

**(Still) Building A More Diverse Workforce in the
Highway Trades:
2016 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 pre-apprenticeship programs and provides financial assistance (i.e. fuel assistance, support for overnight travel, childcare, and work clothes, tools, and protective equipment) and non-financial support (i.e. counseling, formal mentoring, social support) in an effort to increase the recruitment and retention of women and people of color in Oregon’s highway construction trades.

In 2014, Measure of America, in collaboration with Portland State University, released a report assessing the impact of the Highway Construction Workforce Development Program. The current report follows up on the 2014 study to assess the continued effectiveness of supportive services on the recruitment and retention of apprentices, with a particular emphasis on women and people of color. This report provides findings based on data from the Oregon Apprenticeship System (OAS) and a phone survey, conducted in March of 2016, of current and recently active apprentices. We compare these more recent findings with those reported in 2014 in order to provide continued assessment of ODOT/BOLI’s Highway Construction Workforce Development Program.

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 as well as recommendations for continuing to improve the recruitment and retention of a diverse work force.

Finding 1: While progress is slow, the Oregon highway construction workforce is becoming more diverse, with increased integration of women and people of color in apprenticeships. As shown in Figure 1, in 2015, the percentage of new apprentices who were white men dropped to 70% (OAS data). As a result of increased recruitment, women and people of color comprise a growing proportion of those completing apprenticeships between 2010 and 2015 (Figure 2). Future evaluations will measure completion using six-year completion rates once cohorts targeted for services have had sufficient time to complete.

Figure 1. New Apprentices in Oregon Heavy Highway Construction Trades by Race and Gender, 2005-2015 Cohorts (OAS Data)

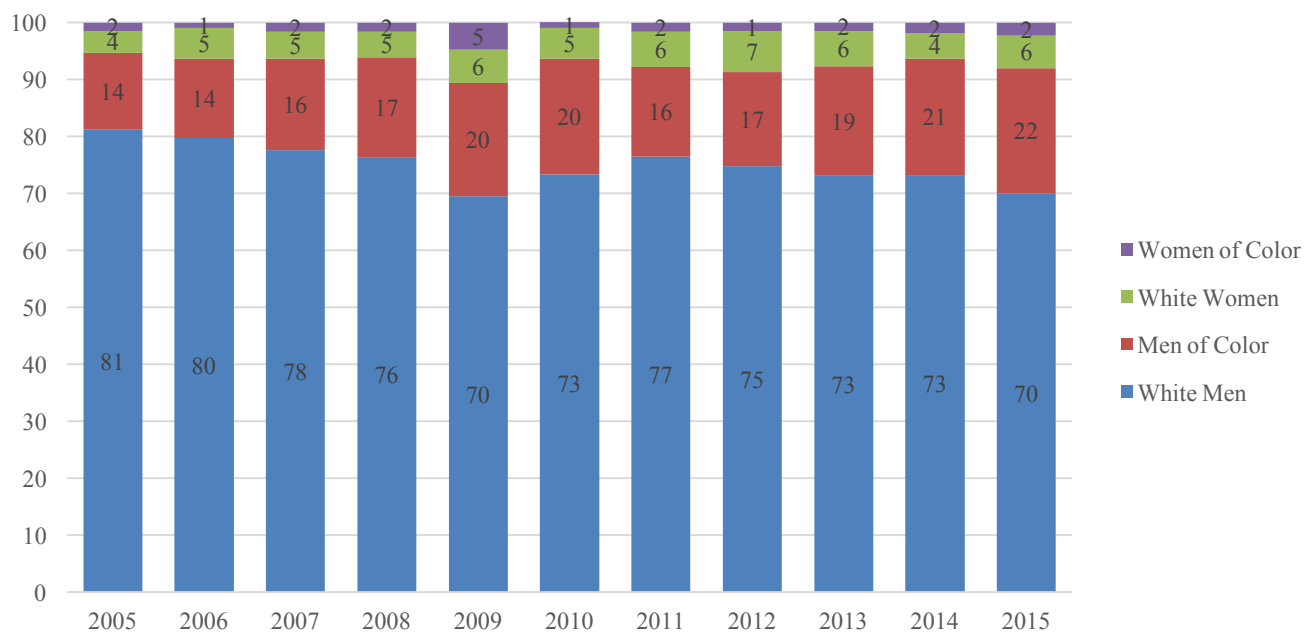
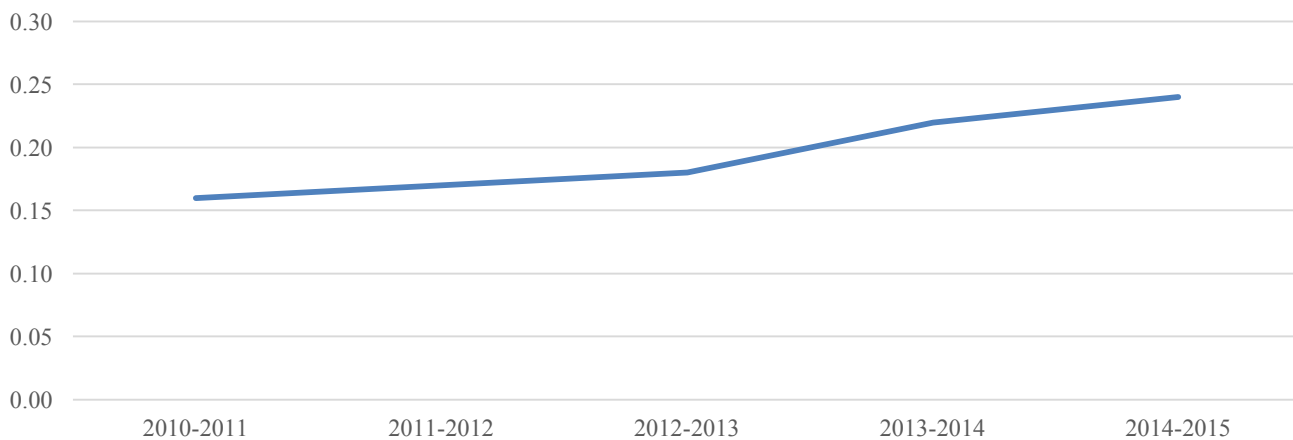
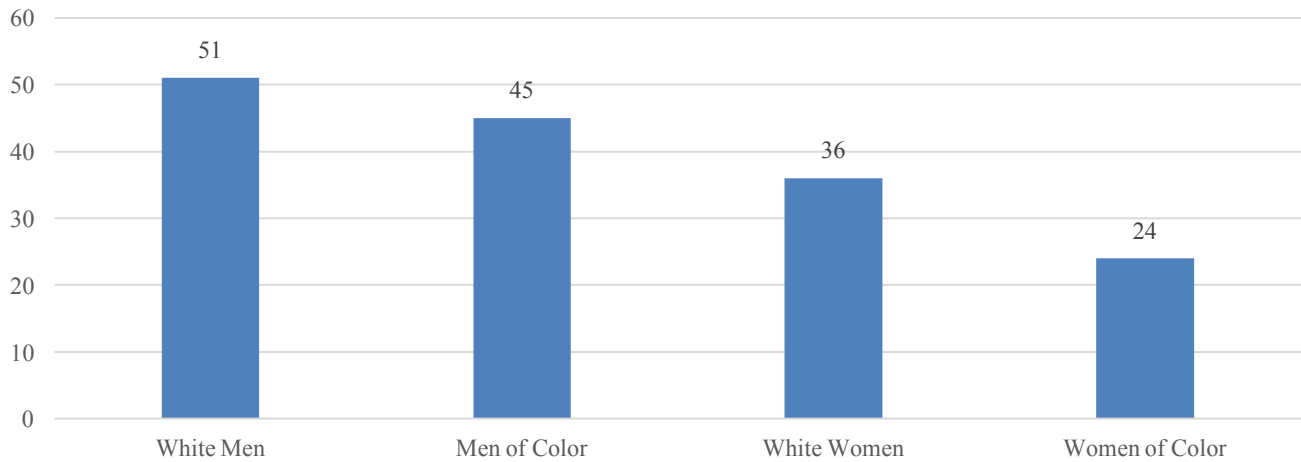


Figure 2. Percentage Completing Who are Women and People of Color, by Year (OAS Data)



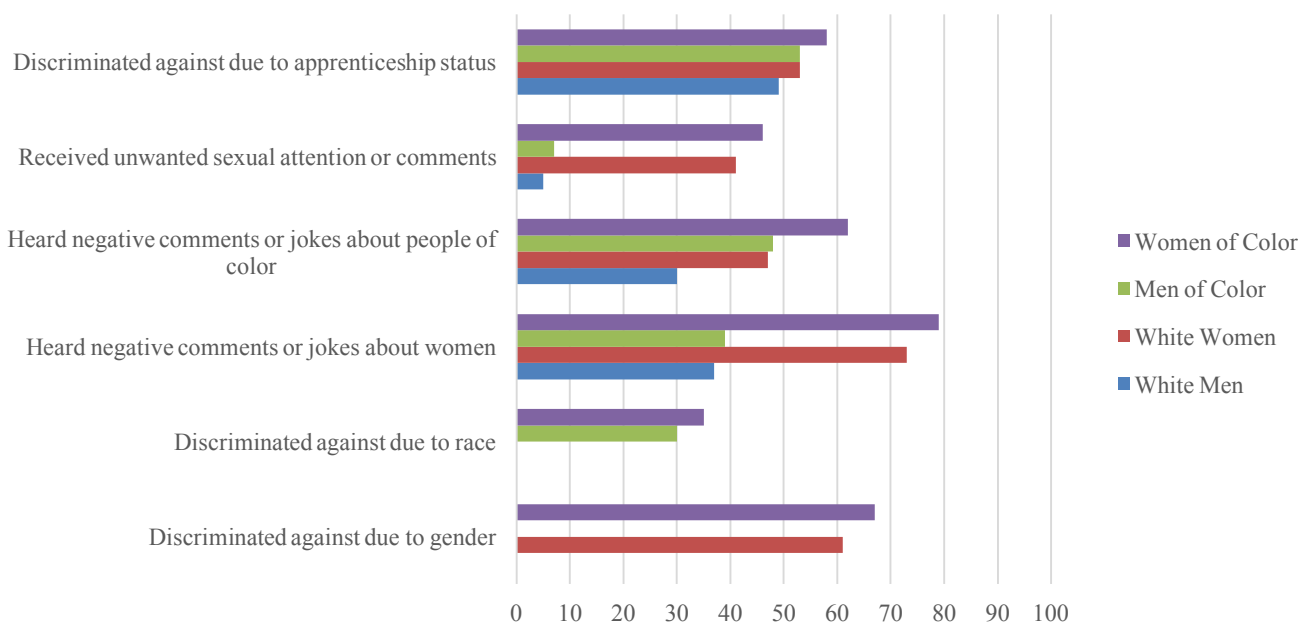
Finding 2: *Female and racial/ethnic minority apprentices continue to have lower completion rates than white men. Among apprentices active in 2014-15, women and men of color were less likely than white men to complete rather than terminate their apprenticeships by the end of 2015 (Figure 3).*

Figure 3. Completion Rates of Recently Active (2014-2015) Apprentices, by Race and Gender (OAS data)



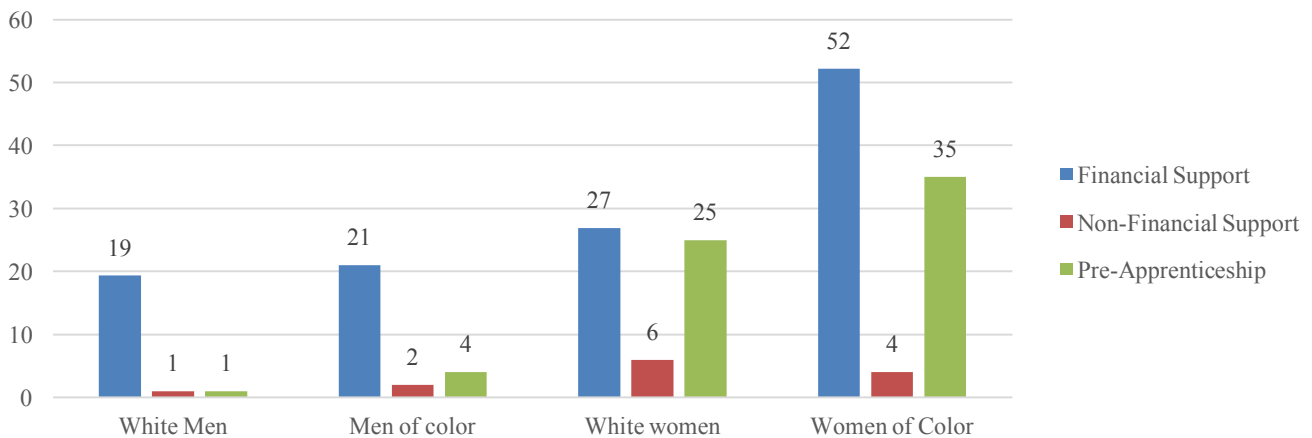
Finding 3: *Hostile workplaces continue to be an issue in the trades. Figure 4 shows that all race-gender groups experience discrimination and harassment, with women and people of color specifically targeted for their gender and/or race/ethnicity. Rates of reporting harassment and discrimination on the job site due to race/ethnicity and gender did not decline between 2014 and 2016.*

Figure 4. Percentage of Apprentices Witnessing or Experiencing Discrimination or Harassment, by Race and Gender (2016 Survey Data)



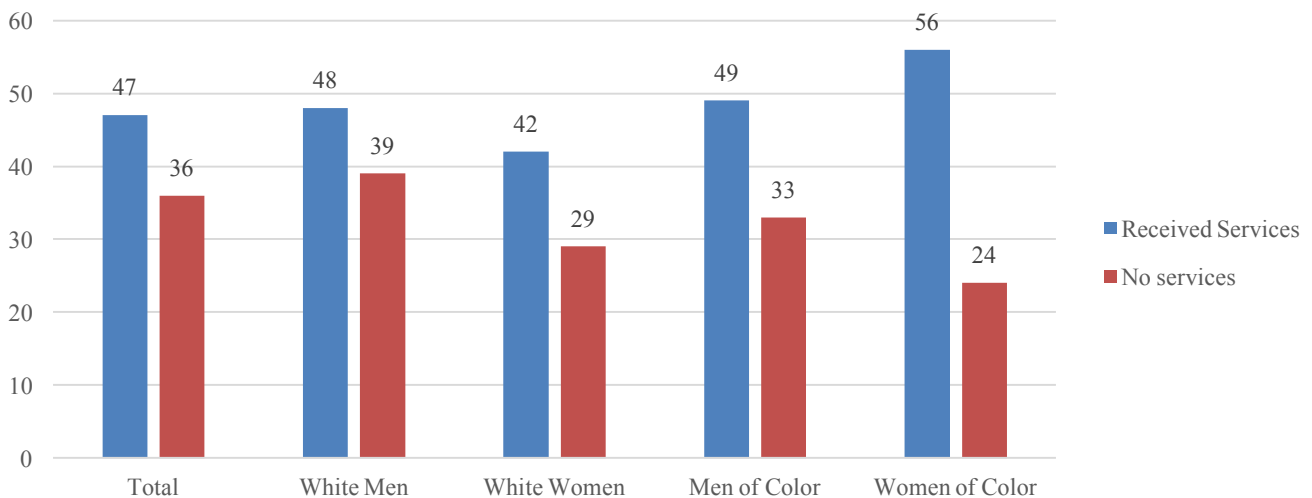
Finding 4: *The Highway Construction Workforce Development Program reaches a diverse group of apprentices. As shown in Figure 5, while race/ethnicity and gender are not criteria for receiving services, the program has been successful in reaching disadvantaged apprentices. The percentage of women and people of color receiving services increased between 2014 and 2016.*

Figure 5. Percentage of Apprentices in Eligible Trades Active in 2014-2015 Served by ODOT/BOLI Services, by Race and Gender (OAS Data)



Finding 5: *The Highway Construction Workforce Development Program improves 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 Receipt of ODOT/BOLI Supportive Services, by Race and Gender (OAS Data; 2005-2015 Cohorts)



The report concludes with an update on the 2014 recommendations for creating a more diverse workforce in the highway trades. These recommendations include:

- Continue efforts to recruit diverse workers into apprenticeships
- 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
- Strengthen and expand pre-apprenticeship programs and retention services throughout the state
- Continue efforts to promote awareness of ODOT/BOLI supportive services
- Continue to assess ways to use Highway Construction Workforce Development Program funds most effectively

INTRODUCTION

While white men have historically dominated the highway construction trades in Oregon, this trend is changing: of those enrolled in apprenticeships in the highway construction trades in 2005 81% were white men; in 2015, this number was 70%. Of apprentices who completed an apprenticeship in 2010, 84% were white men; in 2015, this number was 79%. 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 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 2016. In addition, we compare these findings to those previously reported in 2014. 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 increased since a) the inception of the program in 2010 and b) the previous reporting period in 2014? 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 2014 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; Hegewisch and O'Farrell 2015; Kelly et al. 2015). The perception that construction work remains a job for white men, issues of work/family conflict in the construction trades, 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 as well as racial/ethnic, gender, heterosexist, and sexual harassment and 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 (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; 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. Many of these initiatives have proved to be successful; for example, in Oregon, women make up 7.8% of new apprentices (see findings of this report, below), compared to 2.6% nationally (National Women’s Law Center 2014). 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. and Constructing Hope.

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

In 2015, direct assistance provided to apprentices by Akana and the Laborers Training Trust totaled \$150,465.53.

Utilization of the Highway Construction Workforce Development Program Services

Between 2014 and 2016, awareness of the program has increased. In the 2014 survey, 33.6% of apprentices in eligible trades were aware of the program; in the 2016 survey, 46.4% of apprentices were aware of the program.

Since the previous reporting period there has been an increase in the percentage of apprentices in eligible trades receiving financial support services. Among apprentices active in eligible trades in the previous reporting period, 14.5% received ODOT/BOLI financial support services; among apprentices active in eligible trades in the most recent reporting period, 21.4% received ODOT/BOLI financial support services (Table 1). This increase is evident across all gender and Racial/ethnic groups. While women and people of color are not specifically targeted for financial support services, women, particularly women of color, are receiving financial support services higher rates than other race-gender groups.

Table 1. Percentage of Eligible Apprentices Receiving BOLI-ODOT Financial Support Services by Race/Ethnicity and Gender

	Previous Reporting Period							
	Total	Men	Women	White Men	Men of Color	White Women	Women of Color	
% Receiving Financial Support Services (among those in eligible trades)	14.5	13.3	24.5	12.5	15.3	20.8	34.5	
	Current 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	

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

Similar to the previous reporting period, among apprentices who received any financial support service during the current reporting period, there was variation in the type of financial support received. In the current reporting period, more than 80% of financial support recipients (82.9%) received support to purchase tools and protective equipment, which was up from the approximately 70% who received this support in the previous reporting period (Table 2). In contrast, only 11.6% of apprentices receiving financial support received support for childcare in the current reporting period, which is similar to the percentage receiving this service in the previous reporting period (11.8%). The financial supports most

commonly received in both reporting periods were 1) support to purchase tools and equipment, 2) support for purchasing fuel, and 3) support for paying for lodging and per diem.

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

	Previous Reporting Period			
	Childcare	Lodging/PerDiem	Fuel	Tools/Equipment
% Receiving Financial Support Service (among apprentices receiving any financial supports)	11.8	37.3	52.7	69.2
	Current Reporting Period			
	Childcare	Lodging/PerDiem	Fuel	Tools/Equipment
	11.6	29.9	42.2	82.9

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

There was also variation in receipt of specific financial support services by race-gender groups (see Appendix B) in the current reporting period. A greater percentage of women (19%) than men (12%) receiving financial support services received support for childcare, yet this gender difference was evident only among apprentices of color: 24% of women of color receiving support services received support for childcare, while 11% of men of color receiving support services did so. Among white apprentices receiving financial support services, an equal percentage of men and women (13%) received childcare support. This mirrors race-gender differences in receipt of childcare support found in the previous reporting period. These gender differences may reflect the pattern observed among apprentices surveyed: men are much more likely than women to have a spouse or partner at home taking care of children (36% vs. 7%) (see Appendix D).

In the current reporting period, a greater percentage of men (43%) than women (27%) receiving support services received fuel support, and a greater percentage of men (29%) compared to women (14%) received per diem support. The gender difference in fuel support receipt mirrors that found in the previous reporting period, while the gender difference in per diem support was not observed in the previous reporting period. These gender differences are consistent across racial groups. 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 current survey of apprentices, we found that men were more likely than women to report traveling out of town for jobs (79% vs. 61%) (see Appendix D), and this gender difference was larger among apprentices of color (79% vs. 46%) than among white apprentices (79% vs. 66%).

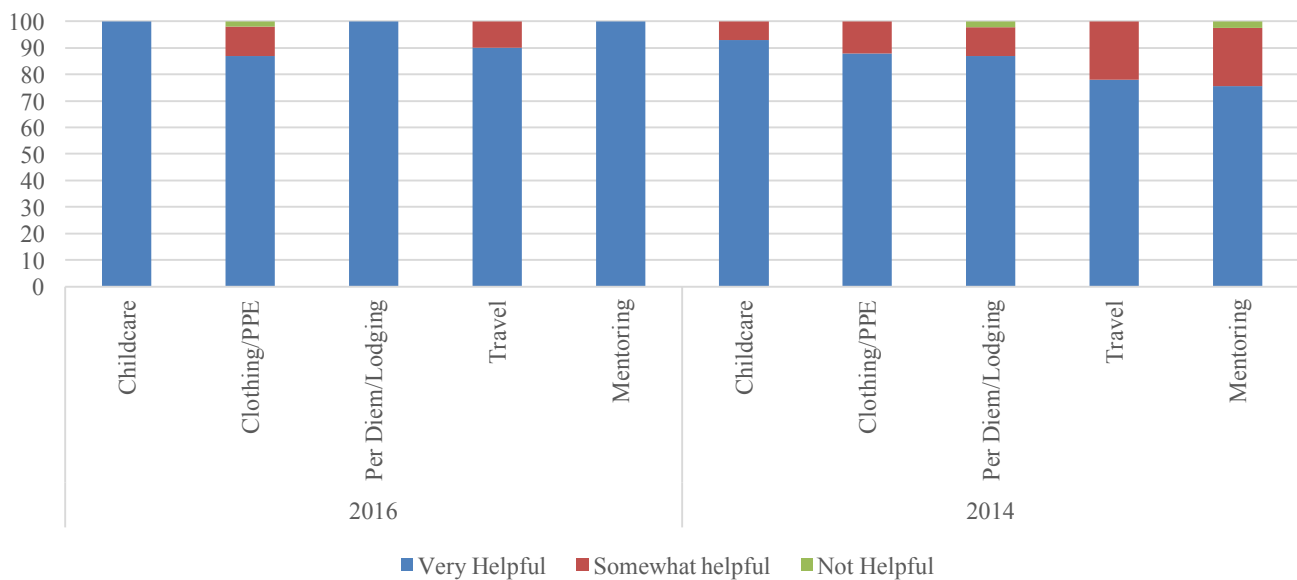
A smaller percentage of apprentices receive non-financial supportive services compared to financial supportive services. In the current reporting period, only 2% of apprentices in eligible trades received non-financial support services (i.e., counseling, mentoring, social support), with a larger percentage of women (5%) and women of color (4%) receiving non-financial supportive services (Appendix B). Rates of receiving non-financial supportive services decreased, however, from the previous reporting period, during which approximately 8% of white women and 10% of women of color received non-financial supportive services.

In 2014 and 2015, 266 individuals completed a pre-apprenticeship through Oregon Tradeswomen, Inc. and Constructing Hope. This included 28 white men, 110 white women, 65 men of color, and 63 women of color. For apprentices active in 2014-2015, 5% of those in eligible trades completed a pre-apprenticeship, with women and people of color more likely to enter the trades via a pre-apprenticeship: 25% of white women, 35% of women of color, and 4% of men of color completed a pre-apprenticeship (Appendix B). Pre-apprenticeship programs are helping 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.

Assessment of Services

In the 2016 survey, we continue to find that the majority, if not all, of the supportive service recipients viewed ODOT/BOLI supportive services as “very helpful.” Among respondents who received each type of support, large majorities reported that they found ODOT/BOLI financial and social supports helpful to them. The only services that any apprentices reported any dissatisfaction with were support for tools and protective equipment, yet only 2% of those receiving this service said the service was not helpful. Among those receiving services, all racial/ethnic groups found these services helpful (Figure 1; Appendix D).

Figure 1. Apprentice Evaluation of BOLI-ODOT Financial and Social Support Services, by Survey Year (2016 Survey Data)



Similar to 2014 survey results, in 2016 we also found that many apprentices receiving services felt that services enabled them to take jobs they otherwise would not have taken and were a key to completion of their apprenticeship (Appendix D). Of all apprentices receiving ODOT/BOLI services, 70% said the services allowed them to take jobs they otherwise would not have, with women more likely than men to report this. Also, 71% of all apprentices receiving supportive services stated that these services enabled them or will enable them to complete their apprenticeship. White women receiving services were most

likely (85%) and women of color least likely (40%) to report this, yet these differences are not statistically significant and should be interpreted with caution given the small number of women, particularly women of color, receiving support services.

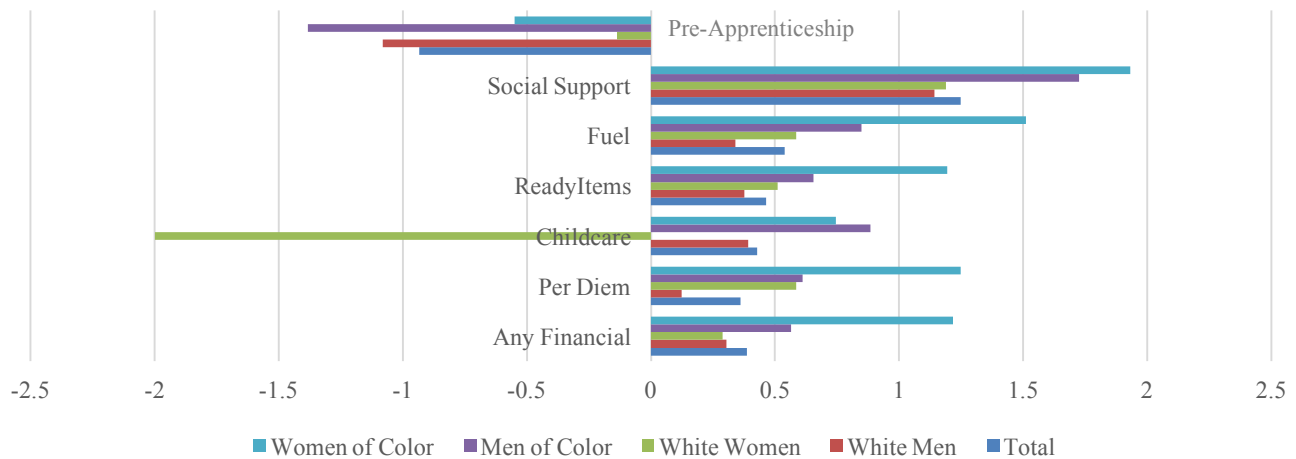
It is important to note the effectiveness of ODOT/BOLI supportive services in assisting apprentices in completion of their apprenticeship. Among 2005-2015 cohorts of apprentices in eligible trades who completed or terminated their apprenticeship by the end of 2015, those receiving ODOT/BOLI financial and non-financial support services were more likely than those not receiving these services to complete their apprenticeships (Figure 2). Non-financial support services, in the form of social support or mentoring, appear to have larger effects on completion than do financial support services, although a smaller percentage of apprentices have received non-financial support services compared to financial supportive services.¹ Women of color appear to benefit the most, in terms of apprenticeship completion rate, from financial and non-financial support services, although there are relatively few women apprentices of color and even fewer who have received support services. The one exception to this is support for childcare: men of color appear to benefit the most from financial assistance with childcare. Surprisingly, white women who receive financial support for childcare are actually less likely to complete an apprenticeship than are those who do not receive financial support for childcare.²

Results also show that those completing a pre-apprenticeship program are *less* likely than those not completing a pre-apprenticeship program to complete an apprenticeship. This finding should be interpreted with caution, however, given the unique challenges faced by those participating in pre-apprenticeship programs. As an example, a recent study of pre-apprenticeship programs found that participants were mostly women and people of color and that nearly half of all recent participants in Constructing Hope's pre-apprenticeship program have a criminal history and half are receiving public assistance; more than one-third of recent participants in OTI's pre-apprenticeship program receive public assistance (Wilkinson and Kelly 2016). The number of apprentices completing pre-apprenticeships is still relatively small, so it is difficult to assess the impact of these services solely through examining status at one point in time. It may be that pre-apprenticeship programs attract workers with challenges that make it difficult for them to complete an apprenticeship program, whereas a worker with a different pathway into the trades who did not need a pre-apprenticeship program may have fewer challenges.

¹ Among the 2005-2015 cohorts (N=13639), 1% of apprentices received non-financial supportive services, and 5% received financial supportive services (see Appendix I).

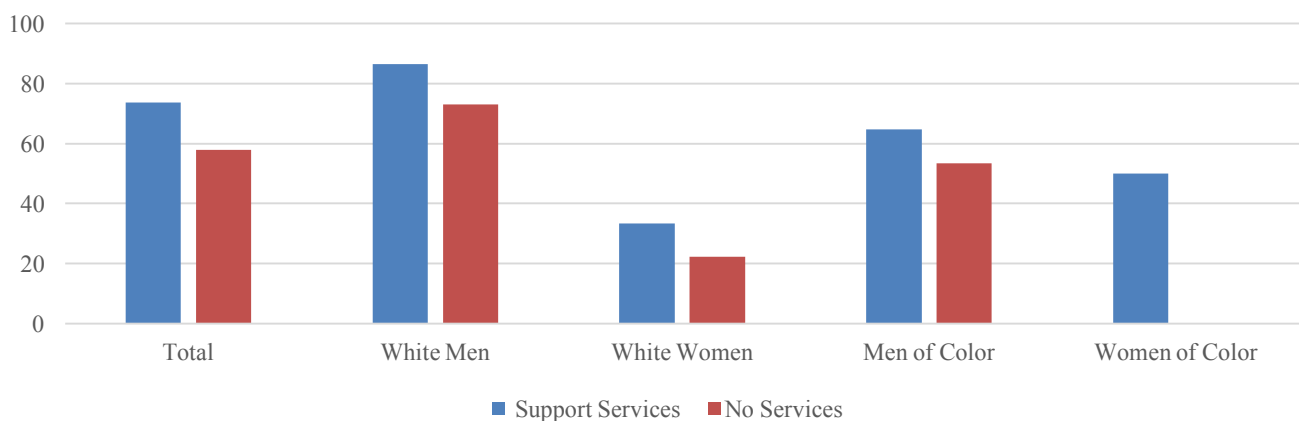
² Similarly, analysis using 2016 survey data suggests that, among parents, receiving financial support for childcare is negatively associated with completion among those completed or terminated. White women with children are the least likely of all race-gender groups to have a spouse or partner to help with child care (Appendix D). For single parents, both affording childcare and finding consistent childcare (including care for children on weekends and evenings) can be a significant challenge.

Figure 2. Change in Log Odds of Completing an Apprenticeship when Receiving ODOT/BOLI Supportive Services, by Race and Gender (2005-2015 Cohorts of Apprentices in Eligible Trades, OAS Data)



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 in construction after their apprenticeships, either as journey workers or in another capacity within construction. Those receiving ODOT/BOLI supportive services are more likely than those not receiving services to be working in construction following their apprenticeships.

Figure 3. Percentage of Apprentices in Eligible Trades Working as Journey Worker or in Construction after Apprenticeship, by Receipt of Services (2016 Survey Data)

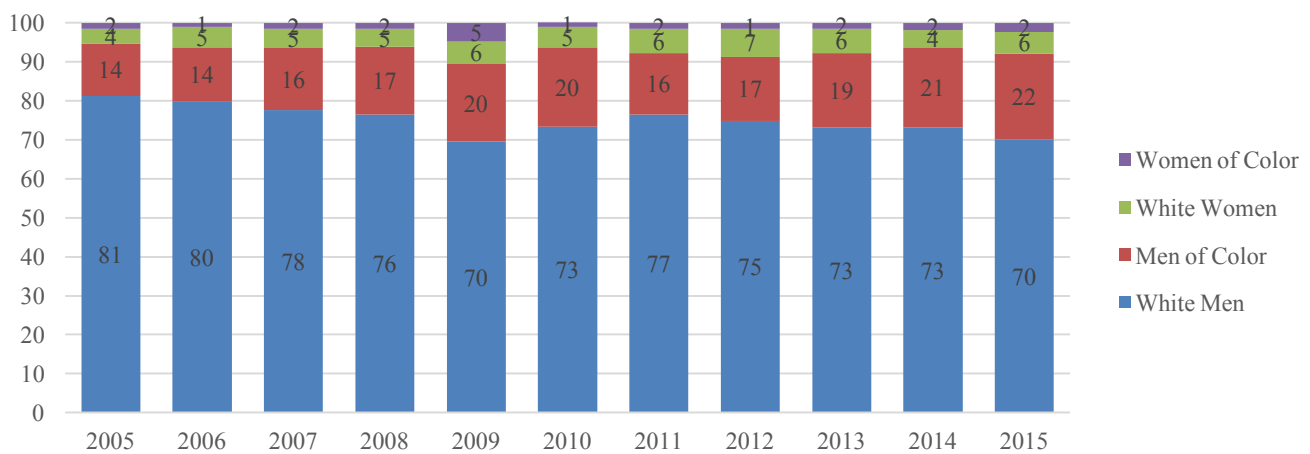


WORKFORCE DIVERSITY TRENDS IN OREGON’S HEAVY HIGHWAY TRADES

The number of new apprentices each year in the heavy highway construction trades fluctuates as workforce demands fluctuate. However, enrollment rates have been relatively stable since 2013: between 2016 Evaluation of the Highway Construction Workforce Development Program

2013 and 2015, approximately 1600 apprenticeship agreements have been entered into each year. While white men continue to comprise the overwhelming majority of new apprentices, between 2011 and 2015 the percentage of new apprentices accounted for by white men declined from 77 to 70 percent (Figure 4), as women and people of color account for a greater share of new apprentices. Between 2013 and 2015 the percentage of new apprentices who were women remained relatively steady (7.7% in 2013 compared to 7.9% in 2015), while people of color accounted for a greater share of new apprentices, increasing from 20.7% in 2013 to 24.5% in 2015. These recent trends are evidence of continued progress in the diversification of the heavy highway trades workforce.

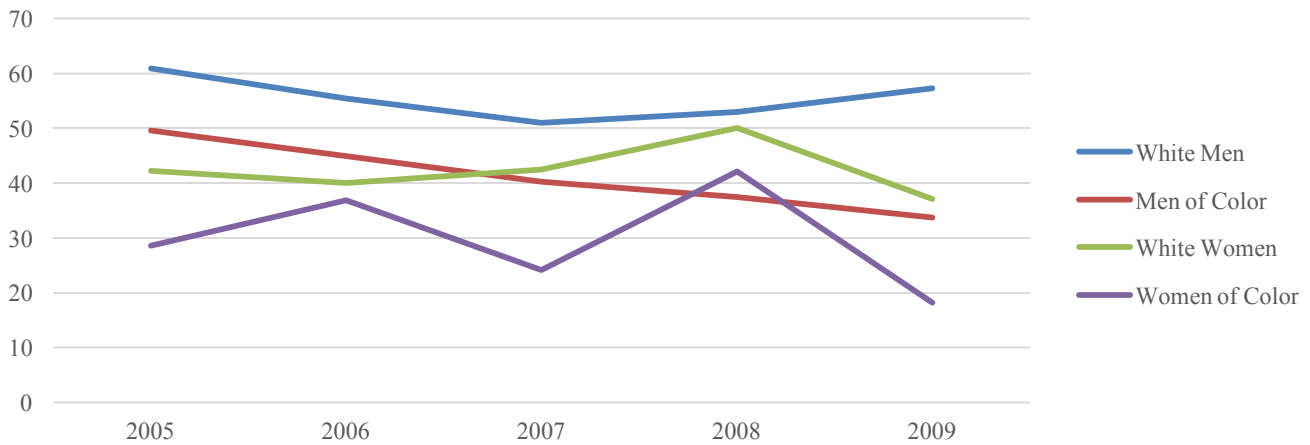
Figure 4. New Apprentices in Oregon Heavy Highway Construction Trades by Race and Gender, 2005-2015 Cohorts (OAS Data)



The previous report 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). We continue to agree with this statement and offer two measures of completion in the current reporting period to support this claim.

We first examine six-year completion rates by race-gender groups for the 2005-2009 cohorts (Figure 5; Appendix A). The trends by race-gender groups are in fact striking, although the recession of 2008 may complicate the trend analysis. Overall, six-year completion rates have not increased over time. The overall six-year completion rate in 2005 was 58.1, compared to 50.4 in 2009. Even for white men, six-year completion rates have remained stagnant, although they rose slightly between 2007 and 2009 after declining between 2005 and 2007. Six-year completion rates for all other race-gender groups, however, have declined since 2008. The largest decline between 2008 and 2009 was among women of color: the six-year completion rate for women of color in the 2008 cohort was 42.1, yet it dropped to 18.2 among the 2009 cohort.

Figure 5. Six-Year Completion Rates by Race and Gender, 2005-2009 Cohorts (OAS Data)



While we argue that six-year completion rates may be more accurate measures of completion, we acknowledge that we are unable to assess the completion rates of newer cohorts of apprentices, those more likely to receive ODOT/BOLI support services. The majority of apprentices receiving ODOT/BOLI support services began their apprenticeships after 2009. Thus, the measure of completion used in previous reports is informative in the interim. When completion rates are measured as the percentage of apprentices completing by 2015 among those no longer active (completed or terminated), we also see stalled progress in completion rates by race/ethnicity and gender. In the current reporting period, while 50.7% of completed or terminated white male apprentices active in 2014-15 completed their apprenticeship, only 24.2% of women of color, 36.3% of white women, and 44.9% of men of color had completed by the end of 2015 (Table 3). As in the 2014 report, we continue to note significant challenges in retaining women and people of color in apprenticeships. We also see a decline in completion rates relative to the previous reporting period (2014) among all apprentices. Yet despite this lack of growth in completion rates among women and people of color, due to increased recruitment of minorities into apprenticeships, men of color comprised 18.8% of apprentices completing in 2014-15, up from 12.1% of those completing in 2011-13 (Appendix H).

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

% Completing (among those completed or terminated)	Previous Reporting Period				
	Total	White Men	Men of Color	White Women	Women of Color
	64.7	68.1	51.9	54.7	41.9
% Completing (among those completed or terminated)	Current Reporting Period				
	Total	White Men	Men of Color	White Women	Women of Color
	48.3	50.7	44.9	36.3	24.2

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

MAJOR CHALLENGES FACING APPRENTICES

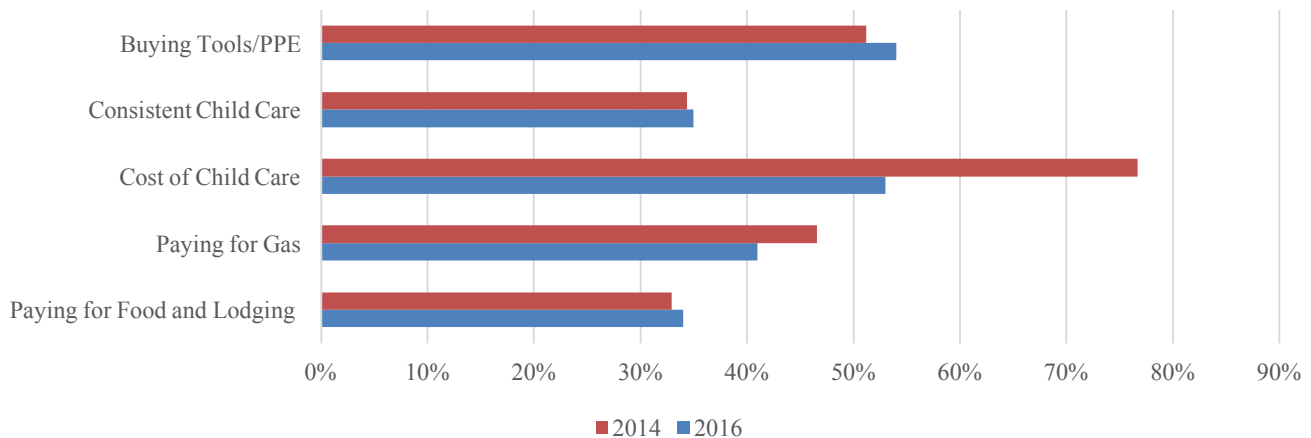
Financial Challenges

One major aim of the survey was to assess the challenges current and former apprentices face on and off the jobsite and to compare perceptions of challenges to those reported in the previous reporting period. 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” (Figure 6). In the 2016 survey, however, a smaller percentage of apprentices with children identified childcare as a major or minor problem (53%). Many of the findings that distinguished men and women in respect to traditional gendered expectations found in 2014 were also present in 2016. Results from the most recent survey confirm that cost of child care concerns are higher among women than among men, specifically among white women. This is particularly significant given that white women are the least likely of all race-gender groups to have children under the age of 18 living in their household during their apprenticeship. White women with children, however, are also the least likely of all race-gender groups to have a spouse or partner to help with child care, and the least likely to use a paid child care provider outside of the home, relying most heavily on unpaid friends and family for child care (Appendix D). While male apprentices are more likely than female apprentices to report having dependent children living with them during their apprenticeship (51% vs. 37%), men are more likely than women to depend on a spouse or partner for child care (36% vs. 7%), reflecting the persistent gendered division of labor in which women are expected to work within the home whereas men are expected to work in the paid labor market. Moreover, the finding that more male than female apprentices are responsible for dependent children suggests that women with children, especially white women with children, are a particularly difficult population to recruit into the heavy highway construction trades.

Female apprentices are also more likely than male apprentices to report finding *consistent* child care a challenge (53% vs. 32%), and again, of all race-gender groups, white women were most likely to report this as a challenge (60%), compared to only 30% of women of color. Women are also more likely than men to report being out of work too much as a challenge (60% vs. 50%), although women of color are more likely than white women to report this as a challenge (71% vs. 57%). Finally, male apprentices are more likely than female apprentices to take jobs out of town (79% vs. 61%), and while this difference may be linked to other factors, taking jobs out of town is likely more difficult for apprentices with dependent children who must rely on paid childcare.

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 less than \$30,000 were the most likely of all income groups to report the cost of childcare as a challenge (65%) and were also the most likely to report being out of work as a problem (64% vs. 34% for highest income group).

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



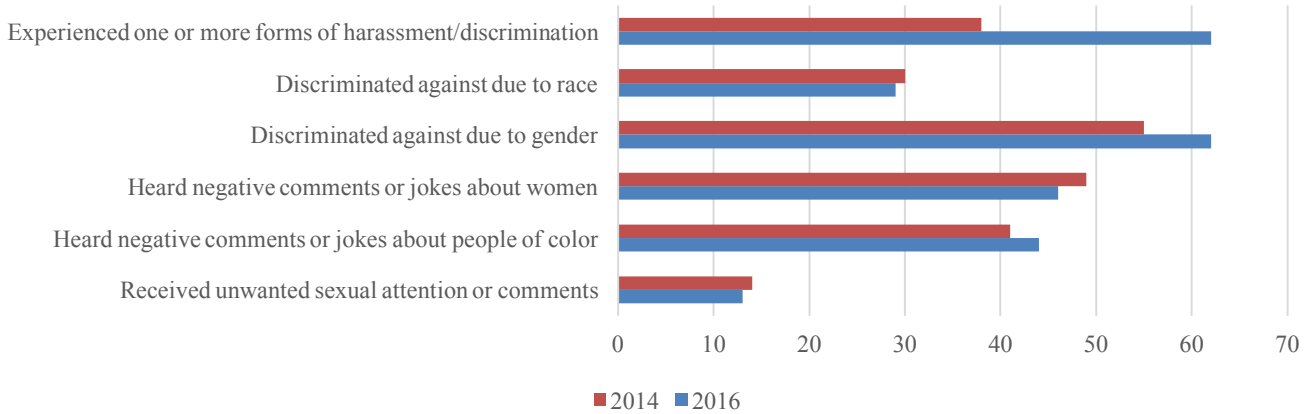
Similar to responses from the 2014 survey, in 2016, purchasing tools, clothing, and protective equipment was a concern for more than 50% of respondents, with men of color and white women more likely than white men to identify this as a challenge. Citing purchasing tools, clothing, and protective equipment as a problem also varied by household income, with those in the lowest household income category most likely to report this as a problem and those in the highest income category least likely to report this as a problem. A smaller percentage of apprentices identified paying for gas and paying for food/lodging as a challenge, and this varied little by race/ethnicity or gender. The likelihood of reporting these additional financial challenges did, however, vary by household income, with those in the lowest income category most likely to report these as challenges.

Workplace Culture and Discrimination

Similar to results from the 2014 survey, workplace culture again emerged as a major challenge faced by apprentices in 2016. In the 2016 survey, 46% of apprentices reported hearing negative comments or jokes about women sometimes or often, 44% reported hearing negative comments or jokes about people of color sometimes or often, and 13% reported receiving unwanted sexual attention or comments sometimes or often. These rates are similar to those observed in 2014, with a slightly lower percentage of respondents reporting hearing negative comments/jokes about women and a slightly higher percentage of respondents reporting hearing negative comments or jokes about people of color sometimes or often (Figure 7). Not surprisingly, women were more likely to report hearing negative comments or jokes about women on the jobsite than men (75% vs. 38%) and more likely than men to report experiencing unwanted sexual attention or sexual comments sometimes or often (41% vs. 6%).

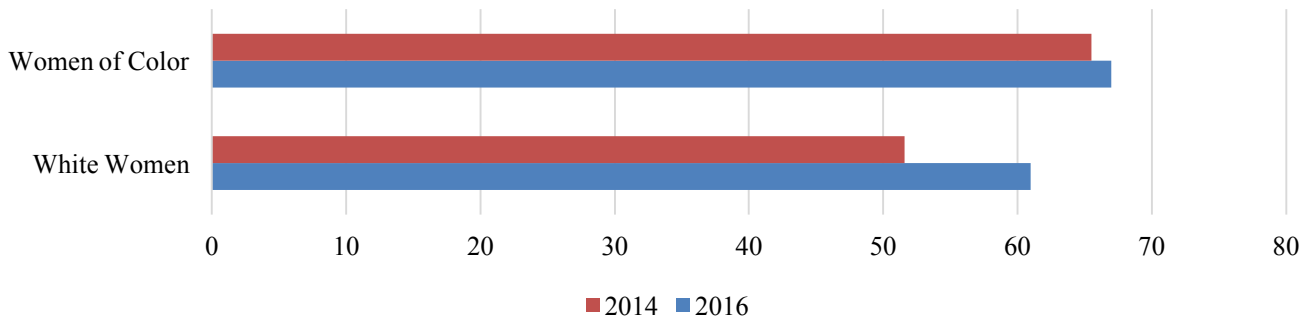
(2014 and 2016 Survey Data)

Figure 7. Percentage of Apprentices Reporting Any Form of Harassment or Discrimination Sometimes/Often on Job, by Year (2014 and 2015 Survey Data)



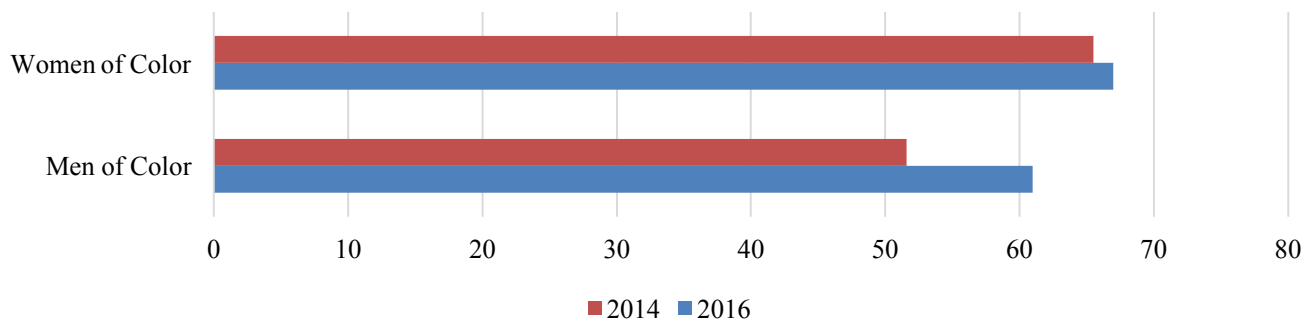
Reported rates of direct discrimination were also high in the 2016 survey. Among women surveyed in 2016, 67% of women of color and 60% of white women reported being discriminated against on the jobsite due to gender “sometimes” or “often,” which is a higher rate than was reported in the 2014 survey (Figure 8).

Figure 8. Percentage of Women Apprentices Reporting Discrimination Due to Gender, by Race and Year (2014 and 2016 Survey Data)



Racial/ethnic minorities were more likely than whites to report hearing negative comments or jokes about people of color, with women of color most likely of all race-gender groups to report hearing negative comments or jokes based on race/ethnicity (63%).

Figure 9. Percentage of Racial Minority Apprentices Reporting Discrimination Due to Race, by Gender and Year (2014 and 2015 Survey Data)



Among people of color surveyed, 35% of women of color and 30% of men of color reported experiencing discrimination based on race/ethnicity sometimes or often on the jobsite (Figure 9). In 2016, reported rates of jobsite discrimination based on race/ethnicity were not lower than those reported in 2014, suggesting that both gender- and race/ethnicity-based workplace discrimination continue to be a challenge for apprentices.

An important question added to the 2016 survey was how often respondents experienced discrimination on the jobsite due to being an apprentice (after participants in the 2014 survey described being discriminated against as an apprentice as an “other” form of discrimination).

Interestingly, while the majority of apprentices reported discrimination on the jobsite due to apprentice status (52%), this rate varied little across racial/ethnic groups. Although white men reported discrimination on the jobsite due to apprentice status at the lowest rate (48%), followed by white women (54%), men of color (54%), and women of color (58%), these differences are not large or statistically significant.

When asked to elaborate on the way they were discriminated against, participants offered a variety of experiences. Many participants reported hearing jokes and negative comments directed towards themselves or others; this sort of harassment indicates a hostile work environment. For example:

Jokes, and think they are just being funny, but they are kind of derogatory and they think it's not a big deal but it is. (African American male)

People would say “you are the wrong color to be in this training.” (Latino)

People would not let me do anything, and would talk about how they wanted to have sex with me or touch me inappropriately. Or they would say stuff like, “Oh, are you sure you can do it cause you're a girl?” It was mostly sexual jokes and attention, or sexual harassment.” (Native American female)

I spent days and weeks scrubbing penises off the wall. I was only allowed to use tools that had penises drawn on them. It was ridiculous; I would go home crying. It was just constant harassment. (white female)

Put in a situation where I was being screamed and yelled at, and put in an unsafe position. I was harassed quite a few times. (Native American female)

I am gay... and he called a customer a “dyke bitch.” And he knew that I was gay and I was standing right there.” (white female)

[I experienced] age discrimination. Just working for general contractors, and there are a lot of older guys that do not take me serious because I am younger than most of the guys. (Latino)

Because of my age, I was 45 going through the program. People saying “you are a 50 year old apprentice.” People thinking or saying I was not as physically fit as others because of my age. (white male)

They say women should not be in the trades, not fit for the job, and we cannot do what men can do. They have asked me if I have ever been a stripper, or if I am there just to find a husband. (white female)

There was a guy who thought I should not be in the program who belittled me in front of others who made me quit the job site. (white male)

[I experienced] being bullied a lot, treated like you were a nobody, a low person, an amoeba. (white male)

Some participants said that they were discriminated against, but they viewed this as a normal part of the apprenticeship experience. For example:

I think all apprentices felt that way though. Because that was just part of who we were. It was like picking on the little guy and I wouldn't necessarily call it discrimination, I expected that. (white female)

You're an apprentice, you're going to do the shit work. If there's a hole to dig, the apprentice is going to dig the hole. I wouldn't say it's discrimination, it's just part of earning your stripes, so to speak. (Latino)

You have to pay your dues as an apprentice. And you are treated as a rookie because you are one. (African American male)

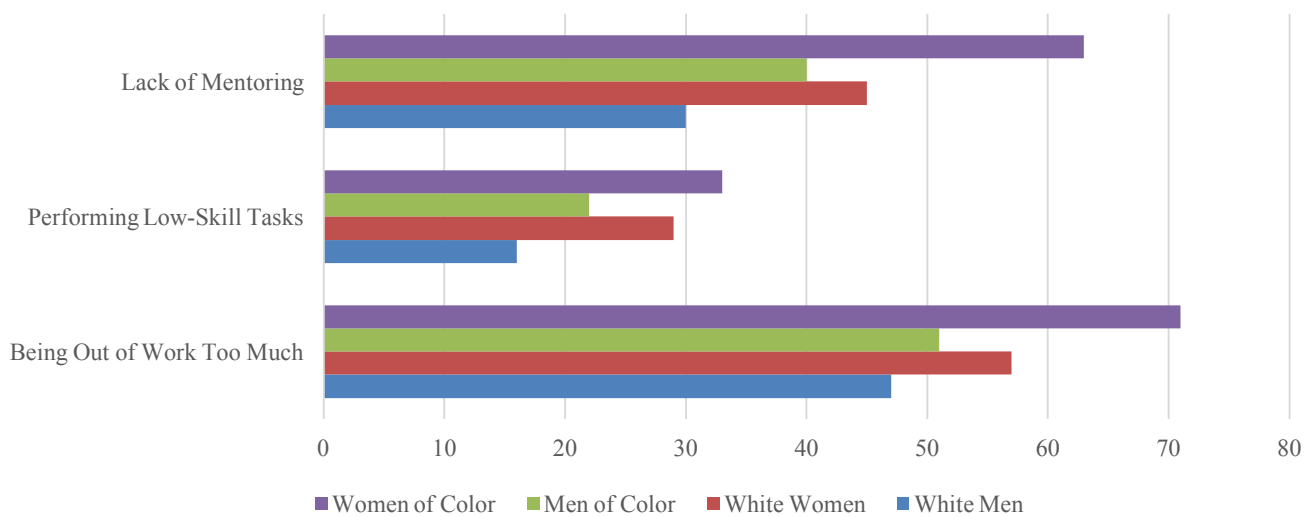
In sum, participants commonly reported discrimination or harassment based on gender, race/ethnicity, being an apprentice, as well as “other” discrimination, such as sexual identity and age (both being younger and older), as discussed later in the section on “reasons for leaving.” These experiences demonstrate that construction sites commonly represent hostile work environments for some workers. While women and

racial/ethnic minority were most likely to report experiences of harassment, white men also reported feeling disrespected at work. Issues related to a hostile work environment is negatively impacting the retention of apprentices, particularly racial/ethnic minority and female apprentices.

Lack of Work and Lack of Training

In the survey, apprentices noted 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). Notable, women of color and white women consistently reported these challenges at a higher rate than their male counterparts (Figure 10; Appendix E).

Figure 10. Percentage Reporting Challenge as a Major or Minor Problem, by Race and Gender (2016 Survey Data)



Apprentices were also asked if they were out of work for more than three months in the previous year. Overall, 49% of apprentices reported being out of work for more than three months. White men were the least likely (41%), followed by men of color (52%), white women (54%), and women of color (54%) to report being out of work for more than three months.

In open-ended questions on the survey, some apprentices also noted their race/ethnicity and/or gender resulted in a lack of access to informal networks, which in turn led to not being hired for jobs, being laid off first, or not getting as many hours of work. Some examples include:

Women just aren't hired as much. (white woman)

Not being able to get certain jobs, and they bragged about it and laughed about it like it was a funny thing that was happening. (African American male)

You would know when you were getting laid off even before you started based on your race. When you first started the job, you're the first person laid off due to your race. (Latino)

Getting laid off because people didn't think I could do the work. (Asian female)

I was always the first one to get sent home while the guys would get all the long hours. (African American female)

Participants reported being discriminated against based on their gender and/or race/ethnicity that affected the quality of their on-the-job training. This was particularly prevalent among female participants, many of whom reported hearing some variation on the idea that “women should not be in the trades.” For example:

[I was discriminated based on] my nationality, me being a woman. They pretty much don't let me do anything or teach me. For men, for the laborers, they expect the woman to cater to them, bring them donuts, bring them food, basically bend over backwards for them. (Native American female)

Because I'm a woman, they would assume that I'm either too weak, inexperienced, or too young. The owner, instead of making people treat me respectfully, he just separated me, which alienated me. It made it really, really hard to work. I'd just be by myself all the time. I'm not even supposed to be by myself because I'm an apprentice. My boss didn't trust anybody to work with me because of my gender. (Native American female)

Some people had preconceived notions before I started working for them. I could tell some companies were hesitant because they never had any women work for them and they were not sure of the capacity women have. (Latina)

Not being assigned skilled tasks. And when given the skilled tasks, not being shown how to properly do it. Often left to work alone. (African American male)

Some of the journeymen probably had a hard time as an apprentice. It felt like they were more interested in yelling at you and calling you names than teaching you. (Latino)

In sum, participants reported that discrimination based on gender and/or race/ethnicity affected their ability to find work and stay employed as well as the quality of their on-the-job training.

WORK EXPERIENCES FOLLOWING APPRENTICESHIPS 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. Choosing to leave an apprenticeship is much more common than being asked to leave an apprenticeship: of apprentices surveyed in 2016 who did not complete their apprenticeship, 90% reported choosing to leave, while only 10% reported being asked to leave. This is similar to results from the 2014 survey, where only 8.6% of those not completing reported being asked to leave. 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.

In the 2016 survey, 105 participants had left their apprenticeship without completing. When asked why they left (or were asked to leave) their apprenticeship, the most common responses (among those who gave a reason) were: being out of work too much or not making enough money (19 responses), finding a new job or going to college (15), harassment and discrimination (9), and physical demands of the job or injury (8). The following are some examples of apprentices' description of harassment and discrimination that led them to leave their apprenticeship:

[I left because of] who I was working with, the onsite foreman, who was not really professional in his trade. I did not feel like the environment I would like to continue. I wouldn't have imagined it would have been that bad. There was verbal abuse and back and forth yelling. I was turned off.
(white male)

I was the only female mechanic and I was constantly sexually harassed and discriminated against.
(white female)

[I was] tired of people talking down on me. When you are an apprentice, they treat you like shit. No matter how much history you have, you will never be treated as an equal. (Latino)

While results from the 2014 survey suggested a positive association between leaving an apprenticeship before completion and unemployment, results from 2016 survey data show equal rates of unemployment for those completing and those leaving before completing their most recent apprenticeship (12%) (Appendix F). Yet unemployment rates for those completing and leaving before completion vary dramatically by gender, with 45% of female apprentices leaving before completion compared to only 5% of male apprentices leaving before completion unemployed at the time of the 2016 survey. Among women, there are also differences in unemployment rates by completion: women who completed their most recent apprenticeship have a lower rate of unemployment than those who left before completion (33% vs. 45%).

Among apprentices who completed, 77% reported becoming journey workers, with a greater percentage of men than women who completed becoming journey workers (78% vs. 67%). Those who left before completion were more likely than those who completed to be working in construction in a capacity other than journey worker (33% vs. 7%) and much more likely to be working in a non-construction job (54% vs. 3%). Among those not completing, men of color are the most likely of all race-gender groups to be working in a non-construction job (69%).






PROGRESS TOWARDS THE GOALS OF THE HIGHWAY CONSTRUCTION WORKFORCE DEVELOPMENT PROGRAM

In the following section we identify progress toward goals established by ODOT/BOLI since the previous reporting period (2014). We highlight where progress has and has not been made and later offer recommendations for continued efforts at diversifying the skilled highway trades workforce. Appendix

H displays key performance measures for the previous (2014) and current (2016) reporting periods and indicates whether the policy goal set by ODOT/BOLI has been met and/or if progress is being made toward each goal. Key performance measures are divided into four key areas: outreach and recruitment, supportive services, workplace culture, and diversity of journey workforce.

Outreach and Recruitment

Since the previous reporting period, progress has been made and policy goals have been met for recruitment of both women and racial/ethnic minority apprentices in the highway construction trades. Among apprentices active in the most current reporting period (2014-2015), 21.5% were men of color, reaching the goal of having men of color comprise 20.6% of apprentices in highway construction trades. Also, 2.1% of new apprentices in 2014-2015 were women of color, reaching ODOT/BOLI’s goal of having women of color comprise 2% of highway construction trades apprentices. However, progress has stalled in the recruitment of white women apprentices: in the previous reporting period (2011-2013), white women comprised 6% of apprentices in the highway construction trades, yet white women comprised 5% of apprentices in the highway construction trade during the most recent reporting period.

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					
Percentage of newest cohort of apprentices in the highway construction trades (white women)	6.0%	5.0%	≥ 8.0%		
Percentage of newest cohort of apprentices in the highway construction trades (women of color)	1.5%	2.1%	≥ 2.0%		
Percentage of newest cohort of apprentices in the highway construction trades (men of color)	19.3%	21.5%	≥ 20.6%		







Supportive Services

In general, more eligible apprentices are aware of and are using ODOT/BOLI financial supportive services in the current reporting period compared to those in the previous period. Progress has been made on all measures, including the percentage of women and people of color in eligible trades aware that ODOT/BOLI supportive services exist and the percentage of women and people of color in eligible trades receiving services. Goals have been met for the percentage of white women in eligible trades aware that ODOT/BOLI supportive services exist, percentage of active apprentices in eligible trades who receive ODOT/BOLI financial supportive services, and percentage of women of color in eligible trades who receive ODOT/BOLI financial supportive services. Further progress needs to be made in making men and women of color more aware of supportive services and in encouraging men of color to use supportive services in order to reach goals set by ODOT/BOLI.

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
Supportive Services - Awareness and Use of Supportive Services					
Percentage of survey repondents in eligible trades who are aware that ODOT-BOLI supportive services exist (white women)	40.9%	52.0%	≥ 50.0%	✓	✓
Percentage of survey repondents in eligible trades who are aware that ODOT-BOLI supportive services exist (men of color)	33.9%	44.4%	≥ 50.0%		✓
Percentage of survey repondents in eligible trades who are aware that ODOT-BOLI supportive services exist (women of color)	28.6%	33.3%	≥ 50.0%		✓
Percentage of active apprentices working in eligible trades who receive ODOT-BOLI financial supportive services (white women)	18.2%	26.9%	≥ 25.0%	✓	✓
Percentage of active apprentices working in eligible trades who receive ODOT-BOLI financial supportive services (men of color)	17.5%	21.0%	≥ 25.0%		✓
Percentage of active apprentices working in eligible trades who receive ODOT-BOLI financial supportive services (women of color)	41.4%	52.2%	≥ 50.0%	✓	✓
Percentage of active apprentices in eligible trades receiving mentoring services (white women)	7.8%	5.5%	≥ 30.0%		✗
Percentage of active apprentices in eligible trades receiving mentoring services (men of color)	2.8%	2.0%	≥ 30.0%		✗
Percentage of active apprentices in eligible trades receiving mentoring services (women of color)	9.8%	4.3%	≥ 30.0%		✗

Workplace Culture

Continued effort needs to be made in changing perceptions of workplace culture for apprentices in the highway construction trades. Among white women and women of color, progress has not been made to lower the rate at which experiences of discrimination or harassment on the jobsite due to race/ethnicity or gender are reported. Some progress has been made, however, among men of color: while in the previous reporting period 35.1% of men of color reported experiencing discrimination or harassment due to race/ethnicity or gender, only 30.7% did so in the 2016 survey. While the apprentice survey is not generalizable across all apprentices in the highway construction trades, it is troubling that, particularly among women of color, reporting discrimination or harassment on the jobsite in our survey has increased since 2014. Progress also needs to be made in the percentage of apprentices who report any type of harassment or discrimination due to race/ethnicity, gender, apprentice status, or other reasons. In the 2016 survey, 80% of white women, 83% of women of color, and 60% of men of color reporting experiencing one or more forms of discrimination or harassment on the job site. It is important to note, however, that 50% of white men in the 2016 survey also reported experiencing discrimination or harassment due to their status as an apprentice, suggesting the need to change perceptions of workplace culture for all apprentices.

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
Workplace Culture - Experience of Discrimination or Harassment					
Percentage of survey respondents who report experiencing discrimination or harassment due to race or gender (white women)	68.7%	69.0%	≤ 17.1%		
Percentage of survey respondents who report experiencing discrimination or harassment due to race or gender (men of color)	35.1%	30.7%	≤ 17.1%		
Percentage of survey respondents who report experiencing discrimination or harassment due to race or gender (women of color)	65.5%	70.8%	≤ 17.1%		
Percentage of survey respondents who report experiencing any type of discrimination or harassment (white women)	69.0%	80.0%	≤ 50%		
Percentage of survey respondents who report experiencing any type of discrimination or harassment (men of color)	35.0%	60.0%	≤ 50%		
Percentage of survey respondents who report experiencing any type of discrimination or harassment (women of color)	66.0%	83.0%	≤ 50%		

Diversity of Journey Workforce

Recruitment and retention efforts appear to be paying off with greater diversity of new cohorts of apprentices in the highway construction trades and greater diversity of cohorts completing apprenticeship programs. However, we did not find an increase, yet, in completion rates of female and racial/ethnic minority apprentices. Completion is measured several ways in this report: percentage completing in six years, percentage of those not active (completed or terminated) completing, and race-gender distribution of completers in a given time period. For all apprentices in heavy highway construction trades, six-year completion rates declined between the previous and current reporting period. Among the 2005-2007 cohorts, 44.9% of white women completed within six years, and the same percentage of white women in the 2008-2009 cohorts completed within six years (43.5%). Similarly, six-year completion rates between the two periods remained stable among women of color, with 29.8% of previous cohorts completing in six years and 30.2% of more recent cohorts completing in six years. Among men of color, six-year completion rates declined from 41.6% in the previous reporting period to 35.6% in the current reporting period. Continued efforts need to be made to increase completion rates for women and apprentices of color to what they are for white men, or around 50%.

An additional measure of completion, one that enables measurement of more recent cohorts of apprentices, shows similar lack of progress in diversity of the workforce in the heavy highway construction trades. Completion rates for those terminated or completed declined between reporting periods, particularly among white women and women of color. Completion rates among those completed or terminated among white women in the previous reporting period was 54.7% yet declined to 36.3% in the most recent reporting period. For women of color, 41.9% of non-active apprentices in the previous reporting period completed, compared to 24.2% in the recent reporting period. Completion rates declined slightly among men of color between the two periods. As a percentage of apprentices completed in a given period,

however, we do seem progress among men of color: while in the previous reporting period (2011-13) 12.1% of those completing were men of color, this number increased to 18.8% in the current reporting period (2014-15).

Completing an apprenticeship and becoming a journey worker is an important milestone for apprentices. Survey data suggests white women and men of color who complete their apprenticeships are moving on to become journey workers at similar rates in 2014 and 2016, with additional progress needed to be made to meet the goals set by ODOT/BOLI.

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)	44.9%	43.5%	≥ 50%		✗
Six-Year Completion Rates (men of color)	41.6%	35.6%	≥ 50%		✗
Six-Year Completion Rates (women of color)	29.8%	30.2%	≥ 50%		✓
Completion rate among those completed or terminated (white women)	54.7%	36.3%	≥ 50%		✗
Completion rate among those completed or terminated (men of color)	51.9%	44.9%	≥ 50%		✗
Completion rate among those completed or terminated (women of color)	41.9%	24.2%	≥ 50%		✗
Percentage of completed (white women)	4.3%	4.0%	≥ 8.0%		✗
Percentage of completed (men of color)	12.1%	18.8%	≥ 20.6%		✓
Percentage of completed (women of color)	1.0%	1.0%	≥ 2.0%		✗
Percentage of survey repondents who completed their apprenticeship who are currently working in their trade as a journey worker (white women)	66.7%	67.0%	≥ 78%		✓
Percentage of survey repondents who completed their apprenticeship who are currently working in their trade as a journey worker (men of color)	82.6%	75.8%	≥ 78%		✗
Percentage of survey repondents who completed their apprenticeship who are currently working in their trade as a journey worker (women of color)	80.0%	No Data	≥ 78%		

RECCOMENDATIONS FOR INCREASING THE DIVERSITY OF THE CONSTRUCTION WORKFORCE

We provide several recommendations for increasing the diversity of the construction workforce, based on the data from this report, in conjunction with considering 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), and the Policy Group on Tradeswomen’s Issues (PGTI).

Continue Efforts to Recruit Diverse Workers into Apprenticeships

Currently, Oregon has the highest percentage of female representation among new apprentices in the U.S. with 7.1% women (5% white women, 2.1% women of color) as well as increasing representation of men of color (currently 21.5%). Oregon's goals for the 2014-2015 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.

An IWRP report (Hegewisch and O'Farrell 2015) notes that schools, career counselors, and job centers need to provide women information about the construction trades. The 2014 report on Oregon's Highway Construction Workforce Development Program noted that efforts should continue to recruit youth but more emphasis should be placed on workers in their 20s and 30s, as apprentices are more likely to be slightly older (Burd-Sharps et al. 2014). This continues to be the case; the current data shows that the average age that apprentices began their program was 28 (Appendix B). While efforts to reach youth, through vocational training in schools and programs targeted to youth, continue to be important; it will likely be more effective to target recruitment towards workers in their 20s and 30s who are most likely to begin an apprenticeship.

In Oregon, advocacy organizations (such as Oregon Tradeswomen, Inc. and Constructing Hope), contractors, apprenticeship programs, and unions are doing outreach in a variety of ways to disadvantaged workers. These efforts should be encouraged and supported by ODOT/BOLI.

The data from this report 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, 35% of women of color, 25% of white women, and 4% of men of color completed a pre-apprenticeship program prior to enrolling in an apprenticeship in eligible trades (ES Figure 5). 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.

Issues of work/family conflict in the construction trades may inhibit some parents from entering the trades (particularly, women and single parents of both genders, who are more likely to have caretaking responsibilities). In our survey, parents noted that both finding consistent childcare and the cost of childcare were a challenge. Additional efforts should be made to support parents during apprenticeship.

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.

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, 62% of survey respondents reported experiencing discrimination on the job (including discrimination based on gender, race/ethnicity, being an apprentice, and self-reported other forms of discrimination), 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 (as well as contributing to a number of other issues that impact workers and employers).

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).

Since the last study period, ODOT/BOLI began allocating funding from the Highway Construction Workforce Development Program to a project designed to promote respectful workplaces in the trades. This ongoing project is a partnership between Oregon Tradeswomen Inc, Constructing Hope, Green Dot Etcetera, and PSU researchers. The first phase of the project began in 2015 with focus groups with industry stakeholders to determine the feasibility of adapting the Green Dot bystander intervention program for the construction trades in Oregon (see Kelly and Bassett 2015). In 2016, the Green Dot program will be implemented on a pilot job site and evaluated by PSU researchers. If this program is effective in reducing harassment and discrimination on the pilot job site, the use of the program should be promoted throughout Oregon.

Ensure Equal Opportunities for Employment During Apprenticeship

Our data demonstrates disparities in accessing on-the-job training hours during apprenticeships. Women and people of color report more challenges in being out of work and were more likely to be unemployed for more than three months out of the last year (Figure 10, 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 varies by race-gender groups (Figure 2), but overall our data shows that fuel assistance

is the most helpful, followed by tools and clothing, childcare, and travel. 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.

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.³ Our data shows that the effect of non-financial services is *larger* than the effect of financial services. In the current study period, only 2% of apprentices in eligible trades received non-financial services, compared to 21.4% who received financial services. Given the effectiveness of these services, increasing funding for these programs would likely have an impact on retention.

Strengthen and Expand Pre-Apprenticeship Programs and Retention Services Throughout the State

As noted above, 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 organizations' services and programs related to ongoing retention may also be an effective use of funds.

In Oregon, pre-apprentice 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.

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).

Continue to Assess Ways to Use Highway Construction Workforce Development Program Funds Most Effectively

As more apprentices who have received services complete their apprenticeships, we will be able to provide better data on which services are most impactful on completion rates. We recommend a follow up survey in early 2018 to assess the 2016-2017 time period. This will allow for examining six-year completion rates

³ Cooper Zietz and Akana are the same entity

for cohorts of apprentices that began after the implementation of the Highway Construction Workforce Development Program.

In order to best use the funding allocated for evaluation of Highway Construction Workforce Development Program services, we suggest that medium and long term evaluation of some programs (i.e. pre-apprenticeship programs, the respectful workplaces initiative) be included in the biannual survey, rather than requiring evaluation with every project funded through ODOT/BOLI RFPs.

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 2015 (Appendix A), all apprentices in the 2005-2015 cohorts who did not cancel with zero credit hours accumulated were included (N=13639). For analysis of completion rates by receipt of ODOT/BOLI support services, all apprentices in the 2005-2015 cohorts in eligible trades who had completed or terminated by 2015 and who did not cancel with zero credit hours accumulated were included (N=3533).

For analyses of apprentices in the current reporting period (Appendix B), apprentices in the 2005-2015 cohorts active between January 1, 2014 and December 31, 2015 who did not cancel with zero credit hours accumulated were included. This included 6325 individual apprentices, including 455 (7%) women, 5870 (93%) men, 109 (1.7%) women of color, 340 (5.4%) white women, 1210 (33.3%) men of color, and 4656 (73.6%) 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 period (Burds-Sharp, Lewis, & Kelly 2014) were based on OAS data that covered the 2005 to 2013 cohorts (including 97 apprenticeship agreements initiated in the first month of 2014) 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. In the previous report, for apprentices with multiple agreements, only the most recent agreement was used.

To determine eligibility for ODOT/BOLI financial supportive services, we used information on apprentice trade. Apprentices in the following trades were considered eligible: carpenter, pile driver, cement mason, plasterer, ironworker, laborer, operating engineer, and painter.

Telephone Survey

Complementing OAS data, we collected interview data from a phone survey conducted between February 25th and March 9th, 2016 to assess the effectiveness of ODOT/BOLI support services and continued challenges faced by apprentices in the highway construction trades. Similar to the 2014 phone survey, the 2016 survey was conducted by the Portland State University Survey Research Lab. The survey reached

523 current and past apprentices of the 2005-2015 cohorts who were active between January 1, 2014 and December 31, 2015.

The 2016 survey had a response rate of 52 percent,⁴ and the average interview took 10.2 minutes to complete. The sample was stratified by receipt of ODOT/BOLI supportive services, gender, race/ethnicity, and trade, with an oversample of women and people of color and those receiving supportive services. Sample size and sample characteristics of the 2014 and 2016 surveys were quite similar on variables such as completion, gender, race/ethnicity, age, parental status, and education. The survey included respondents who did (23%) 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 that 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, 239 (46.1%) were men of color, 152 (29.3 %) were white men, 99 (19.1%) were white women, and 29 (5.6%) 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 and 2016

	2014 Survey	2016 Survey
% Currently enrolled/% completed/% left without completing	67/19/14	68/18/14
% Male/% Female	75/25	79/21
% White/% People of Color	48/52	45/55
Average age entering apprenticeship	30	29
% Married and living with spouse or cohabiting with partner	53	70
% With at least one child under age 18	51	48
% With at least one child under 5	30	31
% Completed high school or GED/% with a year or more of college/% with a year or more of trade school	88/43/16	95/42/14
% Received BOLI financial supportive services	21	23
Sample Size	519	523

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

⁴ A response rate of 51.6 percent reflects the number of completed interviews as a percentage of all resolved numbers. The response rate of completed interviews as a percentage of all eligible numbers was 26.4 percent.

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 alone.

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, 2014 and December 31, 2015 (N=2040) 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 2014 or 2015 and did not cancel with 0 credit hours (N=3147).
4. The percentage of apprentices in eligible trades (carpenter, cement mason, ironworker, laborer, operating engineer, or painter) active between January 1, 2014 and December 31, 2015 (N=2040) 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, 2014 and December 31, 2015 (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=245).
7. The percentage of all survey respondents (n=523) 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.” Only women were asked about discrimination due to gender and only racial/ethnic minorities were asked about discrimination due to race/ethnicity.
8. The percentage of all survey respondents (n=523) indicating they experienced discrimination due to being an apprentice.
9. The percentage of apprentices completing an apprenticeship by 2015 as a percentage of apprentices completed or terminated in the current reporting period (January 1, 2014 and December 31, 2015) (N=1925) (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=184) who were working as journey workers at the time of the survey. Data is not available for African-American women because no African-American female survey respondents had completed their apprenticeship 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=523).

APPENDIXES

Appendix A. Enrollment and Completion by Gender and Race/ethnicity, 2005-2015 Cohorts (OAS Data)							
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=1602)	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
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
<i>Source:</i> OAS data; includes all apprentices in 2005-2015 cohorts who did not cancel with zero credit hours accumulated							

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

Measures	Total	Men	Women	White Men	Men of Color	White Women	Women of Color
Bricklayer (%)	1	1	0	1	1	0	0
Carpenter (%)	14	14	22	12	22	20	27
Cement mason (%)	2	2	3	1	3	2	6
Electrician (%)	37	38	29	42	22	35	11
Ironworker (%)	4	4	3	4	6	4	1
Laborer (%)	6	6	10	5	11	7	19
Operating engineer or equipment operator (%)	3	2	4	2	3	5	4
Painter (%)	2	2	3	2	3	3	5
Plumber (%)	13	13	5	14	9	6	3
Sheet metal worker (%)	7	7	5	8	4	6	4
Other trade (%)	12	12	16	10	18	14	24
Eligible trade (%)	32	31	47	26	49	42	63
Average age at indenture	28	28	31	27	29	31	31
Completed high school or GED (%)	95	95	94	95	91	94	92
Completed some college (%)	40	39	58	40	35	61	49
Completed some vocational school (%)	14	14	19	14	12	19	21
Status Active (%)	68	68	65	68	65	66	64
Status Completed (%)	15	15	10	15	14	11	7
Status Terminated (%)	16	15	20	15	18	19	23
Received one or more ODOT/BOLI financial support services (% in eligible trades)	22	20	35	19	21	27	52
Service recipients with per diem support (%)	26	29	14	32	23	13	16
Service recipients with fuel support (%)	40	43	27	44	40	24	31
Service recipients with child care support (%)	13	12	19	13	11	13	24
Service recipients with support for tools/PPE (%)	83	82	89	80	86	87	91
Received social support services (%)	2	1	5	1	2	6	4
Completed a pre-apprenticeship (%)	5	2	28	1	4	25	35
N	6325	5870	455	4656	1210	340	109

Source: OAS data; includes all apprentices in 2005-2015 cohorts active in 2014-15 who did not cancel with zero credit hours accumulated

Appendix C. Apprentice Trade, Demographics, Status, and Use of BOLI-ODOT Services by Gender and Race (2016 Survey Data)

Measure	Total	Men	Women	White Men	Men of Color	White Women	Women of Color
Bricklayer (%)	0	0	0	1	0	0	0
Carpenter (%)	20	21	16	20	22	15	21
Cement mason (%)	2	2	3	1	3	2	4
Electrician (%)	28	27	29	27	27	34	8
Ironworker (%)	3	4	2	5	3	2	0
Laborer (%)	11	11	8	15	9	3*	25
Operating engineer or equipment operator (%)	2	2	4	4	1	3	4
Painter (%)	3	2	5	2	2	5	4
Plumber (%)	9	10	7	9	11	9	0
Sheet metal worker (%)	5	4	8	4	4	7	13
Other trade (%)	16	15	18	12	17	17	21
Eligible trade	44	45	41	49	43	36	58
Average age at indenture	29	29	31*	29	29	31	32
Completed high school or GED (%)	95	95	97	94	95	99	92
Completed some college (%)	42	37	62***	36	37	62***	63*
Completed some vocational school (%)	14	15	12	16	14	13	8
Household income (0-11)	3.6	3.6	3.6	4	3.4*	3.7	3.3
Married or living with partner (%)	63	64	61	67	62	62	58
Responsible for one or more children under 18 (%)	48	51	37**	51	51	34*	46
Responsible for one or more children under 5 (% those w/children)	64	66	54	77	60*	53*	55
Apprenticeship Status (%)							
Active	68	64	82***	45	75***	79***	92***
Completed	18	21	5***	36	13***	7***	0***
Terminated	14	15	13	19	12	14	8
Received one or more BOLI-ODOT financial services (% in eligible trades)	40	41	33	75	22***	21***	60
Service recipients with per diem support (%)	28	32	5*	36	25	11	0
Service recipients with fuel support (%)	41	43	30	44	42	33	27
Service recipients with child care support (%)	15	14	20	13	17	22	18
Service recipients with support for tools/PPE (%)	84	83	90	83	83	89	91
Received social support services (%)	2	2	6	0	2	9	0
Completed a pre-apprenticeship (%)	9	4	29***	4	4	24**	40***
N	523	412	111	148	264	87	24

Note: Differences between groups were tested using chi-square tests for categorical variables and t-tests for continuous variables. Significant differences are flagged as follows: *p<.05; **p<.01; ***p<.001

Appendix D. Apprenticeship Work Experience and Evaluation of Supportive Services by Gender and Race/ethnicity (2016 Survey Data)

Measure	Total	Men	Women	White Men	Men of Color	White Women	Women of Color
Spouse or partner works full time (% among those living with spouse or partner)	75	72	83	70	72	84	77
Child care arrangements (% among those needing child care)							
Spouse or partner	32	36	7**	37	36	7**	9
Unpaid friend or family member	17	15	29*	11	17	30*	27
Paid child care provider outside of home	26	26	24	31	23	20*	36
Paid child care provider within home	4	2	12**	4	1	17	0
Children old enough to take care of selves	12	11	15	8	13	10	27
Other arrangements	10	10	12	9	10	17	0
Work on a highway or bridge project during apprenticeship (%)	17	17	19	18	16	16	29
Worked out of town during apprenticeship (%)	75	79	61***	79	79	66*	46***
Social support evaluated as somewhat or very helpful (% participating in mentoring)	100	100	NA	NA	100	NA	NA
Per diem support evaluated as somewhat or very helpful (% receiving per diem)	100	100	100	100	100	100	NA
Fuel support evaluated as somewhat or very helpful (% receiving fuel support)	100	100	100	100	100	100	100
Child care support evaluated as somewhat or very helpful (% receiving child care)	100	100	100	100	100	NA	100
Support for tools/PPE evaluated as somewhat or very helpful	98	97	100	98	96	100	100
Agree ODOT/BOLI support services allowed them to take jobs they would otherwise would not have	70	67	84	62	77	88	81
Agree ODOT/BOLI support services allow them to complete apprenticeship	71	70	72	67	71	85	40
N	523	412	111	148	264	87	24

Note: Differences between groups were tested using chi-square tests for categorical variables and t-tests for continuous variables. Significant differences are flagged as follows: *p<.05; **p<.01; ***p<.001

Appendix E. Challenges Facing Apprentices by Gender and Race/ethnicity (2016 Survey Data)

Measure	Total	Men	Women	White Men	Men of Color	White Women	Women of Color
Identified as major/minor problem (%)							
Cost of childcare	53	51	65	44	55	73**	40
Finding consistent child care	35	32	53*	23	37*	60***	30
Being out of work too much	52	50	60*	47	51	57	71*
Performing low-skill tasks	22	20	30*	16	22	29*	33*
Lack of mentoring	39	36	49*	30	40	45*	63**
Finding reliable transportation	14	15	11	13	16	10	13
Paying for gas	41	41	41	35	44	40	42
Paying for food and lodging	34	36	25	30	39	25	27
Buying tools and equipment	54	52	60	39	60***	61**	58
Heard negative comments or jokes about people of color on the job sometimes/often (%)	44	42	50	30	49**	46*	63**
Experienced discrimination based on race or ethnicity on the job sometimes/often (%)	29	29	27	NA	30	NA	35
Heard negative comments or jokes about women on the job sometimes/often (%)	46	38	75***	36	39	74***	79***
Experienced unwanted sexual attention or sexual comments on the job sometimes/often (%)	13	6	41***	5	6	40***	46***
Experienced discrimination based on gender on the job sometimes/often (%)	62	NA	62	NA	NA	60	67
Experienced discrimination based on apprentice status sometimes/often (%)	52	52	54	48	54	53	58
Experienced any other form of discrimination sometimes/often (%)	14	12	21*	12	13	21	21
Experienced one or more forms of discrimination or harassment on job site sometimes/often (excludes discrimination due to being apprentice) (%)	37	27	71***	14	35***	70***	75***
Experienced one or more forms of discrimination or harassment on job site sometimes/often (includes discrimination due to being apprentice) (%)	62	57	81***	50	60*	80***	83**
N	523	412	111	148	264	87	24

Note: Differences between groups were tested using chi-square tests for categorical variables and t-tests for continuous variables. Significant differences are flagged as follows: *p<.05; **p<.01; ***p<.001

Appendix F. Apprenticeship Status and Experiences After Apprenticeship by Gender and race/ethnicity (2016 survey data)

Measure	Total	Men	Women	White Men	Men of Color	White Women	Women of Color
Status at time of survey							
Active (%)	68	64	82***	45	75***	79***	92***
Completed (%)	18	21	5***	36	13***	7***	0***
Terminated (%)	14	15	13	19	12	14	8
Working as journey worker	77	78	67	79	76	67	NA
(% of completed)	77	78	67	79	76	67	NA
(% terminated)	1	2	0	4	0	0	NA
Working in construction but not journey worker	18	20	6	23	16	6	NA
(% of completed)	7	8	0	11	3	0	NA
(% of terminated)	33	38	9	44	31	9	NA
Unemployed (% of non-active)	12	8	41***	8	10	41***	0
(% of completed)	12	10	33	6	18	33	NA
(% of terminated)	12	5	45	11	0	45	NA
Working in non-construction job (% of non-active)	25	24	29	16	34*	29	0
(% of completed)	3	3	0	4	3	0	NA
(% of terminated)	54	55	45	41	69	45	NA
Chose to leave (% of terminated)	90	89	94	80	97	92	100
Asked to leave (% of terminated)	10	11	6	20	3	8	0
N	523	412	111	148	264	87	24












Note: Differences between groups (men and white men are reference) were tested using chi-square tests for categorical variables and t-tests for continuous variables. Significant differences are flagged as follows: *p<.05; **p<.01; ***p<.001

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	266	28	110	65	63
2	Percentage in eligible trades completing pre-apprenticeship program	OAS data	9	4	24	4	40
3	Percentage distribution of newest cohort of apprentices in the heavy highway trades [2014-2015 cohorts]	OAS data	100	72	5	21	2
4	Percentage of active apprentices working in eligible trades who receive BOLI financial supportive services	OAS data	22	19	27	21	52
5	Percentage of active apprentices working in eligible trades who received BOLI mentoring services	OAS data	2	1	6	2	4
6	Percentage of survey respondents in eligible trades aware that BOLI supportive services exist	Apprentice survey data	46	53	52	44	33
7	Percentage of survey respondents who report experiencing gender/race discrimination or sexual harassment	Apprentice survey data	32	5	69	31	71
8	Percentage of survey respondents who report experiencing discrimination due to apprenticeship status	Apprentice survey data	52	48	53	54	58
9	Completion rate among those completed or terminated	OAS data	48	51	36	45	24
10	Percentage of respondents who completed their apprenticeship who are now journeyworkers	Apprentice survey data	77	79	67	76	NA
11	Percentage of apprentices reporting that they have been out of work for more than three months in the past year	Apprentice survey data	49	41	54	52	54

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					
Percentage of newest cohort of apprentices in the highway construction trades (white women)	6.0%	5.0%	≥ 8.0%		
Percentage of newest cohort of apprentices in the highway construction trades (women of color)	1.5%	2.1%	≥ 2.0%	✓	
Percentage of newest cohort of apprentices in the highway construction trades (men of color)	19.3%	21.5%	≥ 20.6%	✓	
Supportive Services - Awareness and Use of Supportive Services					
Percentage of survey respondents in eligible trades who are aware that ODOT-BOLI supportive services exist (white women)	40.9%	52.0%	≥ 50.0%	✓	
Percentage of survey respondents in eligible trades who are aware that ODOT-BOLI supportive services exist (men of color)	33.9%	44.4%	≥ 50.0%		
Percentage of survey respondents in eligible trades who are aware that ODOT-BOLI supportive services exist (women of color)	28.6%	33.3%	≥ 50.0%		
Percentage of active apprentices working in eligible trades who receive ODOT-BOLI financial supportive services (white women)	18.2%	26.9%	≥ 25.0%	✓	
Percentage of active apprentices working in eligible trades who receive ODOT-BOLI financial supportive services (men of color)	17.5%	21.0%	≥ 25.0%		
Percentage of active apprentices working in eligible trades who receive ODOT-BOLI financial supportive services (women of color)	41.4%	52.2%	≥ 50.0%	✓	
Percentage of active apprentices in eligible trades receiving mentoring services (white women)	7.8%	5.5%	≥ 30.0%		
Percentage of active apprentices in eligible trades receiving mentoring services (men of color)	2.8%	2.0%	≥ 30.0%		
Percentage of active apprentices in eligible trades receiving mentoring services (women of color)	9.8%	4.3%	≥ 30.0%		
Workplace Culture - Experience of Discrimination or Harassment					
Percentage of survey respondents who report experiencing discrimination or harassment due to race or gender (white women)	68.7%	69.0%	≤ 17.1%		
Percentage of survey respondents who report experiencing discrimination or harassment due to race or gender (men of color)	35.1%	30.7%	≤ 17.1%		
Percentage of survey respondents who report experiencing discrimination or harassment due to race or gender (women of color)	65.5%	70.8%	≤ 17.1%		
Percentage of survey respondents who report experiencing any type of discrimination or harassment (white women)	69.0%	80.0%	≤ 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)	44.9%	43.5%	≥ 50%		
Six-Year Completion Rates (men of color)	41.6%	35.6%	≥ 50%		
Six-Year Completion Rates (women of color)	29.8%	30.2%	≥ 50%		
Completion rate among those completed or terminated (white women)	54.7%	36.3%	≥ 50%		
Completion rate among those completed or terminated (men of color)	51.9%	44.9%	≥ 50%		
Completion rate among those completed or terminated (women of color)	41.9%	24.2%	≥ 50%		
Percentage of completed (white women)	4.3%	4.0%	≥ 8.0%		
Percentage of completed (men of color)	12.1%	18.8%	≥ 20.6%		
Percentage of completed (women of color)	1.0%	1.0%	≥ 2.0%		
Percentage of survey repondents who completed their apprenticeship who are currently working in their trade as a journey worker (white women)	66.7%	67.0%	≥ 78%		
Percentage of survey repondents who completed their apprenticeship who are currently working in their trade as a journey worker (men of color)	82.6%	75.8%	≥ 78%		
Percentage of survey repondents who completed their apprenticeship who are currently working in their trade as a journey worker (women of color)	80.0%	No Data	≥ 78%		NA

Appendix I. Apprentice Trade, Demographics, Status, and Use of BOLI-ODOT Services by Gender and Race (OAS Data, All Apprentices in 2005-2015 Cohorts)

Measures	Total	Men	Women	White Men	Men of Color	White Women	Women of Color
Bricklayer (%)	1%	1%	0%	1%	1%	0%	0%
Carpenter (%)	15%	14%	21%	13%	21%	19%	26%
Cement mason (%)	2%	2%	3%	1%	3%	2%	5%
Electrician (%)	36%	36%	27%	39%	21%	32%	12%
Ironworker (%)	5%	5%	2%	4%	7%	3%	1%
Laborer (%)	8%	7%	16%	6%	15%	12%	27%
Operating engineer or equipment operator (%)	3%	2%	6%	2%	2%	7%	5%
Painter (%)	3%	3%	6%	2%	4%	5%	6%
Plumber (%)	12%	13%	5%	14%	8%	6%	3%
Sheet metal worker (%)	6%	6%	5%	7%	4%	6%	4%
Other trade (%)	12%	12%	12%	11%	17%	11%	17%
Eligible trade (%)	35%	31%	53%	29%	53%	49%	69%
Average age at indenture	28	28	32	28	29	32	32
Completed high school or GED (%)	92%	33%	93%	93%	89%	93%	92%
Completed some college (%)	37%	35%	54%	36%	33%	55%	50%
Completed some vocational school (%)	15%	15%	21%	15%	15%	19%	27%
Status Active (%)	31%	31%	32%	31%	34%	32%	32%
Status Completed (%)	35%	36%	24%	38%	28%	25%	19%
Status Terminated (%)	33%	33%	42%	31%	38%	41%	47%
Received one or more BOLI-ODOT financial support services (% in eligible trades)	5%	4%	13%	3%	8%	9%	23%
Service recipients with per diem support (%)	1%	1%	3%	1%	2%	2%	5%
Service recipients with fuel support (%)	2%	2%	4%	2%	3%	3%	8%
Service recipients with child care support (%)	1%	1%	2%	0%	1%	1%	6%
Service recipients with support for tools/PPE (%)	4%	3%	11%	3%	6%	7%	21%
Received social support services (%)	1%	1%	4%	0%	1%	4%	4%
Completed a pre-apprenticeship (%)	1%	0%	13%	0%	1%	12%	16%
N	13639	12705	934	10350	2355	711	223

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