2.7
Financial support services	30.4	19.7	51.4	41.3	28.1	16.9
Non-financial support services	2.1	0.9	10.8	7.9	1.1	0.2
Per Diem	6.7	4.2	8.1	3.2	6.5	4.4
Fuel	11.5	5.9	16.2	7.9	11.1	5.6
Child care	3.8	1.5	8.1	4.8	3.4	1.1
Tools	27.4	15.8	40.5	39.7	25.8	12.7
N	391	615	37	63	353	550
Source: OAS; active apprentices in 2016-17 in eligible trades						
Partnered	58.8	52.2	46.1	48.5	65.0	55.9
Spouse/partner works	47.1	29.4	44.4	31.3	48.1	27.8
Children in household	55.5	37.3	51.3	27.3	57.5	47.1
Children < 5 in household	34.5	20.9	23.1	12.1	40.0	29.4
Household size during (mean)	3.1	3.0	3.0	2.3	3.2	3.7
Individual income < 226% FPL	14.4	50.9	10.3	57.1	16.2	44.8
Household income < 226% FPL	36.3	55.7	38.5	54.8	35.1	56.7
Unemployment during	64.4	32.8	68.4	39.4	62.5	26.5
Public assistance during	8.5	10.5	5.3	12.1	10.0	8.8
Months out of work (mean)	1.4	1.8	1.8	2.3	1.1	1.4
Struggled to make ends meet often or always	14.4	23.9	10.3	36.4	16.5	11.8
Challenges faced						
Childcare	42.4	36.0	55.0	55.6	37.0	25.0
Out of work too much	19.3	49.3	20.5	57.6	18.8	41.2
Performed low-skill tasks	27.7	47.8	33.3	63.6	25.0	32.4
Lack of mentoring	29.4	50.8	38.5	69.7	25.0	32.4
Reliable transportation	16.0	13.4	18.0	12.1	15.0	14.7
Paying for gas	25.2	32.8	20.5	39.4	27.5	26.5
Paying for food and lodging	19.6	21.3	18.5	26.3	20.0	17.9
Buying tools and equipment	32.8	40.3	35.9	48.5	31.3	32.4
Experienced any discrimination	32.8	59.7	46.2	81.8	26.3	38.2
Experienced apprentice discrimination	10.9	37.3	18.0	54.6	7.5	20.6
Experienced racial discrimination	13.5	14.9	7.7	6.1	16.3	23.5
Experienced gender discrimination	15.1	44.8	46.2	78.8	0.0	11.8
Experienced age discrimination	7.6	28.4	12.8	42.4	5.0	14.7
Experienced unwanted sexual attention/comments	25.2	31.8	64.1	56.3	6.3	8.8
Witnessed other workers experience discrimination	49.6	41.8	61.5	48.5	43.8	35.3
N	119	67	39	33	80	34
Source: 2018 Survey						

Appendix I., cont. Characteristics of Apprentices by Completion								
	White Women		Women of Color		White Men		Men of Color	
	% of Completed	% of Terminated	% of Completed	% of Terminated	% of Completed	% of Terminated	% of Completed	% of Terminated
Some college	59.1	40.8	46.7	21.4	21.8	29.4	28.3	26.2
Some vocational	22.7	16.3	40.0	14.3	12.6	11.6	12.0	9.6
Pre-apprenticeship (% in eligible trades)	45.5	18.4	60.0	28.6	1.9	1.1	2.2	5.9
Financial support services	36.4	32.7	73.3	71.4	25.7	14.1	34.8	22.5
Non-financial support services	13.6	8.2	6.7	7.1	1.2	0.0	1.1	0.5
Per Diem	4.6	4.1	13.3	0.0	6.9	5.3	5.4	2.7
Fuel	9.1	6.1	26.7	14.3	10.3	4.7	13.0	7.5
Child care	4.6	2.0	13.3	14.3	2.7	0.8	5.4	1.6
Tools	27.3	30.6	60.0	71.4	23.0	10.0	33.7	18.2
N	22	49	15	14	261	361	92	187
Source: OAS; active apprentices in 16-17 in eligible trades								
Partnered	43.3	48.0	55.6	50.0	61.0	37.5	69.2	61.5
Spouse/partner works	38.5	41.7	60.0	0.0	28.0	33.3	66.7	26.7
Children in household	50.0	32.0	55.6	12.5	53.7	50.0	61.5	46.2
Children < 5 in household	20.0	12.0	33.3	12.5	39.0	37.5	41.0	26.9
Household size during (mean)	3.0	2.3	3.1	2.4	3.2	3.1	3.2	3.8
Individual income < 226% FPL	4.4	59.1	33.3	50.0	19.4	42.9	12.5	45.5
Household income < 226% FPL	40.0	60.9	33.3	37.5	41.0	42.9	28.6	60.9
Unemployment during	65.5	40.0	77.8	37.5	65.9	62.5	59.0	15.4
Public assistance during	3.5	8.0	11.1	25.0	7.3	0.0	12.8	11.5
Months out of work (mean)	1.6	2.6	2.4	1.6	1.0	1.9	1.3	1.2
Struggled to make ends meet often or always	13.3	36.0	0.0	37.5	17.1	0.0	15.8	15.4
Challenges faced								
Childcare	66.7	50.0	20.0	100.0	36.4	50.0	37.5	16.7
Out of work too much	20.0	52.0	22.2	75.0	24.5	62.5	12.8	34.6
Performed low-skill tasks	26.7	68.0	55.6	50.0	22.0	37.5	28.2	30.8
Lack of mentoring	40.0	76.0	33.3	50.0	34.2	50.0	15.4	26.9
Reliable transportation	20.0	12.0	11.1	12.5	19.5	25.0	10.3	11.5
Paying for gas	23.3	32.0	11.1	62.5	31.7	25.0	23.1	26.9
Paying for food and lodging	22.7	25.0	0.0	28.6	15.2	28.6	25.0	14.3
Buying tools and equipment	33.3	48.0	44.4	50.0	29.3	37.5	33.3	30.8
Experienced any discrimination	40.0	84.0	66.7	75.0	22.0	62.5	30.8	30.8
Experienced apprentice discrimination	16.7	52.0	22.2	62.5	7.3	37.5	7.7	15.4
Experienced racial discrimination	3.3	0.0	22.2	25.0	7.3	12.5	25.6	26.9
Experienced gender discrimination	40.0	80.0	66.7	75.0	0.0	25.0	0.0	7.7
Experienced age discrimination	10.0	40.0	22.2	50.0	4.9	25.0	5.1	11.5
Experienced unwanted sexual attention/comments	66.7	58.3	55.5	50.0	7.3	25.0	5.1	3.9
Witnessed other workers experience discrimination	53.3	44.0	88.9	62.5	51.2	62.5	35.9	26.9
N	30	25	9	8	41	8	39	26
Source: 2018 survey								

Appendix J. Characteristic of Service Recipients (2018 Survey)										
	Financial Support	Non-Financial	Both Types	Neither Type	Pre-App	No Pre-App	Travel	Fuel	Tools	Child Care
Individual income < 226% FPL before	67.2	78.3	75.0	61.0	79.3	61.8	79.2	69.4	66.7	50.0
Individual income < 226% FPL during	23.1	9.1	8.3	20.4	20.0	21.2	37.5	28.6	23.0	11.1
Household income < 226% FPL before	71.0	68.2	72.7	54.7	68.9	60.0	82.6	79.4	70.7	58.3
Household income < 226% FPL during	39.4	27.3	27.3	28.6	30.4	35.6	54.2	52.9	39.2	25.0
Unemployment before	21.8	25.0	23.1	19.8	21.4	20.5	28.0	29.7	19.8	38.4
Unemployment during	67.2	58.3	61.5	38.2	73.2	45.9	88.0	91.9	65.5	91.7
Public assistance before	36.0	45.8	53.9	23.8	39.3	27.0	45.8	38.9	36.5	33.3
Public assistance during	12.8	12.5	15.4	7.3	14.3	8.7	24.0	24.3	13.1	8.3
Took jobs otherwise would not have	67.3	65.0	63.6	n/a	80.0	64.5	78.3	73.5	66.9	54.6
Would not have completed w/o services	28.9	41.7	46.2	n/a	19.6	10.0	20.0	24.3	29.2	16.7
Months out of work	1.5	1.1	1.9	1.8	1.9	1.8	2.4	1.8	1.5	0.9
Completed	25.0	16.7	15.4	22.9	21.4	23.8	52.0	40.5	24.4	75.0
Active	63.9	79.2	76.9	62.2	66.1	62.9	36.0	56.8	64.9	25.0
Terminated	11.1	4.2	7.7	14.9	12.5	13.3	12.0	2.7	10.7	0.0
Individual income before										
0-100%	30.0	39.1	58.3	23.7	39.6	24.1	29.2	19.4	30.9	16.7
101-225%	37.3	39.1	16.7	37.3	39.6	37.7	50.0	50.0	35.7	33.3
226-280%	17.5	0.0	0.0	15.0	9.4	16.3	8.3	13.9	18.2	0.0
281-335%	10.2	13.0	16.7	12.0	7.6	11.7	8.3	8.3	10.3	41.7
> 335%	5.1	8.7	8.3	12.0	3.8	10.1	4.2	8.3	4.9	8.3
Individual income during										
0-100%	9.4	0.0	0.0	6.3	2.0	7.9	8.3	5.7	10.1	0.0
101-225%	13.8	9.1	8.3	14.0	18.0	13.3	29.2	22.9	12.8	11.1
226-280%	18.1	9.1	16.7	17.9	16.0	17.8	16.7	22.9	18.9	11.1
281-335%	18.1	27.3	16.7	22.1	18.0	21.5	8.3	14.3	19.6	22.2
> 335%	40.6	54.6	58.3	39.7	56.0	39.5	37.5	34.3	38.5	55.6
Household income before										
0-100%	29.6	31.8	54.6	19.7	31.1	22.1	34.8	26.5	30.7	25.0
101-225%	41.4	36.4	18.2	35.0	37.8	37.8	47.8	52.9	40.0	33.3
226-280%	16.1	18.2	18.2	15.3	22.2	14.9	13.0	11.8	16.0	25.0
281-335%	5.6	0.0	0.0	9.1	2.2	8.2	0.0	2.9	6.0	16.7
> 335%	7.4	13.6	9.1	20.8	6.7	16.9	4.4	5.9	7.3	0.0
Household income during										
0-100%	9.4	4.6	9.1	5.0	6.5	6.4	12.5	11.8	10.1	0.0
101-225%	30.0	22.7	18.2	23.6	23.9	26.2	41.7	41.2	29.1	25.0
226-280%	18.1	4.6	0.0	16.1	15.2	16.8	8.3	23.5	18.9	33.3
281-335%	12.5	0.0	0.0	17.5	10.9	15.8	20.8	8.8	12.2	25.0
> 335%	30.0	68.2	72.7	37.9	43.5	34.8	16.7	14.7	29.7	16.7
N	180	24	13	315	56	450	25	37	168	12
Source: 2018 Survey										

Appendix K. Characteristics of Parents and Child Care Support Recipients (2018 Survey)								
	Parents	Non-Parents	Parents w/ children	Single Parent	Partnered Parent	Father	Mother	Received child care
Received child care support	4.8	n/a	5.1	2.1	5.6	7.3	1.2	100.0
Child care services allowed me to work more	71.4	n/a	75.0	100.0	66.7	66.7	100.0	71.4
Identified cost of child care as problem	33.5	n/a	36.2	48.9	28.9	26.0	44.6	50.0
Identified finding consistent child care as problem	29.0	n/a	31.6	38.3	26.3	21.1	40.5	50.0
Number of children	2.0	n/a	2.1	1.7	2.1	2.0	2.0	2.3
White male	19.2	18.8	24.8	12.5	21.3	32.5	n/a	30.0
White female	33.2	37.6	23.1	54.2	26.9	n/a	81.2	10.0
Minority male	39.9	33.9	45.3	16.7	46.9	67.5	n/a	60.0
Minority female	7.7	9.7	6.8	16.7	5.0	n/a	18.8	0.0
Single	23.1	59.4	16.2	100.0	0.0	11.4	40.0	10.0
Partnered	76.9	40.6	83.8	0.0	100.0	88.6	60.0	90.0
Partner works	66.0	0.0	55.1	n/a	66.0	60.2	78.4	66.7
Household Size	4.0	2.2	4.2	3.3	4.2	4.1	3.8	4.2
Individual income < 226% FPL	20.9	21.3	21.3	26.8	19.2	17.7	25.7	12.5
Household income < 226% FPL	49.7	19.6	55.9	64.3	45.6	47.8	52.6	30.0
Unemployment	57.5	43.0	61.5	43.8	61.6	61.8	51.2	90.0
Public assistance	15.5	5.0	19.7	18.8	14.5	12.2	20.2	10.0
Months out of work	1.5	1.2	1.5	1.4	1.5	1.2	1.9	0.7
Child care arrangements								
Spouse or partner	34.6	n/a	49.6	8.3	42.5	46.3	17.7	20.0
Unpaid friend or family member	18.3	n/a	20.5	18.8	18.1	18.7	17.7	10.0
Paid child care provider	25.0	n/a	27.4	37.5	21.3	21.1	30.6	60.0
Children old enough to take care of selves	15.9	n/a	2.6	25.0	13.1	7.3	28.2	10.0
Other arrangements	6.3	n/a	0.0	10.4	5.0	6.5	5.9	0.0
Struggled to make ends meet	16.4	13.1	15.4	22.9	14.5	12.3	22.4	10.0
Completed	31.7	17.8	35.0	31.3	31.9	37.4	23.5	70.0
Active	56.3	68.1	53.0	56.3	56.3	49.6	65.9	30.0
Terminated	12.0	14.1	12.0	12.5	11.9	13.0	10.6	0.0
Experienced discrimination	35.6	43.6	35.0	29.2	37.5	27.6	47.1	58.3
N	208	298	117	48	160.0	123.0	85.0	10.0
Source: 2018 Survey Data								

Appendix L. Correlations between challenges and completion						
	Correlation with Apprenticeship Completion					
Standardized variables	Men	Women	White Men	Minority Men	White Women	Minority Women
Individual income	0.42	0.58	0.17	0.54	0.65	0.41
Household income	0.22	0.08	0.08	0.26	0.10	0.00
Children in household	0.04	0.23	-0.06	0.12	0.16	0.51
Spouse/partner	0.01	-0.05	0.08	0.04	-0.06	0.00
Unemployment benefits	0.31	0.21	-0.05	0.41	0.22	0.17
Public assistance	-0.05	-0.18	0.09	-0.04	-0.21	-0.19
Struggled to make ends meet	0.07	-0.21	0.17	0.05	-0.16	-0.45
Challenges						
Being out of work	-0.29	-0.36	-0.5	-0.26	-0.33	-0.51
Paying for tools/PPE	0.01	-0.12	-0.1	0.07	-0.15	0.00
Paying for per diem	0.10	-0.04	-0.16	0.27	-0.02	-0.29
Paying for transportation	-0.06	0.12	-0.21	-0.04	0.15	0.00
Paying for gas	0.04	-0.12	0.03	0.02	-0.01	-0.51
Finding a mentor	-0.09	-0.23	-0.21	-0.09	-0.25	-0.17
Being assigned low skill tasks	-0.13	-0.22	-0.26	-0.07	-0.32	0.17
Discrimination						
Any unwanted sexual attention	-0.03	0.06	-0.24	0.05	0.08	0.00
Any discrimination	-0.02	-0.16	-0.13	0.04	-0.26	0.19
Discrimination due to apprentice status	-0.16	-0.37	-0.24	-0.15	-0.33	-0.51
Discrimination due to age	-0.11	-0.35	-0.13	-0.10	-0.35	-0.35
Discrimination due to gender	-0.29	-0.27	-0.5	-0.21	-0.33	0.00
Discrimination due to race/ethnicity	-0.04	0.06	-0.09	0.06	0.14	0.00
Discrimination due to sexual orientation	-0.20	-0.12	n/a	-0.21	-0.01	-0.45
N	104	59	44	60	47	12
Source: 2018 Survey; sample includes apprentices completed or cancelled						

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