

WSDOT Equity Study

Prepared by the Center for Economic and Business Research

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About the Authors

The Center for Economic and Business Research is an outreach center at Western Washington University located within the College of Business and Economics. In addition to publishing the Puget Sound Economic Forecaster, the Center connects the resources found throughout the University to assist for-profit, non-profit, government agencies, quasi-government entities, and tribal communities in gathering and analyzing useful data to respond to specific questions. We use a number of collaborative approaches to help inform our clients so that they are better able to hold policy discussions and craft decisions.

The Center employs students, staff, and faculty from across the University as well as outside resources to meet the individual needs of those we work with. Our work is based on academic approaches and rigor that not only provides a neutral analytical perspective but also provides applied learning opportunities. We focus on developing collaborative relationships with our clients and not simply delivering an end product.

The approaches we utilize are insightful, useful, and are all a part of the debate surrounding the topics we explore; however, none are absolutely fail-safe. Data, by nature, is challenged by how it is collected and how it is leveraged with other data sources. Following only one approach without deviation is ill-advised. We provide a variety of insights within our work – not only on the topic at hand but also the resources (data) that inform that topic.

We are always seeking opportunities to bring the strengths of Western Washington University to fruition within our region. If you have a need for analysis work or comments on this report, we encourage you to contact us at 360-650-3909 or by email at cebr@wwu.edu.

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The Center for Economic and Business Research is directed by Hart Hodges, Ph.D. and James McCafferty.

Executive Summary

The Washington State Department of Transportation (WSDOT) tasked the Center for Economic and Business Research (CEBR) with broadly exploring the overall equity of the agency's operations. The four key areas for consideration in this equity study are: land acquisitions, investments in highway construction, employee recruitment and compensation, and general industry trends in benefits distribution.

The goal of this study is to serve as a starting point for future research and exploration of equity within WSDOT, rather than to provide concrete answers or next steps. Throughout the report, we will highlight key literature on transportation equity and best practices. Data provided by WSDOT further illuminates areas for improvement and future research.

Report Structure and Key Questions

In designing this project, WSDOT has four key questions surrounding the equity of the agency and its operations. The following report is organized into four distinct sections to address each of these questions:

- Question 1 – Equitable Compensation in Property Acquisition
 - Is WSDOT offering equitable value based on surrounding land values during the right of way and condemnation process?

- Question 2 – Equity of Highway Construction Program Investments
 - Are investments being made equitably?
 - Where are the investments being made? Where are they not being made?

- Question 3 – Workforce Representation
 - Is the WSDOT workforce demographically reflective of the communities they serve?
 - Are WSDOT's wages equitable when compared internally and externally?

- Question 4 – Distribution of Benefits for Transportation Investments
 - What value and benefits do different income and racial groups receive from transportation system investments?

Summary of Findings

Below is a brief summary of the key findings from each of the four report sections. More detailed methodology, analysis, findings, and recommendations for further research can be found within the body of the report.

Question 1 – Equitable Compensation in Property Acquisition

- On average, WSDOT pays less per square foot than private buyers within ½ mile
- However, the land WSDOT purchases tends to be of significantly lower assessed value than the average property within ½ mile
- This suggests that WSDOT is paying more for their acquisitions than the expected sales price in the private market
- **Note:** this analysis considers a limited set of data and is unable to account for the wide range of variables needed to conduct a true property valuation

Question 2 – Equity of Highway Construction Program Investments

- Income Patterns:
 - Household incomes within ½ mile of WSDOT points of improvement are significantly lower than those within a 2-mile radius
 - This is likely a product of lower property values near major infrastructure
- Demographic Patterns:
 - Unlike income patterns, the analysis found no significant difference in the prevalence of communities of color between the ½ mile and 2-mile buffers
- These results likely do not show a bias by WSDOT, but rather reflect structural and historical factors which have pushed lower-income households into less-desirable land near major roads and highways

Question 3 – Workforce Representation

- Part 1 – Demographic Representation
 - When looking at applicants and new hires, the WSDOT region that hires the most people of color and has the highest number of applicants of color is the Northwest region. The region with the lowest number of applicants of color and new hires is the Eastern region.
 - For female applicants and new hires, the regions on the Western side of the state have the highest numbers for both.
 - In addition, the Northwest region had the highest starting salaries for new hires. However, more analysis may be needed to determine the differences in starting positions across the regions.

- Part 2 – Literature Review on Recruitment
 - Reviewed literature from consulting companies, public agencies, blogs, and universities on the best recruitment practices to foster a diverse workforce and compared to WSDOT’s recruitment and hiring practices.
 - An overview of WSDOT’s recruitment process shows a commitment to building a diverse workforce. The Human Resources Department has demonstrated a strong implementation of the recruitment practices discussed in the literature. Although there is significant room for improvement, current metrics are showing promising progress.
 - There are multiple key factors identified in the literature that WSDOT has policies to address. These include use of social media for marketing and outreach, decreasing the time to fill for open positions, marketing to individuals with disabilities, and mandatory agency-wide trainings.
 - Moving forward, WSDOT could consider continuing to decrease the average time to fill for the agency, transition from a transactional to consultative recruitment process, reduce the difference between diverse applicants and diverse new hires, update the language in job postings and descriptions, and develop retention strategies.

- Part 3 – Analysis of Compensation
 - For new WSDOT hires in many job codes, the median base salary was less than the average entry-level wage of similar jobs in the region.
 - This was most prevalent in WSDOT’s Eastern and North Central regions
 - Average new-hire salaries were \$2,552 higher for women than men and \$1,764 higher for the hiring of people of color compared to White hires.
 - After accounting for job codes, there is no clear pattern of over or underpayment by race or gender.
 - The data does not show any patterns of over or under payment by demographic group. Disaggregated by region, there were a significant number of sectors within the agency that had median compensation levels below the average, regional, entry-level salary.
 - The Northwest Region has significantly higher starting salaries compared to the other five regions in the state.
 - Based on cost-of-living data, the North Central Region has a higher average income than expected. The Southwest and Olympic Regions has lower than expected average income based on cost-of-living data.

Question 4 – Distribution of Benefits for Transportation Investments

- Investments are becoming highly car-based which is disadvantageous to low-income individuals that are unable to afford a vehicle.
- Active transportation can fill gaps in transportation; however, investment is not always placed equitably for those who use public transportation the most (low income and communities of color).
- Highway infrastructure investment may aid in decreasing income inequality.
- Light rail investments are mainly used by higher income, White individuals, thus leading to gentrification of surrounding neighborhoods, despite goals to improve access to public transportation.
- Equitable transportation planning involves community involvement and incorporating multiple forms of transit.

Question 1 – Equitable Compensation in Property Acquisition

The goal of this section is to examine the equity of WSDOT’s compensation for property acquisitions. For instance, consider the owner of a piece of land. If the owner lists that piece of land, how much would they make in the private market? How does this compare to what WSDOT would offer for that same piece of land? In an equitable scenario, WSDOT would pay the market value of the land.

It is important to note that property valuation is a complex process that involves many variables that were not able to be incorporated into this analysis. Instead, this modeling considers a series of three difference equations. These equations compare WSDOT’s compensation of property owners to nearby private transactions and the assessed value of the properties. All comparisons are made in dollars-per-square-foot terms to standardize the data.

Based on the modeling used in this report, we find that WSDOT’s compensation of property owners may be greater than what a private buyer would be willing to pay. Various factors, including small sample sizes and limited variables may be able to explain these differences.

Methods

Using WSDOT, Northwest Multiple Listing Service (NWMLS), and assessor’s data, we compared values in standardized, dollars-per-square-foot terms. This was done using three equations:

Equation 1: Comparing WSDOT purchase prices to nearby (½ mile) private transactions

$$[(\text{WSDOT Purchase Price} - \text{Nearby Purchase Price}) / \text{Nearby Purchase Price}] * 100$$

Equation 2: Comparing the assessed value of WSDOT purchases to nearby (½ mile) land values

$$[(\text{WSDOT Assessed Value} - \text{Nearby Assessed Value}) / \text{Nearby Assessed Value}] * 100$$

Equation 3: Comparing the difference in purchase prices to the difference in assessed values

$$[\text{Equation 1} - \text{Equation 2}]$$

To make the data comparable, a few tools were used within ArcGIS Pro. After joining the WSDOT data to the parcels and the private real estate data to block groups, the compensation or value of land was divided by the square footage of the land obtained. For private real estate data, lands purchased were included if they were within a half mile of a parcel that WSDOT purchased.

Results

Findings from this analysis do not suggest any systemic equity issues in WSDOT’s compensation of property owners. Again, it should be noted that this analysis only considers three datapoints – WSDOT purchase price, private land transactions, and assessed value. A more accurate valuation would take into consideration many other factors that were not available to this research team.

When considering both partial-parcel and full-parcel acquisitions, we see that WSDOT tends to pay less than nearby private transactions (Column 3), but that the land WSDOT purchases tends to be of significantly lower value than nearby private transactions (Column 6). Ultimately, WSDOT on average paid more than the private market in 9 of 14 instances (Column 7).

For an example of interpreting the table below, consider Clark County in 2019. On average, WSDOT paid 48 percent less per square foot than nearby private transactions (Column 3). However, the land being purchased had an average assessed value 77 percent lower than nearby private transactions (Column 6). Subtracting Column 6 from Column 3 shows a 29 percentage point difference (Column 7). This means that, on average, WSDOT is likely to have paid more than a private buyer would have.

Table 1: Summary of Outputs by Year and County (Partial and Full Parcel Acquisitions)

	Averages (\$/sf) Including Partial and Total WSDOT Acquisitions	(1) Average WSDOT Purchase Price	(2) Average Nearby Private Transaction	(3) Average Difference: WSDOT vs. Nearby Private Transaction Price	(4) Average WSDOT Assessed Value	(5) Average Nearby Private Transaction Assessed Value	(6) Average Difference: WSDOT vs. Nearby Private Transaction Assessed Value	(7) Column 3 minus Column 6
2020-2021	King	\$84.08	\$120.97	-33%	\$292.32	\$95.08	59%	-92%
	Pierce	\$11.22	\$20.51	-40%	\$9.17	\$17.11	-62%	21%
	Thurston	\$10.31	\$83.75	-67%	\$0.68	\$28.25	-98%	30%
	Whatcom	\$33.76	\$212.97	-55%	\$2.49	\$37.42	-93%	39%
2019	Clark	\$12.00	\$23.04	-48%	\$3.77	\$16.41	-77%	29%
	King	\$143.45	\$165.30	-22%	\$61.58	\$141.89	-50%	28%
	Pierce	\$9.56	\$25.47	-59%	\$6.92	\$26.56	-74%	15%
	Thurston	\$7.31	\$80.54	-91%	\$0.10	\$36.69	-100%	9%
2018	Clark	\$10.16	\$35.61	-71%	\$4.75	\$36.00	-87%	16%
	Cowlitz	\$8.06	\$31.01	-64%	\$6.81	\$17.52	-50%	-15%
	King	\$17.51	\$117.91	-83%	\$33.44	\$98.60	-67%	-15%
	Kitsap	\$22.34	\$66.22	-62%	\$57.21	\$37.60	51%	-113%
	Pierce	\$8.64	\$53.62	-81%	\$4.60	\$62.76	-93%	12%
	Thurston	\$5.91	\$64.47	-90%	\$4.03	\$15.33	-73%	-17%

Looking only at WSDOT’s full-parcel acquisitions shows slightly different trends. It is important to note here that WSDOT makes far more partial-parcel acquisitions, so the sample sizes in this analysis are small. In this table, we see that WSDOT occasionally pays more on average than private buyers; however, the land WSDOT buys consistently is of lower value than the surrounding area on average. In all but one case – Cowlitz County in 2018 – WSDOT is estimated to have paid more on average than a private buyer.

Table 2: Summary of Outputs by Year and County (Full Parcel Acquisitions)

Averages (\$/sf) Excluding Partial WSDOT Acquisitions	(1) Average WSDOT Purchase Price	(2) Average Nearby Private Transaction	(3) Average Difference: WSDOT vs. Nearby Private Transaction Price	(4) Average WSDOT Assessed Value	(5) Average Nearby Private Transaction Assessed Value	(6) Average Difference: WSDOT vs. Nearby Private Transaction Assessed Value	(7) Column 3 minus Column 6	
2020-2021	King	\$277.93	\$105.97	67%	\$20.53	\$87.92	-85%	153%
	Pierce	\$56.90	\$28.56	99%	\$51.20	N/A	N/A	N/A
	Whatcom	\$33.76	\$212.97	-55%	\$2.49	\$37.42	-93%	39%
2019	King	\$290.14	\$188.87	59%	\$19.43	\$166.54	-76%	136%
	Pierce	\$14.30	\$23.20	-33%	\$2.81	\$23.40	-88%	55%
2018	Clark	\$10.16	\$35.61	-71%	\$4.75	\$36.00	-87%	16%
	Cowlitz	\$13.35	\$25.35	-39%	\$12.24	\$13.33	-8%	-31%
	King	\$46.75	\$96.22	-42%	\$7.77	\$73.99	-92%	51%
	Pierce	\$9.75	\$58.34	-78%	\$5.20	\$68.68	-92%	14%

Question 2 – Equity of Highway Construction Program Investments

This section explores whether WSDOT’s highway construction program investments are being made equitably. The goal is to understand the demographics of those who benefit from these investments and those who experience more of the negative impacts.

Looking at income, those living within ½ mile of WSDOT’s highway construction projects have significantly lower incomes than those living within 2 miles of the project. These differences are smaller in more densely populated areas and more pronounced in rural areas.

In contrast, the modeling suggests that there is a similar presence of communities of color within ½ mile and 2 miles of WSDOT’s highway construction projects. This indicates that the benefits and costs of WSDOT’s projects are not disproportionately distributed based on race, at least within the defined 2-mile radius.

Methods

For question two, the main goal was to understand and analyze the demographics of people living near WSDOT’s recent points of improvement. To do this, we ran the same analysis for income and race/ethnicity within ½ a mile and 2 miles of a point of improvement.

Within ArcGIS Pro, waterways were removed from the block group layer, since they were not needed for analysis. A half mile buffer or a 2-mile buffer was then created around each improvement point. Using the union tool, we connected these buffer areas with block groups. This allowed the calculation of subareas (the area of buffers within block groups) and the resulting weight (Area / Subarea).

This weight calculation allows for the construction of weighted values for each buffer-block group area. The displayed values were calculated by multiplying these weights by the corresponding demographic characteristics of the region.

To calculate the difference in income between ½ a mile and 2 miles, the following formula was used for both differences in weighted average income and the percentage of communities of color in the buffers:

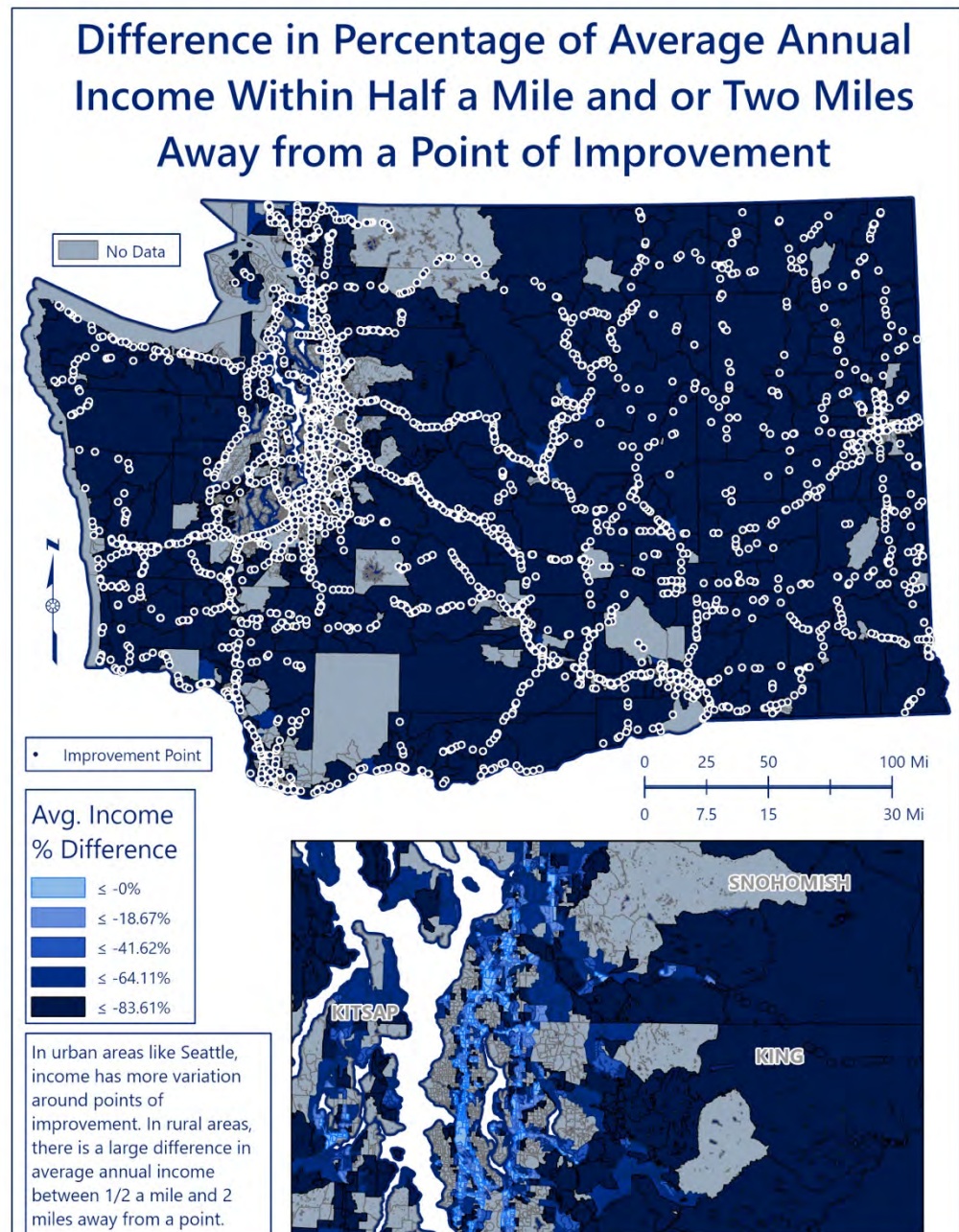
$$100 * ([\textit{weighted avg. within ½ mile}] - [\textit{weighted avg. within 2 miles}]) / (\textit{weighted avg. within 2 miles})$$

Income

Our findings indicate that points of improvement are being made mainly near areas with higher concentrations of low-income individuals. This is a likely result of lower property costs near major roads, highways, and other infrastructure.

In Washington's largest metropolitan areas – Snohomish, King, Clark, and Spokane – these disparities between buffers were the smallest. This may be a product of high density and high demand keeping property values more uniform regardless of proximity to infrastructure. In less populated counties across eastern Washington, average incomes were more than 80% lower within ½ mile of the improvement compared to incomes within a 2-mile radius.

Figure 1: Difference in average household income by proximity to WSDOT improvement

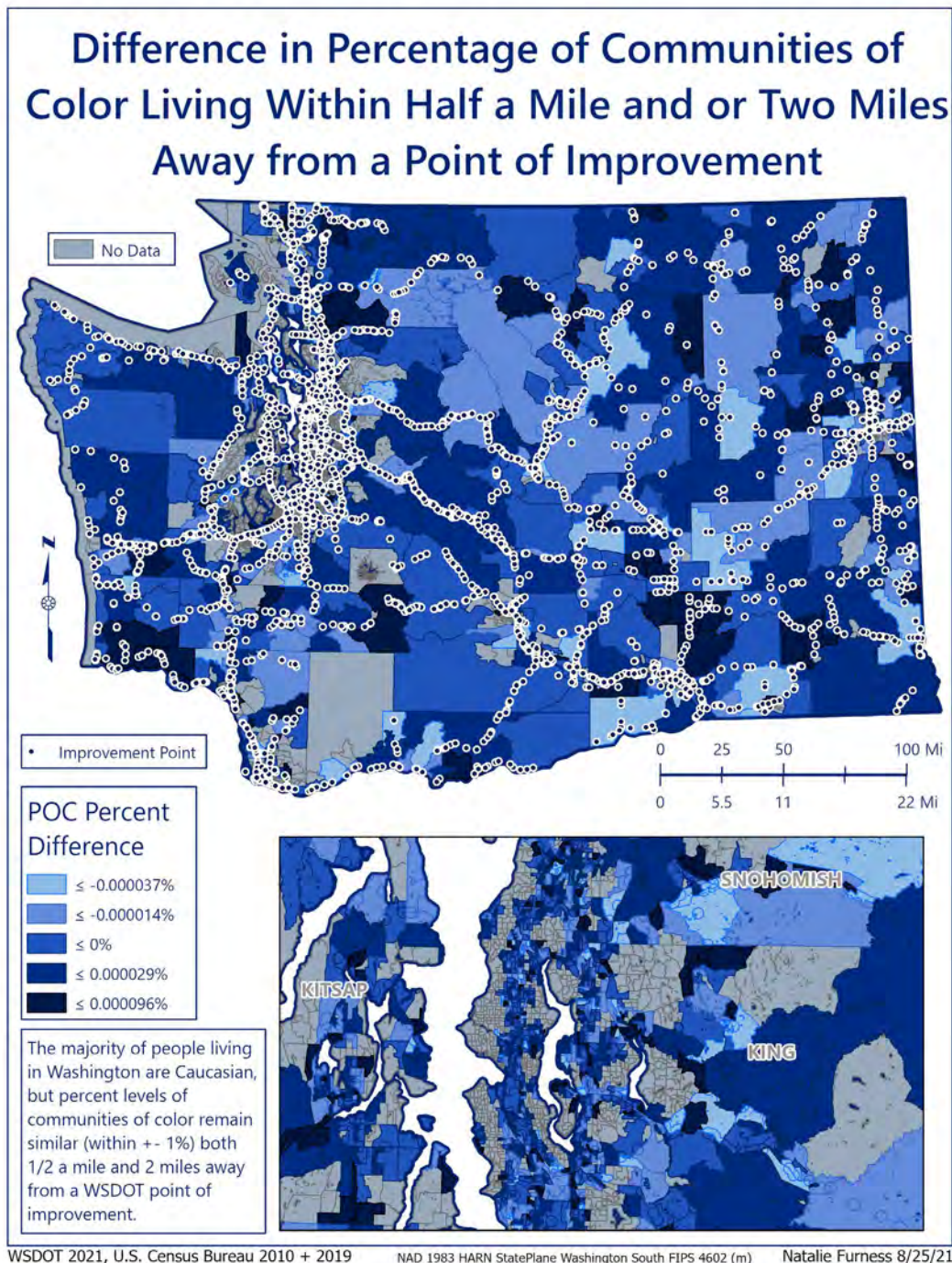


WSDOT 2021, U.S. Census Bureau 2010 + 2019 NAD 1983 HARN StatePlane Washington South FIPS 4602 (m) Natalie Furness 8/25/21

Communities of Color

When comparing the percentage of communities of color within ½ mile and 2 miles of a WSDOT improvement, differences are negligible. This contrasts with the substantial differences in income seen between the two buffers and suggests that these improvements do not have a disproportionate positive or negative impact on communities of color.

Figure 2: Showing difference (%) between POC ½ mile and 2 miles from points of improvement

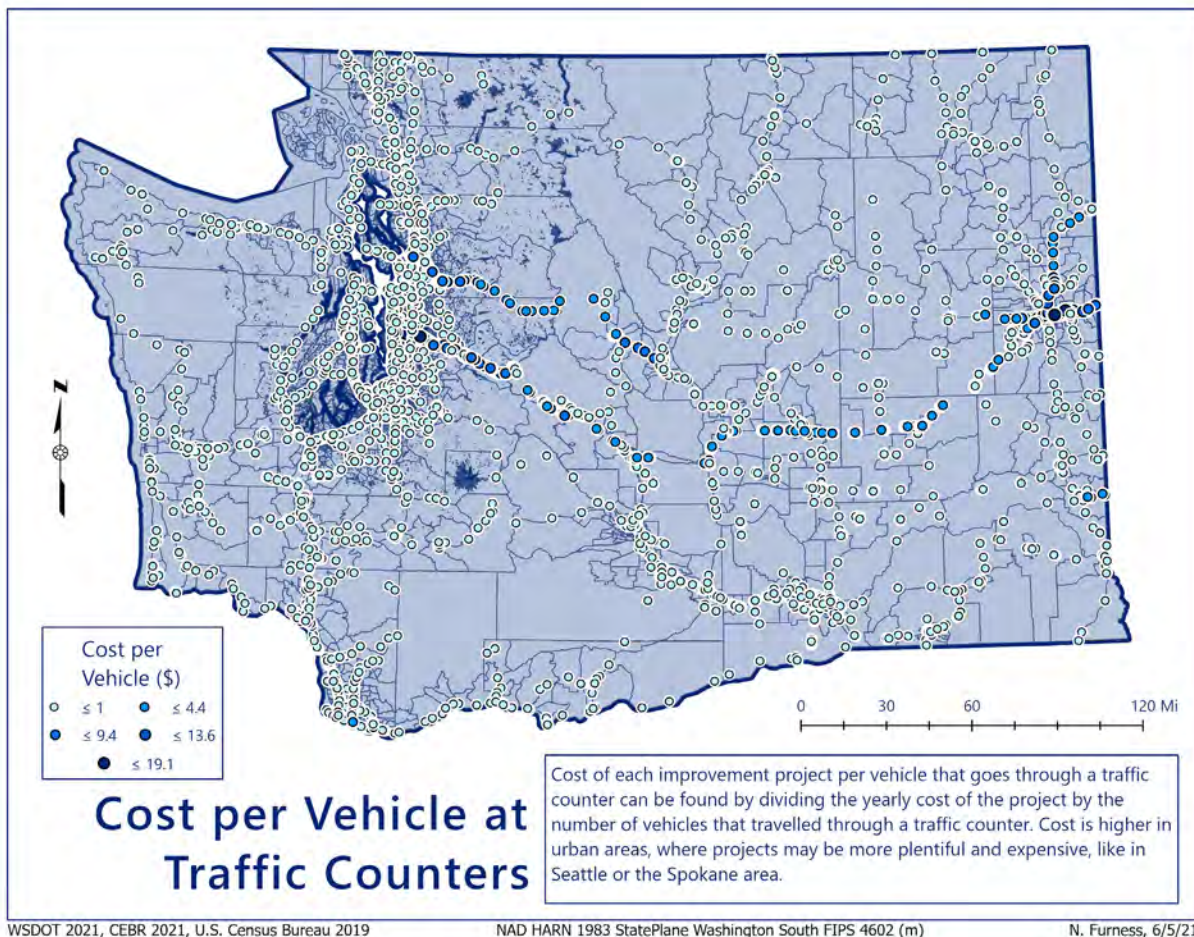


Cost Per Vehicle

Our findings imply that WSDOT's highway construction projects are generally low cost on a one-year, per-vehicle basis. The points with higher costs could imply that either the investments are costly or that those points of improvement are being made in areas that do not get as much traffic. For some of the points in central Washington, for example, this could be an example of the road not being used as frequently, since they are further from the city and population in those areas is much smaller. In Seattle, the concentration of traffic counters and traffic is much higher, which may be why cost per vehicle is low.

This map indicates that the cost of each improvement project per vehicle (in a 1-year timeframe) for most traffic counters is less than \$1.¹ Costs per vehicle are higher in Spokane, Seattle, and parts of the major roadways between. There are only a few improvement points with a high cost per vehicle (\$13.60-\$19.10), and they are in the center of the Seattle and Spokane areas.

Figure 3: Map showing cost per vehicle at traffic counters



¹ Based on the traffic count data provided by WSDOT.

Question 3 – Workforce Representation

This section of the report explores the question of equity through the lens of WSDOT’s workforce.

Analysis is separated into three distinct parts:

- Part 1 – Demographic Representation
- Part 2 – Literature Review on Recruitment
- Part 3 – Analysis of Compensation

Part 1 – Demographic Representation

The key findings from an analysis on WSDOT’s workforce demographics are:

- There is a higher percentage of applicants of color than new hires of color.
- There is an over representation of applicants of color in all six counties
 - New hires, who are of color, are underrepresented in the North Central, South Central, and Eastern Regions
- The difference between the percentage of female applicants in each region to percentage of female hires in each region is low.
- Female applicants and new hires are underrepresented in all six regions throughout the state. The most notable underrepresentation is in the Northwest and Olympic regions.

One possible avenue for future research would be to detail SOC level data with industry level data to be able to conclude whether there is an industry-wide structural bias that is leading to the disparity between male and female new hires at WSDOT.

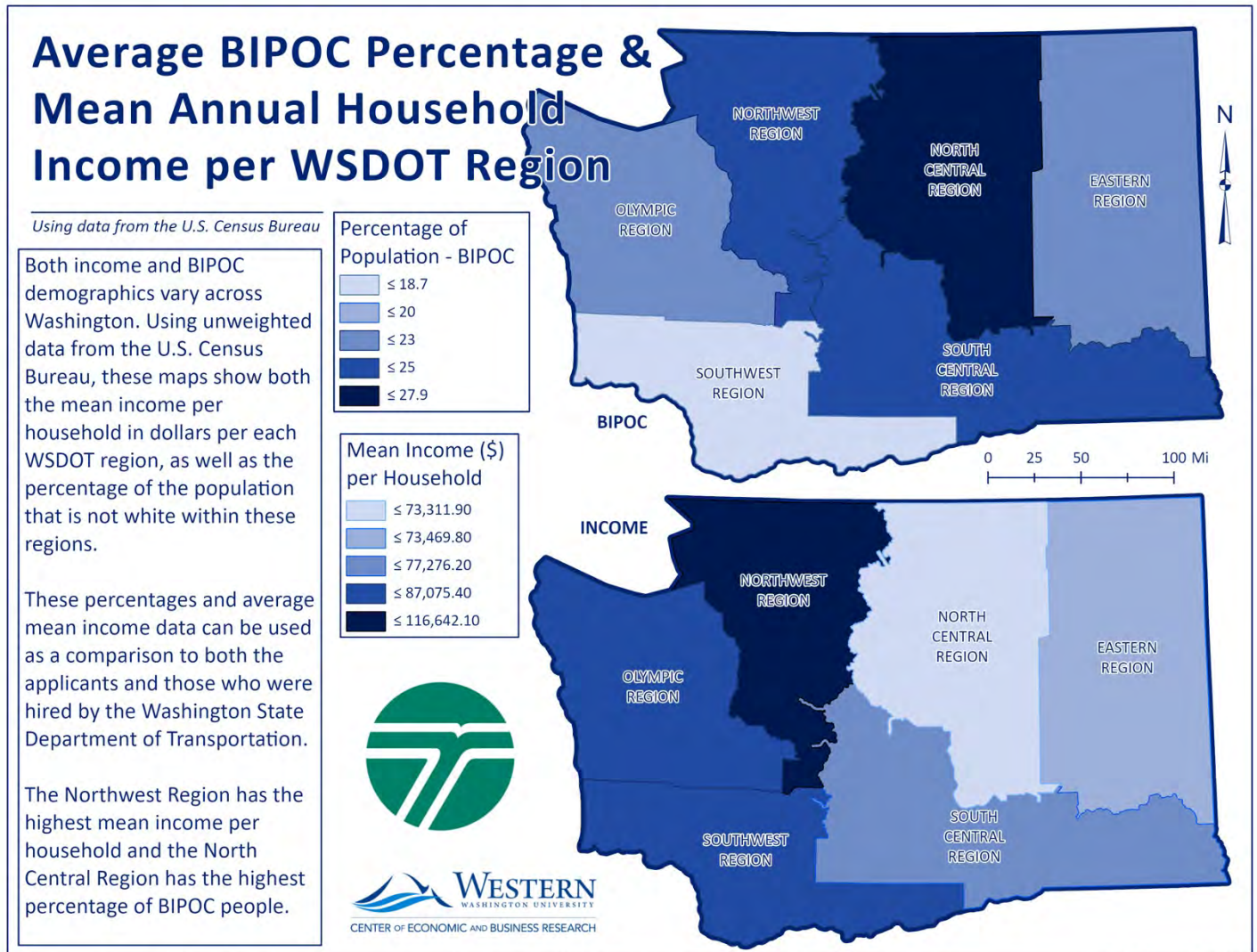
Methods

The main goal of question three is to compare the demographics and income from the U.S. Census Bureau to the new hires and applicants to WSDOT. Analysis for this was kept simple by connecting the data to the corresponding WSDOT region and displaying the unweighted value. These values could then be used to calculate the differences between the U.S. Census Bureau and applicants and the U.S. Census Bureau and new hires. The same formula used for differences in the previous questions was used to calculate differences in question three.

Average Percent of People of Color & Mean Annual Household Income

This map shows the average population for people of color percentage for six regions in Washington State in conjunction with the average household income for those same regions. The purpose of this map is to illustrate the average population of people of color and household income for each county to compare to the demographics and socioeconomic characteristics of WSDOT job applicants and new hires.

Figure 4: Average % of people of color and household income by region



U.S. Census Bureau 2019, WSDOT 2021

NAD 1983 HARN StatePlane Washington South FIPS 4602 South (m)

N. Furness, 6/9/21

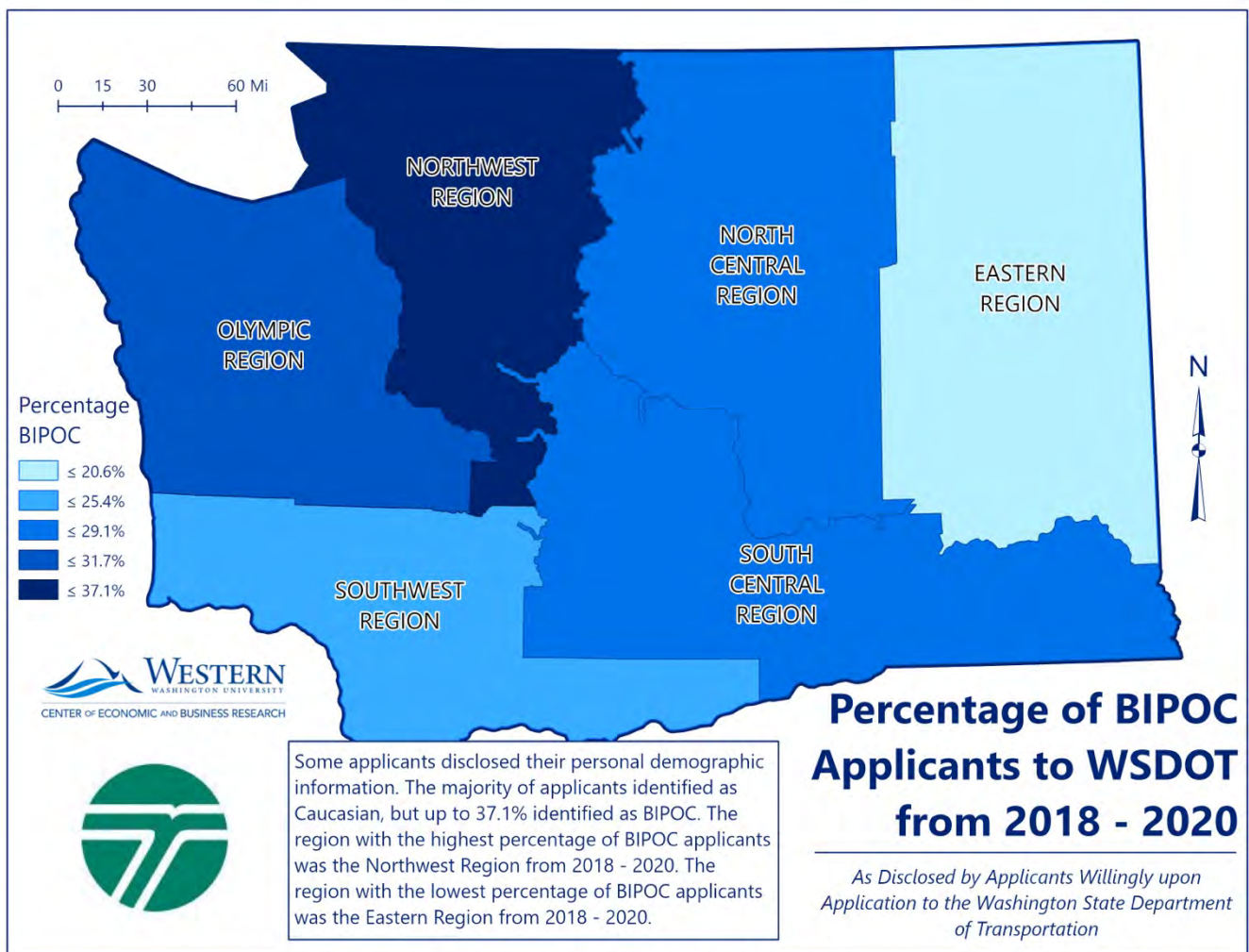
Applicants and New Hires of Color from 2018-2020

This section compares the percentage of applicants of color to open positions within WSDOT to the percentage of applicants of color that were hired into those positions. The key finding here is that there is a higher percentage of applicants of color than hires of color. This is to be expected to some degree, as there are many factors at play within the hiring process. However, this percentage difference may be pointing to issues within the recruitment and hiring process that are leading fewer hires from communities of color. Additionally, the Center found that the number of applicants of color is over representative in each of the six regions. However, the percentage of hires of people of color is under representative of the region's population of people of color in half of the six regions.

2018-2020 Applicants from Communities of Color

For the six regions in Washington State, this map shows the percentage of job applicants from communities of color. From 2018 to 2020, the Northwest Region had the highest percentage of applicants of color, between 31.8 and 37.1 percent. The Eastern Region has the lowest percentage of applicants of color, with less than 20.6 percent.

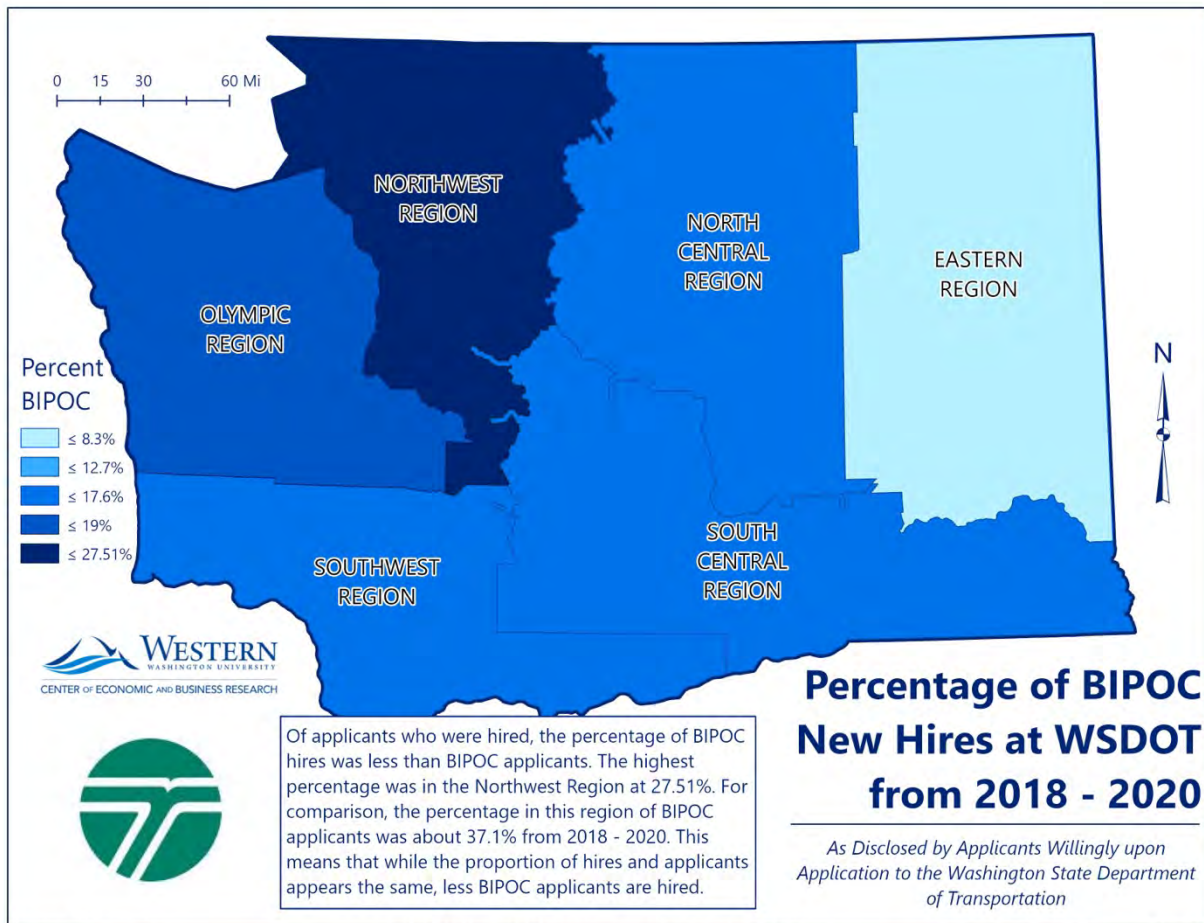
Figure 5: % applicants of color per WSDOT region.



2018-2020 New Hires of Color

In comparison to the percentage of job applicants of color from 2018-2020, this map shows the percentage of new hires of color from those applicants. In half of the six regions, 12.8 to 17.7 percent new hires were people of color. The Northwest Region had the highest percentage of new hires color while the Eastern Region had the lowest percentage. This aligns with the pattern observed from the percentage of applicants of color from each region.

Figure 6: New hires of color (%) at WSDOT



WSDOT 2018 - 2021

NAD HARN 1983 StatePlane Washington South FIPS 4602 (m)

N. Furness, 6/12/21

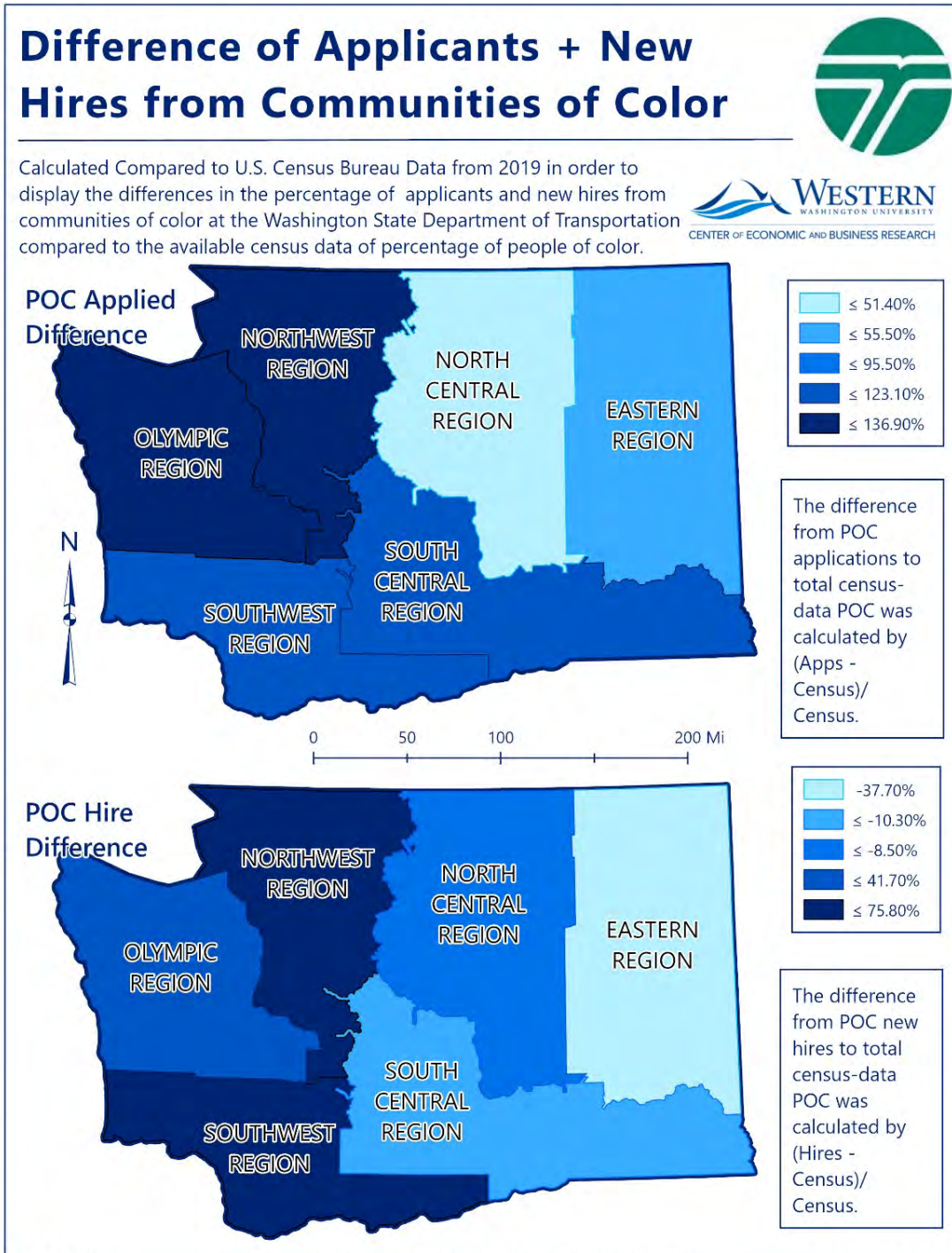
Percent Difference of Applicants of Color and New Hires at WSDOT

This map illustrates percentage differences for applicants and new hires of color for each region in the state. For these calculations, a zero percent difference would mean that WSDOT’s workforce is exactly representative of the population. Any negative percent difference reflects under representation and any positive percent difference represents overrepresentation.

The percent of people of color applicants is overrepresented compared to the people of color population in each of the six regions. However, the hiring of people of color is underrepresented in the North Central, South Central, and Eastern Regions. While the Northwest, Southwest, and Olympic

regions have an over-representation of hiring from communities of color, the percentage is less than for the applicant pool. Focusing on the North Central, South Central, and Eastern Regions, these maps highlight a pattern of over representation of applications from people of color to WSDOT positions but an underrepresentation of new hires from communities of color, meaning far fewer people of color applicants are being offered positions at the agency than are applying.

Figure 7: Difference (%) of applicants of color and new hires at WSDOT



WSDOT Recruits a Qualified Applicant Pool That is More Diverse Than the Local Population

However, WSDOT's Hires Are Less Diverse Than the Pool of Qualified Applicants in Every Region. In the Eastern and South Central Regions, Hires are Less Diverse Than the Local Population. This Suggests That Qualified Applicants Who Are People of Color are Less Likely to be Hired Than an Equally Qualified White Applicant

Female Applicants and New Hires from 2018-2020

Unlike to the findings between people of color applicants and new hires, the Center found that there is little difference between the percentage of female applicants and female new hires to positions within the agency. However, the percentage of female applicants is significantly lower compared to the percentage of male applicants. Although the findings show that most of the female applicants are being hired into open positions, there is also a notable under representation of female applicants in all six regions.

Percentage of Female Applicants and New Hires at WSDOT

This map shows the percentage of female applicants and new hires to WSDOT in six different regions across the state. The Northwest Region has the highest number of both female applicants and female hires while the South-Central Region has the lowest number of both female applicants and female hires.

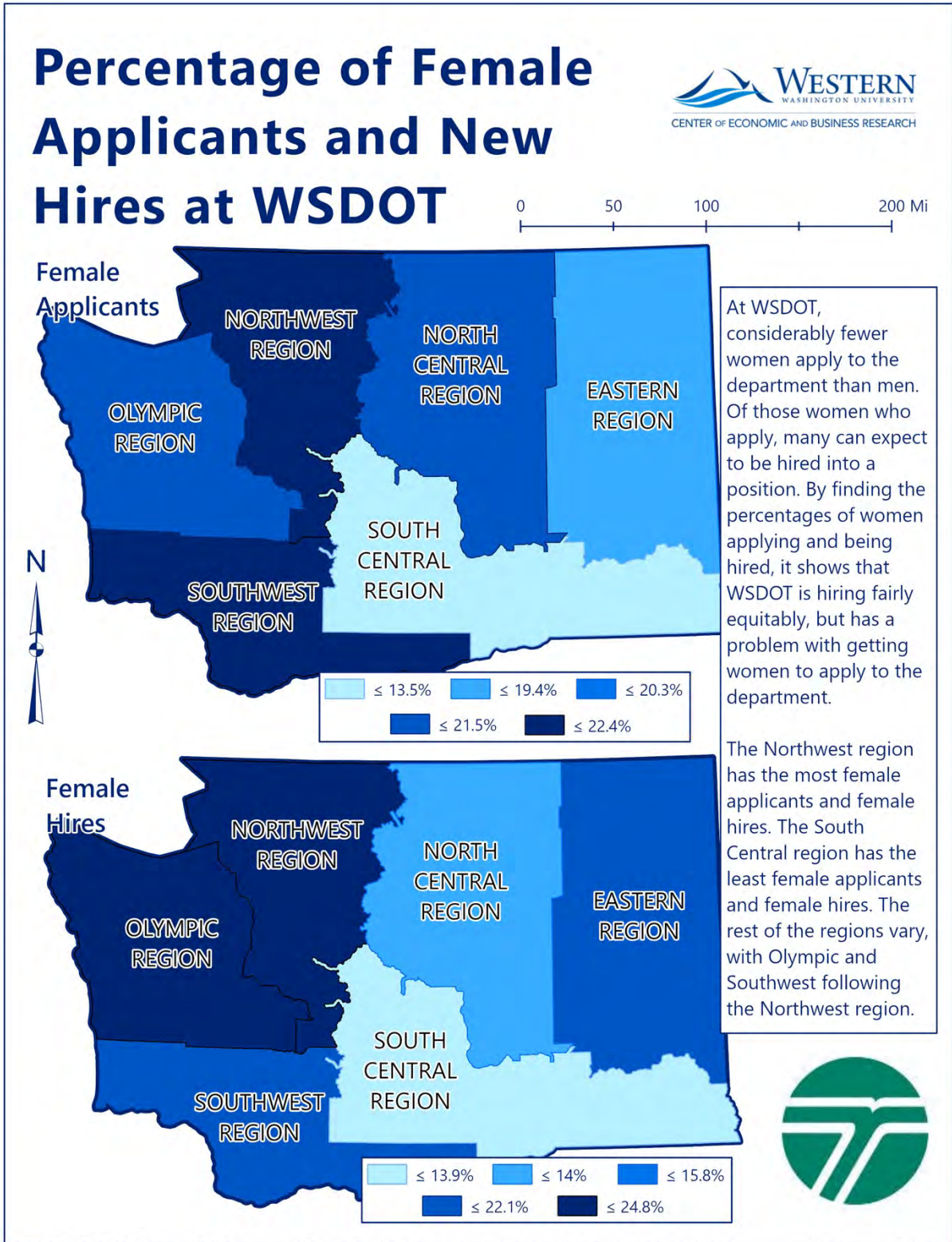
The difference between the percentage of female applicants in each region to percentage of female hires in each region is low. This means that most of the female applicants to WSDOT positions are being hired. However, overall, the percentage of female applicants and hires compares to males is much lower. This may show a disparity in the recruitment process rather than the hiring process when comparing male and female demographic patterns within WSDOT applicants and new hires.

Percent Difference of Female Applicants and New Hires at WSDOT

This map illustrates percent differences for female applicants and hires for WSDOT positions in comparison to the female demographic patterns in each region of the state. For these calculations, a zero percent difference would mean that WSDOT's workforce is exactly representational of the population. Any negative percent difference reflects under representation and any positive percent difference represents overrepresentation.

Female applicants and new hires are underrepresented throughout the state with no exceptions. Female applicants are notably underrepresented in the Northwest and Southwest Regions while female hires are most prominently underrepresented in the Northwest and Olympic Regions. The underrepresentation of female hires is not surprising given the underrepresentation of female applicants across the state.

Figure 8: Female applicants and new hires (%) at WSDOT



WSDOT 2021, US Census 2019

NAD 1983 HARN StatePlane Washington South FIPS 4602 (m)

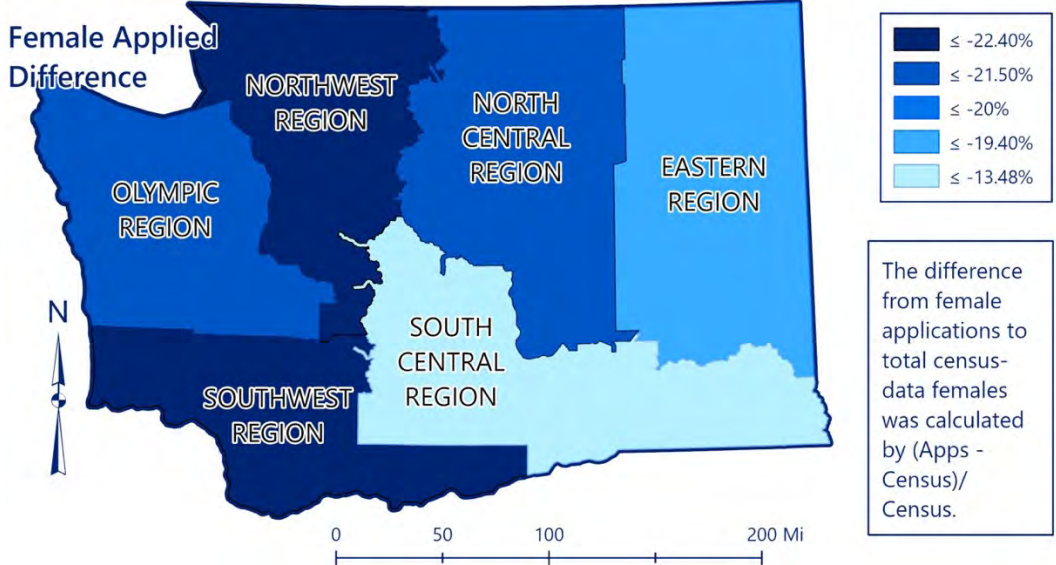
N. Furness, 6/17/21

Figure 9: Difference in female applicants and new hires (%) at WSDOT

Percent Difference of Female Applicants and New Hires at WSDOT

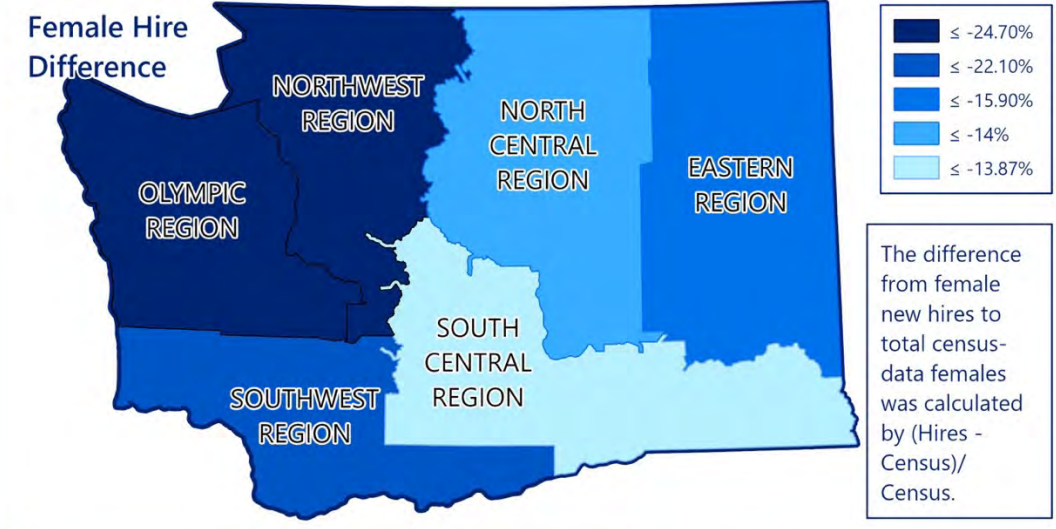


Calculated Compared to U.S. Census Bureau Data from 2019 in order to display the differences in the percentage of female applicants and female new hires at the Washington State Department of Transportation compared to the available census data of percentage of women 16 years and older.



The difference from female applications to total census-data females was calculated by $(\text{Apps} - \text{Census}) / \text{Census}$.

WSDOT Attracts Fewer Women than Men



The difference from female new hires to total census-data females was calculated by $(\text{Hires} - \text{Census}) / \text{Census}$.

However, the Gender Distribution of Hires is Similar to Applicants. This Suggests That Qualified Female Applicants Have the Same Likelihood of Being Hired as Qualified Male Applicants.

WSDOT 2021 NAD 1983 HARN StatePlane Washington South FIPS 4602 (m) N. Furness, 6/17/21

Part 2 – Literature Review on Recruitment

WSDOT Recruitment Process

The recruitment process at WSDOT starts with the appropriate Human Resources (HR) Office within the agency for the open position. Internal approvals and partnering between managers and/or supervisors with HR consultants are required before the formal recruitment process occurs. Once the recruitment process has been initiated, the position is equally accessible to both internal and external applicants. Based on documents shared with the Center, WSDOT’s recruitment process can be broken down into seven general stages: application screening, certification, interviews, salary setting, reference checks, background, criminal history checks, and appointment.

The initial screening of applicants is done using the minimum qualifications outlined in the position description that was made accessible to all applicants. In addition to the initial screening process, a designated subject matter expert (SME) may conduct a review of the job candidate’s application. This SME review is done before certification and serves as an additional resource in reviewing whether the experience and qualifications in each application will be sufficient for the applicant to sufficiently uphold the responsibilities of the position. After the initial screening of applications, additional screening methods are used to narrow down the candidate pool. The additional screening methods are decided upon between the position recruiter and hiring managers and are based solely on position-specific requirements.

According to WSDOT’s Human Resources Desk Manual,² certification occurs when applicants who meet all the requirements for the position are referred to the hiring official for further consideration. In WSDOT’s recruitment process, there is a set order in which applicants are certified, laid out by WAC 357-16-130. In addition, the number of applicants that are certified for any given position is determined by the appointing authority.

WSDOT uses a structured interview format, which includes a predetermined set of questions that are used for each candidate. The questions are position-specific, and any assessment criteria used in the interview process will be predetermined. For the interview process, there is a minimum of three individuals on the interview panel who are subject matter experts on the position. The interview panel will ideally have a diverse array of perspectives and backgrounds.

WSDOT is committed to ensuring the equal setting of wages and compensation for all current and future employees. In order to implement this commitment, WSDOT has outlined a set of rules for salary setting within the recruitment process. The compensation package offered for each position within the agency is job-specific and shall not be influenced by any outside factors that are not related to the responsibilities of the position. WSDOT employees are not allowed to inquire about the previous salary

² Washington State Department of Transportation. “Chapter 10: Recruitment, Assessment, and Certification.” *WSDOT Human Resources Manual*, December 2020.

of an applicant, nor can WSDOT use age, gender, or other demographic characteristics as the basis for setting different levels of compensation for employees with similar responsibilities.

From the WSDOT Human Resources Desk Manual,³ WSDOT defines a professional reference as “an individual with professional relation to the candidate who can attest to their work performance, technical skills, and job-related competencies.” All reference checks are conducted after the interview process has been completed, and generally include a minimum of three references for each candidate. Reference checks are conducted by the position recruitment and hiring managers using a predetermined set of questions. In addition to professional reference checks, WSDOT advises that the investigation or review of an applicant through online search engines or social media should be avoided during the recruitment process.

WSDOT is committed to conducting criminal background checks with the best interest of the candidate in mind. Results from criminal background checks may not automatically disqualify the candidate from employment until they have been evaluated and reviewed by the position recruiter. WSDOT is barred from obtaining any information on candidates’ background criminal history until it is determined that the candidate is qualified for the position.

The finale of the recruitment process is making an offer of employment to a candidate. All application materials, including interview notes, assessment checks, reference checks, etc. must be reviewed by the position recruiter and local HR consultant, and documented approval from the appointing authority must be received before an offer of employment is made to a candidate.

WSDOT’s Commitment to a Diversified Workforce

After reviewing WSDOT’s recruitment process, the Center has identified several features of the process that, if implemented, aid in ensuring an equitable recruitment process. It is important to note that these features must be put into practice in order for the intended effect to be seen. On that note, in addition to implementing new measures to ensure WSDOT’s workforce is representative of the communities that it serves, one additional option is to review the following practices that are already listed within the recruitment guidelines and prioritize enforcement of said practices. The elements of WSDOT’s recruitment process that are important in providing a channel to grow a more diversified workforce are listed below. Each bullet point is excerpted from WSDOT’s Human Resources Desk Manual.⁴ The importance of each bullet point will be discussed in the literature review section.

- All recruitment and selection efforts are open to both internal and external applicants (10-4 D)
- Reviews from the hiring manager or designate subject matter expert may not include an identifying information about the applicant (10-4.1 B)
- Establishing screening criteria that will be used to narrow down the certified pool of applicants before any applicants have been reviewed (10-4.1 C)

³ Ibid.

⁴ Ibid.

- Gaps in employment cannot be the sole cause for an applicant to be excluded from candidacy if the applicant is otherwise competitively qualified for the position (10-4.1 D)
- Using a predetermined set of questions for all candidates in the interview process (10-4.3)
- Interview panels consist of people from a variety of backgrounds, roles, and perspectives (10-4.3 D)
- WSDOT’s criteria for salary setting outlined in section 10-4.4
- Reference checks conducted after the interview process (10-4.5 C)
- General avoidance of the use of online search engines or social media reviews of the applicants during the recruitment process (10-4.5 E)
- Refraining from inquiring or obtaining information on an applicant’s criminal history until after the applicant has been determined as a qualified candidate for the position (10-4.6)

The 2019-2020 Recruitment Rollup and the 2020 EEO Assurances overview of the WSDOT Internal Diversity and ADA Compliance Program highlight further details of WSDOT’s recruitment process, as well as internal efforts, that illustrate a commitment to cultivating a diverse workforce.

As will be mentioned in the following section, the amount of time between when an applicant applies for a job and when that position is filled is critical for maintaining a functional recruitment process and ensuring that the most qualified candidates are offered a position. According to a report from Glassdoor Economic Research, the average time to fill in the US is 23.8 days – the average time to fill a position for government employers is currently 53.8 days. WSDOT is currently clocking an average of 50.6 days to fill a position⁵, which is below the government agency average but almost twice the US average. This shows that current metrics and programs in place to streamline the hiring process are showing promising results in comparison to other agencies but that there is still substantial room for improvement.

Position advertisement and marketing is another arena where WSDOT’s current practices are showing encouraging results. It is without question that social media and other online platforms are now the number one resource of job seekers.⁶ WSDOT is employing the resources offered by major job posting platforms, such as Indeed.com and Handshake.⁷ This strategy strengthens the agency’s online presence and casts a much wider net into the applicant pool, which is a critical component of ensuring a diverse applicant pool from the start. However, that all being said WSDOT must maintain a relationship a relationship with the communities it serves. Continuing to be involved with higher-ed institutions, job fairs, and the like enables WSDOT to establish a constructive agency image while also supplementing recruitment by bolstering a brand as a reliable employer within local communities.⁸

By committing to a recruitment process that fosters diversity amongst candidates and new hires, an agency must also commit itself to other avenues that go beyond the confines of the recruitment

⁵ Chamberlain, Andrew. “How Long Does It Take to Hire? Interview Duration in 25 ...” *Glassdoor Economic Research*, 2017

⁶ Jones, Krystle. Washington State Department of Transportation, 2019, pp. 4–14, *Recruitment Rollup*

⁷ Ibid.

⁸ Ibid.

process. The 2020 EEO Assurances overview of the WSDOT Internal Diversity and ADA Compliance Program details WSDOT commitments that are critical to not only attracting a more diverse workforce but cultivating a workplace culture that is welcoming to all employees regardless of background. In the first chapter, the document lays out specifics on how it is maintaining its Internal Equal Employment Opportunity Program. The specifics include the use of business resource groups (BRGs), representation on the Washington State Diversity, Equity and Inclusion Council, the WSDOT statewide Diversity Advisory Group (DAG), and the use of the Learning Management System (LMS) for mandatory employee trainings.⁹ These specifics are important for diverse recruitment and retention efforts because they foster the development of strategies, space for employee input, allyships, community-wide discussions, and region-specific goals.

The second chapter of the 2020 EEO Assurances gives an overview of WSDOT's compliance with the Americans with Disabilities Act (ADA). The biggest takeaway from this section is WSDOT's Involuntary Disability Separation for employees who are no longer able to fulfill the responsibilities of their position, which includes reemployment assistance.¹⁰ Before an Involuntary Disability Separation is initiated, WSDOT has proven its commitment to providing employees with necessary accommodations – in fiscal year 2019-2020, for the 108 employees that requested accommodation, 168 requests were met.¹¹ The struggles of individuals with disabilities in the workplace cannot be understated. By committing to providing employees with the resources they need to perform their jobs, WSDOT is showing that an employee's disability status does not dictate their value as an employee and that their perspective and input are viewed equally in the eyes of the agency.

The first step in developing an equitable recruitment process that will result in a diversified workforce is to analyze the current process in place and identify the areas that can be effectively revised to result in the most impactful changes. The human resources services at McMaster University¹² has published a series of questions that can be used to guide the implementation of the best equitable recruiting practices into a recruitment process. These questions include:

- Have we created a Selection Committee that is committed to the principles of fair and equitable recruitment? Are all Selection Committee members trained or educated on equitable practices? Have we ensured that our assessors are themselves appropriately diverse?
- Have we identified the skills, experience, and competencies that are required to perform the essential duties of the position? Have we created a rubric based on those requirements to support fair and consistent candidate assessment? Have we identified preferred qualifications, and turned our minds to how such preferences may create barriers to equity and diversity?
- Have we ensured that all members of the interview team are familiar with the appropriate and respectful ways to phrase questions in an interview?

⁹ Office of Human Resource and Safety. Washington State Department of Transportation, *2020 Equal Employment Opportunity (EEO) Assurances – Part II Update*

¹⁰ Ibid.

¹¹ Ibid.

¹² McMaster University. "Best Practices for Equitable Recruiting." *Human Resources Services*

- Have we ensured that all members of the interview team are familiar with competency-based interviewing, so that candidates will be encouraged to provide specific examples from their work experience that demonstrate the skills and competencies required for the position?
- Have we used inclusive and non-gendered language in the job posting? Have we advertised the job to attract a diverse pool of qualified applicants? Have we actively recruited diverse candidates?
- Have we applied fair and equitable assessment practices at each stage of candidate assessment? Have we consciously worked to eliminate bias through this recruiting process?
- Have we documented, and can we justify, our selection decisions at each step of the process?
- Have we evaluated the recruitment process and the contribution of the Selection Committee members?

Having answers to these questions, even if it is a simple yes or no, will be extremely valuable in highlighting the areas of recruitment that are not aligned with the values and goals of an employer and serve as a guide in moving forward with revising and implementing various recruitment practices.

Best Equitable Recruitment Practices

There is extensive literature on the best recruitment practices for equitably recruiting a diverse workforce. However, the most relevant practices are those that are designed to evolve with shifting workforce demographics, provide educational opportunities for future generations to develop skills in the workforce, and highlight career tracks in public service.¹³ After reviewing the existing literature on this topic, the Center has identified the best equitable recruitment practices that are both widely used, and frequently discussed in the literature.

Focus on Building Talent Pipelines

There are many private recruitment practices that a public agency, such as WSDOT, can implement into its recruitment process. One of these practices that was frequently discussed in the literature is to start developing talent pipelines. The San Francisco Fellows Program operates under the San Francisco Department of Human Resources with the sole purpose of developing “community stewardship by preparing recent college graduates and young professionals for roles in public service and administration.” The program also targets historically black colleges.¹⁴ Through the program, fellows spend almost 12 months working full time as city employees, earning competitive pay, benefits, and on-the-job training through several projects including city planning and program development.¹⁵ Although it is competitive, San Francisco Fellows program is a perfect example of how building talent pipelines

¹³ Center for State and Local Government Excellence, et al. “Stakeholders Meeting on Developing The Public Sector Workforce of the Future.” *Center for State and Local Government Excellence*

¹⁴ City & County of San Francisco. *About Us | Department of Human Resources*

¹⁵ *Ibid.*

can bring diverse and qualified candidates into public service careers.¹⁶ Similar to talent pipelines, government agencies can utilize fellowships, mentorships, job shadowing, and apprenticeships to target hiring at a more diverse pool of candidates while also giving candidates an on-the-job opportunity to develop skills.¹⁷ These models can help increase diversity within an agency's workforce because they expand recruitment opportunities to different populations. Candidates from a diverse set of backgrounds tend to come from non-traditional career feeds. Therefore, agencies must open their doors and recruitment processes to these non-traditional pathways by providing opportunities for agency positions that have not been traditionally utilized. In addition, in promoting non-traditional pathways into public service careers, agencies must participate in outreach to K-12 schools to begin developing communications with potential candidates as well as work with guidance counselors on the opportunities available to students.¹⁸

Update Codes of Ethics and Job Descriptions

One of the main reasons why updating codes of ethics and job descriptions, and making that information available to candidates, can help support the growth of a diversified workforce is that they can help show potential candidates the agency's commitment to inclusion and equity, as well as emphasize the benefits of public service careers. An example of this would be integrating into the codes of ethics or the job descriptions any innovative practices and modern developments that the agency has made,¹⁹ and by doing so highlighting the agency's inclusiveness and involvement with society.

The language used in job descriptions is one of the most important places that an agency can focus on in hopes of diversifying its recruitment process. For example, the minimum requirements listed in the position description can be a large deterrent for many applicants who may be well suited to fill the position but do not have the exact requirements listed. Using flexible language, such as "similar" or "related work" in the minimum requirements for a job will be crucial in recruiting a higher number of applicants as it shows hopeful candidates that the requirements are flexible and therefore, they will be more likely to apply.

Language is an imperative focus for any discussion around diversity. The language an agency uses in the public domain is going to be the first form of "interaction" that a potential job candidate will have with the agency and therefore the language can be the sole reason why an individual may or may not decide to apply for a position. In terms of recruitment practices, the language needs to convey the message that the agency wants applicants to come and bring new perspectives and changes. The applicants should feel that they have a space to voice themselves and their perspectives and that their input will be

¹⁶ Kellar, Elizabeth, and Gerald Young. Center for State and Local Government Excellence, 2018, *Workforce of the Future: Strategies to Manage Change*.

¹⁷ Center for State and Local Government Excellence, et al. "Stakeholders Meeting on Developing The Public Sector Workforce of the Future." *Center for State and Local Government Excellence*, 2020, www.slge.org/.

¹⁸ Ibid.

¹⁹ Staff, Recruiting Daily Advisor Editorial. "Strategies for Effectively Recruiting Government Workers." *HR Daily Advisor*

valued. Diverse recruitment is not about setting the table for many different people and expecting them to all fit into a pre-set mold. Committing to a diverse recruitment process is about providing a table for individuals from different backgrounds to bring their own place settings as a contribution to the functioning of the agency.

Additionally, for entry-level jobs, online software programs can be used to test the reading and comprehension grade-level of content in job advertisements and public-facing website content/media. The comprehension grade level, especially for entry-level jobs, can be imperative in opening the space for a wider range of potential candidates to apply.

Emphasize Competitive Benefit Offerings in Job Postings and Descriptions

There should be a strong emphasis on the competitive benefit offerings in both the job postings as well as the job descriptions. These benefits should include an emphasis on opportunities for advancement, job security, and workplace flexibility.²⁰ Hiring within government agencies can be difficult because the private sector often provides higher pay levels. However, by clearly communicating the benefits associated with a career in public service, including but not limited to health and retirement benefits, paid time off and/or parental leave, and student loan assistance can be the deciding factor in a potential job applicant choosing the public versus private sector.²¹ One way to communicate the available benefits is to consider putting a monetary value on those benefits. This will help public agencies because having a monetary value of the position's benefits will make it easier for the applicant to conceptualize the value of the benefits and compare the total compensation of the job to similar positions in the private sector. Additionally, an increasingly popular job benefit is workplace flexibility. The onset of COVID-19 forced many companies and agencies to quickly adopt work-from-home strategies. While this process was streamlined due to the pandemic, maintaining, and emphasizing the flexibility of work arrangements within the agency can be paramount in recruiting a diverse workforce.

In general, but especially with younger generations, applicants are not only looking for a job, but they are looking for quality of life in their jobs. This is to say that job applicants are looking for an employer that is committed to them as an individual, not just as an employee. One way to facilitate the communication of an agency's commitment to its employees or potential employees is by including messages from heads of departments, which can help close the gap between employer and employee. Additionally, including images of actual employees in the workplace and interacting in the day-to-day work environment can help convey an agency's culture to potential job applicants.

²⁰ Dohrmann, Thomas, et al. "Attracting the Best." *McKinsey & Company*, 2008

²¹ Ramsey, Mike. "Hiring Challenges Confront Public-Sector Employers." *SHRM*

Streamline HR Processes with Technology

Technology is a great tool in advancing recruitment processes for a variety of reasons. Some of the issues that have been identified in the literature by human resources leaders that technology can be used to address include reducing the response time to job applicants, simplifying the application process, assessing applications, and making onboarding trainings more accessible.²² Aside from acknowledging the importance of carefully screening applicants, removing some of the obstacles in the recruitment process can lead to a more diverse and talented workforce since it eliminates the lengthy time that is generally associated with hearing back from government agencies on open positions.²³ Nowadays, young professionals are increasingly gravitating to the private sector where the recruitment and hiring process is more streamlined, so by cutting down on the time it takes to respond to applicants, government agencies will be making themselves more competitive employers.

One of the most impactful ways to drive changes in a system, including recruitment processes, is the implementation of new software, such as artificial intelligence. However, there are valid concerns that arise with the use of modern technology, including unintended biases and accessibility. These concerns should not be cause for avoiding technology use in recruitment processes, but they do highlight the importance of identifying the possible causes of these problems and having systems in place to avoid those issues from the get-go. Additionally, as important of a role that modern technology can play in facilitating diverse recruitment processes, using the easiest, most simple level of technology can be helpful in terms of accessibility.

Social Media

Agencies should not rely on candidates to seek out available job openings, as this will not only add to the time that it takes to fill a new position, but it will also mean that the agency will have a less diverse pool of candidates to review for the position. Instead, agencies should be proactively identifying communities and organizations from which to recruit talented individuals to apply. One of the most effective tools for proactive recruitment is the use of social media to advertise job openings. In fact, online job postings are the most effective way to market open positions to the public.²⁴ Social media is used by millions of individuals, which means that the platforms offer a vast community of individuals that can be marketed to. In addition to providing information about available job openings, social media is a great place to advertise the benefits of working in the public sector.²⁵

²² Kellar, Elizabeth, and Gerald Young. Center for State and Local Government Excellence, 2018, *Workforce of the Future: Strategies to Manage Change*.

²³ Ramsey, Mike. "Hiring Challenges Confront Public-Sector Employers." *SHRM*.

²⁴ Kellar, Elizabeth, and Gerald Young. Center for State and Local Government Excellence, 2018, *Workforce of the Future: Strategies to Manage Change*.

²⁵ *Ibid.*

Market to Individuals with Disabilities

Individuals with disabilities offer important perspectives and have important skills that many government agencies too often overlook.²⁶ In order to advertise positions to individuals with disabilities and ensure that they are being represented within an agency's workforce, it is essential that position descriptions are accessible to those individuals through screen readers and other technological sources so that they have access to the application.²⁷

Implicit Bias Training

Implicit bias trainings are important educational tools for not only the individuals within an agency who are responsible for hiring but for all employees at all levels. These trainings expose individuals to potential implicit biases that they may hold. Implicit bias trainings are extremely important to utilize both agency-wide and within the hiring process because they can help eliminate discriminatory behaviors within the workplace by providing tools and resources for individuals to address their thought patterns²⁸. The city of San Francisco is a great example of how implicit bias trainings and practices are being implemented into the hiring process. The city is doing so but not showing the names, addresses, or schools of job applicants to hiring managers until after it has been decided which applicants are moving forward to the interview stage.²⁹

Retention Strategies

In recruiting a diversified workforce, there should be a strong emphasis on an agency's retention strategies. While this in and of itself is a complicated conversation to have outside of recruitment efforts, retention strategies must be included in recruitment conversations as those strategies show how committed an agency is to not only diversity recruitment but fostering a diverse and inclusive workspace for all employees. The main topics centered around retention tactics include discussions around onboarding, mentorship, promotional opportunities, fairness and pay, and employee engagement. Measuring engagement is an ongoing process that will be important for any agency devoted to improving diversity both through recruitment practices and workplace culture. One-on-one conversations with employees and engagement surveys that include questions about diversity, equity, and inclusion are only some of the ways that employee engagement can be monitored. Employee engagement is not only a useful tool for an agency to monitor the sentiments of its employees, but it can also serve as a resource for employees to use to voice their concerns, provide feedback, and highlight potentially serious issues.

²⁶ Kellar, Elizabeth, and Gerald Young. Center for State and Local Government Excellence, 2018, *Workforce of the Future: Strategies to Manage Change*.

²⁷ 6 Steps to Improve Equitable Hiring Practices. *Career & Internship Center | University of Washington*,

²⁸ Implicit Bias Training. *Wikipedia*, Wikimedia Foundation.

²⁹ Kellar, Elizabeth, and Gerald Young. Center for State and Local Government Excellence, 2018, *Workforce of the Future: Strategies to Manage Change*.

Additional Resources

In addition to the practices discussed above, there are a wide variety of techniques that can be helpful in any recruitment process but may also be especially helpful in reaching out to marginalized communities. One example would be to engage in recruitment outreach to different parts of the country. Although the agency may be looking to fill a local position, there may be many individuals willing to relocate for a specific job. This allows an agency to recruit from a much wider candidate pool and welcome a much broader array of perspectives into the agency. An example of this outreach could be through making unique calls to individuals around the country. These direct calls have a personal connotation to them, which is an accessible way for an agency to show its willingness to put in a deliberate effort to recruit the best candidate for a position. However, those calls do not necessarily have to be a recruitment call, but they can also be used to stay in contact with organizations, companies, and people that can serve as an untapped resource for potential candidates. Along those lines, partnering with ally organizations and individuals is critical in building relationships with marginalized communities. These ally organizations can be especially important in providing guidance and resources from new perspectives. Additionally, this outreach is a way for an agency to show its commitment to diversity and diverse recruitment by making an effort to reach out to all communities, engage in dialogue with them, and be willing to work with representatives from any community to make the agency a safe, engaging, and stimulating place of work.

Public agencies may also want to consider the use of opportunity appointments for an open position rather than opening every available position to internal and external candidates. According to Dennis Dashiell, the assistant director of organization and talent development at Western Washington University, establishing an agency-wide policy around the use of opportunity appointments is a great additional resource for “promotional development of diverse employee groups, retention, and further diversification of leadership.”

Reforming the Recruitment Process

The first step in developing an equitable recruitment process that will result in a diversified workforce is to analyze the current process in place and identify the areas that can be effectively revised to result in the most impactful changes. The human resources services at McMaster University³⁰ has published a series of questions that can be used to guide the implementation of the best equitable recruiting practices into a recruitment process. These questions include:

- Have we created a Selection Committee that is committed to the principles of fair and equitable recruitment? Are all Selection Committee members trained or educated on equitable practices? Have we ensured that our assessors are themselves appropriately diverse?
- Have we identified the skills, experience, and competencies that are required to perform the essential duties of the position? Have we created a rubric based on those requirements to support fair and consistent candidate assessment? Have we identified preferred qualifications, and turned our minds to how such preferences may create barriers to equity and diversity?
- Have we ensured that all members of the interview team are familiar with the appropriate and respectful ways to phrase questions in an interview?
- Have we ensured that all members of the interview team are familiar with competency-based interviewing, so that candidates will be encouraged to provide specific examples from their work experience that demonstrate the skills and competencies required for the position?
- Have we used inclusive and non-gendered language in the job posting? Have we advertised the job to attract a diverse pool of qualified applicants? Have we actively recruited diverse candidates?
- Have we applied fair and equitable assessment practices at each stage of candidate assessment? Have we consciously worked to eliminate bias through this recruiting process?
- Have we documented, and can we justify, our selection decisions at each step of the process?
- Have we evaluated the recruitment process and the contribution of the Selection Committee members?

Having answers to these questions, even if it is a simple yes or no, will be extremely valuable in highlighting the areas of recruitment that are not aligned with the values and goals of an employer and serve as a guide in moving forward with revising and implementing various recruitment practices.

Reviewing the list of questions above is an example of a business process analysis, which is one of the first steps necessary in establishing a diverse recruitment process. However, diversity recruitment is not a one and done process, it is a continuous commitment to expanding an agency's workforce to include individuals from a variety of backgrounds and identities. That is all to say that underneath the discussion of the next steps to take implementing the best recruitment practices for a diverse workforce, the methods discussed must be implemented to become a routine part of the recruitment process. Part of this operational work includes having tactical conversations, not just with employees and other

³⁰ McMaster University. "Best Practices for Equitable Recruiting." *Human Resources Services*

agencies, but also showing up and being present in the spaces of marginalized communities. It is critical to approach these communities and show a commitment to working with them and listening to the perspectives that they represent. Recruitment is not a passive process, and it should not be assumed that a diverse array of candidates will apply for position openings without the agency itself putting forth the effort and resources to show that diversity is a core value to the agency.

In addition to analyses of business and recruitment processes, another important step that can be helpful is the use of an equity audit. However, equity audits cannot be performed solely from the perspective of the people already in the majority. This is another area where partnerships with allies and external consultants can be helpful. Additionally, analysis can be performed using models, such as the Equity and Empowerment Lens developed by Multnomah County. This is a racial justice focused resource focused towards developing more racially equitable policies and programs through the improvement of planning, decision-making, and resource allocation.³¹

The University of Washington (UW) has developed a set of steps to improve equitable hiring practices for the recruitment of UW students into entry level jobs and internships.³² While the target audience of the following steps is not government agencies, the information laid out by UW is in alignment with the literature on the best equitable recruitment practices and offers a holistic example of how recruitment practices may be changed or implemented into a recruitment process. The six steps and the accompanying explanations are laid out below:

1. Develop the position

To ensure an equitable and diversified workforce, it is important maintain a commitment to diversity before, during, and after the hiring process. When a position opening becomes available, or when developing a position, it is important that the position is curated with equitable wages and responsibilities, according to the agency standards and expectations. In this way, the position can be accurately marketed to the individuals who are best suited to fill the role.

2. Write the position description

In general, there are standard practices in writing the position description that can be followed for hiring processes within any agency. However, in trying to ensure a diverse recruitment process, there are some addition steps that should be taken to highlight the agency's commitment to diversity. To begin, the position description should include gender neutral language and should be free of potential bias. It should be clear in the position description which qualifications are necessary, versus ones that are preferable and/or that the candidate can learn on the job. It has been documented that many marginalized groups will refrain from applying for an open position if they do not meet all the

³¹ Equity and Empowerment Lens. *Multnomah County*

³² 6 Steps to Improve Equitable Hiring Practices. *Career & Internship Center | University of Washington.*

qualifications, so it is critical that this distinction is made. If a cover letter is required in the application, the use of a prompt that will enable the applicants to discuss their individual approaches to diversity and equity will be helpful in identifying the candidate's skills and values surrounding inclusion and how they will commit to it through their professional responsibilities. It will also be important that the agency's commitment to equity and diversity, not just in the hiring process but in agency operations as well, is explicitly highlighted in this section as well. This can be done in a variety of ways, but at the very least should entail the addition of a diversity and inclusion statement. It is also crucial that the position description is made available to individuals with disabilities who rely on screen readers or other forms of technology. Ultimately, the position description is often the first introduction a potential candidate has to the position opening. Therefore, this step in the recruitment process is critical in highlighting an agency's commitment to diversity, as well as attracting candidates from a variety of backgrounds that are best suited to fill the position.

3. Recruit applicants

When an agency begins its recruitment process, it is important that the position be marketed to a large, diverse candidate pool, but also that the agency is intentional in deciding which groups it is contacting. This may seem a bit contradictory, but what it means is that the marketing of a position should be tailored to specific communities and organizations, rather than individuals and/or cohorts already in contact with the agency. However, in reaching out to these communities of diverse candidates, it is important that the agency highlights its interest in individuals because of the knowledge, skills, and values that they can bring to the position, not because their race, ethnicity, or gender identities are ones in which the agency is trying to bolster to help with the numbers. This will only further marginalize these communities and cause further disengagement with agency operations, instead, emphasizing the agency's goal in bringing diverse perspectives to its operations will show that the agency values diversity, inclusion, and can provide individuals with a work environment that enables them to thrive as employees and as individuals.

4. Review applications

Once a wide net has been cast to potential candidates and the agency has a sufficient candidate pool, the next step in the recruitment process is reviewing which applicants to interview. One of the most widely used and effective tools that is discussed in the literature around best recruitment practices is the use of a rubric in reviewing applicants. Rubrics not only help maintain balance and ensure that the best-fit candidates are chosen for the next steps, but they are also critical in eliminating bias and unfair advantages. Using a rubric is an effective and dependable method for agencies to assess application materials and the applicant's qualifications objectively and thoroughly.

5. Interview candidates

Not only are rubric's useful in applicant reviews, but they are also commonly used in interview processes as well. The use of a rubric score system, as well as standard questions asked to all candidates, ensures that any inequities and bias are eliminated in this step of the recruitment process as well. The set of questions asked to each applicant should include behavioral questions to allow candidates to highlight and elaborate on their skills, qualifications, and achievements and how they believe they are a good fit for the position.

6. Onboard new hires

The recruitment process does not end with a job applicant accepting a job offer as the onboarding process is just as crucial of a step in fostering a diverse workforce as all the steps that came beforehand. Onboarding is an opportunity for the new employee(s) to get introduced to the agency, build relationships with current staff, and for the agency to get a better understanding of what the new hire(s) needs moving forward to be successful in the position. Agencies should make an effort to individualize the onboarding process as new hires may need different accommodations in order to feel prepared to take on their new position. A long-term part of the onboarding process includes developing an engagement plan for each new hire. This plan should include scheduled check-ins, a communication and evaluation plan, and a way that makes it easy for both new employees and management to provide feedback and discussion. This engagement plan will be especially critical in the first few months after hiring new employees. It not only shows the agency's commitment to providing its employees with a safe and inclusive environment, but it will also provide a direct outlet of communication and support for the new employee(s) so that they feel welcomed and valued within the agency.

Recruitment Practices that WSDOT can Implement

Below is a list of recruitment practices and/or strategies that WSDOT can implement to update the recruitment process currently in place to foster a more diverse workforce. Some of these suggestions are practices that are currently in place within the agency and should be continued while others offer new avenues of recruitment strategies.

- WSDOT should continue to implement the current practices in place to keep time to fill averages low. Although the current time to fill average for WSDOT is lower than the state average, there is still much improvement to be made compared to the US average time to fill. Technology will play a key role in streamlining the time to fill process.
- Transition the recruitment process approach from transactional to consultative. This shows a commitment to a more holistic review of the applicant's skills, experience, background, and perspectives.
- WSDOT should implement strategies and set targets to reduce the variance between diverse applicants and diverse new hires. The targets should be set to be exactly, or even over, representative of the population characteristics within the region of hire. It is important to keep

in mind that reaching these targets will be a very gradual process, and therefore progress should be measured incrementally to stay on track.

- One way to reduce that variance, and increase diversity within the applicant and employee pool, is to have more targeted outreach to specific groups of interest. This can be done through marketing, partnerships with allies, engaging with different communities, social media, employing the use of talent pipeline programs, and opportunity appointments.
- Update all job posts and descriptions with more inclusive language, as well as stronger emphasis on benefits and compensation.
- Revise, update, and/or develop comprehensive retention strategies.
- WSDOT's 2020 EEO Assurances lists ongoing actions that are being used to promote diversity within the agency. All the actions and targets listed in the report should continue to be implemented.

It should be noted that many of the best recruitment practices for diversity discussed in the literature are already being implemented in WSDOT's recruitment process. After reviewing WSDOT's current recruitment process and policies, it is clear that the agency's best step forward is to continue with the commitments already made. Even if all of the target metrics have not yet been achieved, an internal review shows promising movement on a number of levels within the recruitment and hiring process. Fostering a diverse workforce is a long-term commitment, a commitment that WSDOT has prevalently shown dedication to. Continuing the practices and programs in place, while simultaneously remaining open to new ideas and methodologies, is the best step that WSDOT can take moving forward.

Part 3 – Analysis of Compensation

In this section of the report, we explore equity through the lens of employee compensation. Using data on WSDOT hires from the 2019 and 2020 fiscal years, we look at two questions:

1. Is WSDOT’s compensation comparable to regional salaries in similar fields?
2. Does WSDOT compensate employees uniformly regardless of race or gender?

Given the relatively small sample sizes for regional hires and total female or people of color hires, the margins of error are large – adding or subtracting one employee could shift mean/median calculations substantially. With that being said, the data does not show any trend in over or underpayment of employees by demographic group. By region, many sectors had median WSDOT hires who were compensated below the average, regional, entry-level salary; however, this does not account for benefits, which may be better in government positions.

Regional Comparisons

This section breaks down recent WSDOT hires by region and Standard Occupational Classification (SOC) code. From there, WSDOT median salaries are compared to Bureau of Labor Statistics (BLS) data on salary ranges for a given SOC code in that region. From this database, we display the average entry-level salary, as well as the regional 25th, 50th (median), and 75th percentile salaries for the region.

Given that we are looking at WSDOT’s new hires, the primary point of comparison is with entry-level salaries. Based on the data provided by WSDOT and gathered from BLS:

Table 3: Percentage of WSDOT Jobs with Median Wages Less Than the Entry-Level Average in the Local Market

Region	Percentage of WSDOT job titles with median wages less than the entry-level average in the local market
Headquarters	56%
Eastern Region	75%
North Central Region	75%
Northwest Region	38%
Olympic Region	25%
South Central Region	22%
Southwest Region	38%

This suggests that many of WSDOT’s recent hires could find a similar entry-level position in the region with a different employer and would receive a higher base salary. It should be noted this analysis does not take into consideration health insurance and other benefits that may be superior in a government position.

SOC Codes

To analyze WSDOT’s compensation of new hires, positions are disaggregated by Standard Occupational Classification (SOC) code. This system allows for similar jobs within WSDOT and the broader community to be directly compared. In the table below is a summary of the 2-digit SOC codes represented within WSDOT’s new hires. The 6-digit codes used in our analysis are subsegments of these 2-digit sectors.

Table 4: Definitions of 2-digit SOC codes

2-Digit SOC Codes Represented in WSDOT New Hires	
2-Digit SOC Code	Description
51-0000	Production Occupations
49-0000	Installation, Maintenance, and Repair Occupations
43-0000	Office and Administrative Support Occupations
39-0000	Personal Care and Service Occupations
31-0000	Healthcare Support Occupations
27-0000	Arts, Design, Entertainment, Sports, and Media Occupation
23-0000	Legal Occupations
15-0000	Computer and Mathematical Occupations
13-0000	Business and Financial Operations Occupations
11-0000	Management Occupations

Source: Bureau of Labor Statistics

Headquarters

Table 5: Comparison of WSDOT Headquarters salary to average by SOC

Salary Comparisons - Headquarters							
SOC	WSDOT Median SFY 2019-2020	WSDOT Pay Ranges	Entry-Level	25th Percentile	Median	75th Percentile	WSDOT Median vs. Entry-Level
43-5053	\$24,247	\$100-\$42,900	\$37,400	\$41,000	\$58,900	\$60,200	-35%
43-4031	\$39,984	\$20,000-\$69,900	\$45,200	\$48,200	\$53,400	\$61,200	-12%
43-3041	\$32,883	\$16,000-\$42,900	\$28,100	\$28,100	\$29,300	\$31,600	17%
43-3031	\$32,604	\$16,000-\$42,900	\$34,800	\$38,100	\$46,200	\$55,600	-6%
43-3021	\$14,662	\$100-\$15,900	\$34,800	\$37,000	\$42,700	\$49,700	-58%
39-9041	\$44,637	\$43,000-\$42,900	\$30,300	\$31,900	\$36,000	\$40,000	47%
31-9094	\$39,213	\$33,000-\$42,900	\$29,000	\$29,600	\$31,100	\$32,600	35%
27-3043	\$38,220	\$33,000-\$42,900	\$43,700	\$51,500	\$68,200	\$88,900	-13%
23-2011	\$35,559	\$33,000-\$42,900	\$44,200	\$48,000	\$53,100	\$62,200	-20%
15-2031	\$94,064	\$70,000+	\$52,400	\$57,600	\$69,600	\$76,900	80%
13-2011	\$54,528	\$43,000-\$69,900	\$48,400	\$55,900	\$73,700	\$91,200	13%
13-1151	\$70,620	\$70,000+	\$46,400	\$54,100	\$69,400	\$88,200	52%
13-1141	\$65,583	\$55,000+	\$44,400	\$47,100	\$55,600	\$60,300	48%
13-1051	\$38,210	\$33,000-\$42,900	\$39,000	\$44,100	\$66,600	\$80,100	-2%
11-3121	\$51,240	\$43,000-\$54,900	\$103,600	\$117,200	\$134,700	\$160,200	-51%
11-3031	\$38,220	\$16,000-\$42,900	\$74,700	\$78,800	\$86,700	\$117,100	-49%

Eastern Region

Table 6: Comparison of WSDOT salary in the Eastern region to average by SOC

Salary Comparisons - Eastern Region							
SOC	WSDOT Median SFY 2019-2020	WSDOT Pay Ranges	Entry-Level	25th Percentile	Median	75th Percentile	WSDOT Median vs. Entry-Level
49-9071	\$36,519	\$16,000-\$54,900	\$31,500	\$33,500	\$41,700	\$53,400	16%
49-9041	\$30,965	\$16,000-\$42,900	\$39,900	\$44,600	\$54,600	\$71,900	-22%
49-9045	\$30,965	\$16,000-\$42,900	\$40,500	\$45,800	\$55,900	\$65,400	-24%
49-9044	\$27,051	\$20,000-\$69,900	\$32,700	\$35,200	\$55,600	\$62,100	-17%
49-9043	\$21,925	\$16,000-\$54,900	\$36,100	\$39,500	\$49,400	\$66,300	-39%
43-5053	\$37,464	\$33,000-\$42,900	\$35,600	\$37,600	\$46,100	\$60,700	5%
43-4031	\$32,406	\$25,000-\$42,900	\$36,000	\$40,200	\$47,400	\$56,300	-10%
43-3021	\$21,730	\$100-\$15,900	\$32,100	\$34,000	\$38,400	\$44,900	-32%

North Central Region

Table 7: Comparison of WSDOT salary in the North Central region to average by SOC

Salary Comparisons - North Central Region							
SOC	WSDOT Median SFY 2019-2020	WSDOT Pay Ranges	Entry-Level	25th Percentile	Median	75th Percentile	WSDOT Median vs. Entry-Level
51-5113	\$45,096	\$43,000-\$54,900	\$29,600	\$30,300	\$35,800	\$46,500	52%
49-9071	\$19,675	\$16,000-\$42,900	\$31,800	\$34,000	\$41,800	\$53,900	-38%
49-9041	\$34,014	\$33,000-\$42,900	\$41,000	\$46,900	\$63,800	\$94,700	-17%
49-9045	\$34,014	\$33,000-\$42,900	\$43,800	\$49,600	\$60,200	\$70,000	-22%
49-9044	\$25,107	\$20,000-\$69,900	\$51,800	\$56,500	\$71,100	\$80,000	-52%
49-9043	\$40,110	\$16,000-\$54,900	\$40,200	\$44,900	\$55,500	\$67,000	0%
43-5053	\$29,449	\$25,000-\$32,900	\$35,700	\$38,900	\$56,300	\$57,600	-18%
43-4031	\$38,898	\$33,000-\$42,900	\$38,500	\$42,700	\$51,000	\$59,900	1%

Northwest Region

Table 8: Comparison of WSDOT salary in the Northwest region to average by SOC

Salary Comparisons - Northwest Region							
SOC	WSDOT Median SFY 2019-2020	WSDOT Pay Ranges	Entry-Level	25th Percentile	Median	75th Percentile	WSDOT Median vs. Entry-Level
51-5113	\$47,565	\$43,000-\$54,900	\$34,800	\$37,200	\$44,800	\$55,600	37%
49-9095	\$62,292	\$55,000-\$69,900	\$35,500	\$37,500	\$42,200	\$54,600	75%
49-9071	\$46,864	\$43,000-\$54,900	\$34,700	\$37,800	\$48,300	\$61,500	35%
49-9051	\$67,236	\$55,000-\$69,900	\$63,400	\$78,700	\$99,000	\$116,100	6%
49-9041	\$42,900	\$33,000-\$42,900	\$47,200	\$54,200	\$66,800	\$83,400	-9%
49-9045	\$42,900	\$33,000-\$42,900	\$48,200	\$54,400	\$65,400	\$75,800	-11%
49-9044	\$58,926	\$25,000-\$69,900	\$52,300	\$60,300	\$86,800	\$114,200	13%
49-9043	\$52,536	\$33,000-\$69,900	\$41,000	\$46,700	\$61,200	\$73,200	28%
49-3050	\$48,480	\$43,000-\$54,900	\$34,600	\$37,700	\$46,400	\$59,700	40%
43-5053	\$40,140	\$33,000-\$42,900	\$40,700	\$45,700	\$62,400	\$63,800	-1%
43-4031	\$39,204	\$20,000-\$54,900	\$48,300	\$52,600	\$59,600	\$66,600	-19%
43-3099	\$55,163	\$55,000-\$69,900	\$32,500	\$34,500	\$46,700	\$57,800	70%
43-3041	\$31,153	\$16,000-\$54,900	\$29,500	\$29,700	\$31,600	\$35,300	6%
13-2011	\$63,970	\$55,000-\$69,900	\$58,300	\$65,100	\$80,800	\$104,000	10%
13-1051	\$44,208	\$43,000-\$54,900	\$51,100	\$58,700	\$78,900	\$105,500	-13%
11-3031	\$43,104	\$43,000-\$54,900	\$96,600	\$114,000	\$145,800	\$183,700	-55%

Olympic Region

Table 9: Comparison of WSDOT salary in the Olympic region to average by SOC

Salary Comparisons - Olympic Region							
SOC	WSDOT Median SFY 2019-2020	WSDOT Pay Ranges	Entry-Level	25th Percentile	Median	75th Percentile	WSDOT Median vs. Entry-Level
51-5113	\$49,924	\$43,000-\$69,900	\$31,500	\$33,500	\$40,300	\$50,800	58%
49-9095	\$54,403	\$43,000-\$69,900	\$32,800	\$34,600	\$39,100	\$50,900	66%
49-9094	\$45,289	\$43,000-\$54,900	\$45,200	\$51,100	\$63,900	\$74,200	0%
49-9071	\$43,117	\$33,000-\$54,900	\$32,200	\$34,900	\$45,600	\$58,200	34%
49-9041	\$34,870	\$33,000-\$42,900	\$44,300	\$50,800	\$63,100	\$76,600	-21%
49-9045	\$34,870	\$33,000-\$42,900	\$44,300	\$50,200	\$60,700	\$70,700	-21%
49-9044	\$53,671	\$43,000-\$69,900	\$46,100	\$53,600	\$73,200	\$96,500	16%
49-9043	\$46,187	\$33,000-\$54,900	\$37,800	\$42,800	\$55,400	\$67,400	22%
43-6010	\$36,528	\$33,000-\$42,900	\$35,000	\$38,600	\$46,800	\$56,600	4%
43-5053	\$37,375	\$33,000-\$42,900	\$36,900	\$41,000	\$57,600	\$58,900	1%
43-4031	\$39,239	\$33,000-\$42,900	\$43,700	\$47,300	\$53,400	\$60,800	-10%
39-9041	\$53,592	\$43,000-\$54,900	\$30,800	\$32,100	\$36,600	\$43,200	74%

South Central Region

Table 10: Comparison of WSDOT salary in the South Central region to average by SOC

Salary Comparisons - South Central Region							
SOC	WSDOT Median SFY 2019-2020	WSDOT Pay Ranges	Entry-Level	25th Percentile	Median	75th Percentile	WSDOT Median vs. Entry-Level
51-5113	\$46,458	\$43,000-\$54,900	\$31,000	\$32,800	\$38,700	\$49,800	50%
49-9094	\$46,188	\$43,000-\$54,900	\$35,200	\$40,700	\$56,800	\$70,100	31%
49-9071	\$39,213	\$33,000-\$42,900	\$32,400	\$34,900	\$44,600	\$56,100	21%
49-9041	\$31,758	\$25,000-\$32,900	\$42,400	\$46,600	\$57,200	\$74,900	-25%
49-9045	\$31,758	\$25,000-\$32,900	\$42,400	\$48,000	\$58,300	\$68,000	-25%
49-9044	\$48,795	\$43,000-\$69,900	\$45,000	\$52,800	\$72,000	\$87,200	8%
49-9043	\$42,060	\$33,000-\$54,900	\$37,700	\$43,100	\$52,400	\$68,200	12%
49-3050	\$46,187	\$43,000-\$54,900	\$30,300	\$31,700	\$38,800	\$49,500	52%
43-5053	\$38,847	\$33,000-\$42,900	\$36,700	\$39,400	\$53,700	\$59,900	6%

Southwest Region

Table 11: Comparison of WSDOT salary in the Southwest region to average by SOC

Salary Comparisons - Southwest Region							
SOC	WSDOT Median SFY 2019-2020	WSDOT Pay Ranges	Entry-Level	25th Percentile	Median	75th Percentile	WSDOT Median vs. Entry-Level
49-9095	\$59,436	\$55,000-\$69,900	\$29,600	\$30,200	\$36,600	\$45,600	101%
49-9071	\$41,184	\$33,000-\$54,900	\$31,100	\$33,100	\$42,400	\$53,700	32%
49-9041	\$34,860	\$33,000-\$42,900	\$47,400	\$54,800	\$65,300	\$77,900	-26%
49-9045	\$34,860	\$33,000-\$42,900	\$41,600	\$47,200	\$57,400	\$67,100	-16%
49-9044	\$51,240	\$43,000-\$54,900	\$44,200	\$49,400	\$62,000	\$73,100	16%
49-9043	\$45,870	\$33,000-\$53,900	\$38,500	\$42,800	\$51,900	\$65,900	19%
49-3050	\$45,288	\$43,000-\$54,900	\$31,700	\$34,100	\$42,400	\$53,200	43%
43-4031	\$36,042	\$33,000-\$43,900	\$37,700	\$40,900	\$47,000	\$53,900	-4%

Demographic Comparisons

Due to the limited number of hires in some SOC codes and the small percentage of individuals who identified as women (27%) or people of color (12%), this analysis was conducted statewide rather than by region. Averaging across all new hires, we see that female hires earned \$2,552 more than male hires and people of color hires earned \$1,764 more than White hires, on average.

Table 12: Average statewide salary by demographic

Average New-Hire Salary by Demographics (SFY 2019-2020)			
Women	Men	People of Color	White
\$53,347	\$50,795	\$53,023	\$51,260

While these high-level averages are useful, they do not account for the differing demographic distributions by job. To account for this, the mean and median salary was calculated for women, men, people of color, and White hires by SOC code. Comparisons were then made to identify any gaps in compensation by gender or race/ethnicity.

- Gender
 - In 47% of sectors, the median salary of female hires was greater than for male hires
- Race/Ethnicity
 - In 53% of sectors, the median salary for hires of people of color was greater than for White hires

Given this roughly 50/50 likelihood of the median being higher/lower, the data suggests that there are not consistent differences in compensation by gender or race/ethnicity. Much of the differences are likely the result of small sample sizes for subgroups and the associated large margins of error.

Table 13: Average WSDOT salary by gender and race per SOC

WSDOT Employee Compensation by Gender and Race												
SOC	Women		Men		Gender Gaps		People of Color		White		Race/Ethnicity Gaps	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
51-5113	n/a	n/a	\$48,508	\$47,012	n/a	n/a	\$45,096	\$45,096	\$49,190	\$47,565	-8%	-5%
49-9095	\$59,436	\$59,436	\$60,237	\$62,069	-1%	-4%	\$60,346	\$62,148	\$60,049	\$60,713	0%	2%
49-9094	n/a	n/a	\$46,319	\$46,188	n/a	n/a	n/a	n/a	\$46,319	\$46,188	n/a	n/a
49-9071	\$41,278	\$40,110	\$35,213	\$38,983	17%	3%	\$33,008	\$38,210	\$36,066	\$39,209	-8%	-3%
49-9051	n/a	n/a	\$67,236	\$67,236	n/a	n/a	\$67,236	\$67,236	n/a	n/a	n/a	n/a
49-904X (49-9041, 49-9045)	\$33,794	\$30,965	\$34,921	\$34,860	-3%	-11%	\$42,900	\$42,900	\$33,423	\$32,082	28%	34%
49-9044	\$54,306	\$55,174	\$45,811	\$51,240	19%	8%	\$44,124	\$47,625	\$46,318	\$51,240	-5%	-7%
49-9043	\$45,366	\$45,192	\$40,385	\$44,203	12%	2%	\$39,357	\$44,208	\$40,859	\$44,203	-4%	0%
49-3050	\$46,187	\$46,187	\$46,884	\$46,884	-1%	-1%	n/a	n/a	\$46,652	\$46,187	n/a	n/a
43-6010	n/a	n/a	\$36,528	\$36,528	n/a	n/a	n/a	n/a	\$36,528	\$36,528	n/a	n/a
43-5053	\$37,082	\$37,378	\$24,247	\$24,247	53%	54%	n/a	n/a	\$35,249	\$37,375	n/a	n/a
43-4031	\$38,232	\$39,204	\$45,096	\$45,096	-15%	-13%	\$39,686	\$40,194	\$38,282	\$39,204	4%	3%
43-3099	\$55,163	\$55,163	n/a	n/a	n/a	n/a	n/a	n/a	\$55,163	\$55,163	n/a	n/a
43-3041	\$27,618	\$32,400	\$43,243	\$43,243	-36%	-25%	\$33,372	\$33,372	\$28,714	\$32,400	16%	3%
43-3031	\$30,491	\$32,604	n/a	n/a	n/a	n/a	n/a	n/a	\$30,491	\$32,604	n/a	n/a
43-3021	\$51,232	\$51,232	\$14,623	\$14,623	250%	250%	\$28,877	\$28,877	\$14,623	\$14,623	97%	97%
39-9041	\$49,115	\$49,115	n/a	n/a	n/a	n/a	n/a	n/a	\$49,115	\$49,115	n/a	n/a
39-9021	\$50,012	\$50,012	\$37,464	\$37,464	33%	33%	n/a	n/a	\$45,829	\$48,792	n/a	n/a
31-9094	n/a	n/a	\$39,213	\$39,213	n/a	n/a	n/a	n/a	\$39,213	\$39,213	n/a	n/a
27-3043	n/a	n/a	\$38,220	\$38,220	n/a	n/a	n/a	n/a	\$38,220	\$38,220	n/a	n/a
23-2011	\$36,553	\$35,559	\$37,445	\$35,559	-2%	0%	\$35,421	\$35,559	\$39,331	\$41,217	-10%	-14%
15-2031	\$94,064	\$94,064	n/a	n/a	n/a	n/a	n/a	n/a	\$94,064	\$94,064	n/a	n/a
15-1150	\$68,724	\$68,736	\$63,041	\$66,234	9%	4%	\$65,580	\$65,580	\$64,855	\$67,812	1%	-3%
15-1142	n/a	n/a	\$89,112	\$89,112	n/a	n/a	\$79,452	\$79,452	\$98,772	\$98,772	-20%	-20%
15-1141	\$62,160	\$62,160	\$78,595	\$79,548	-21%	-22%	\$62,160	\$62,160	\$78,595	\$79,548	-21%	-22%
15-1134	n/a	n/a	\$64,560	\$64,008	n/a	n/a	n/a	n/a	\$64,560	\$64,008	n/a	n/a
15-1132	n/a	n/a	\$84,930	\$86,604	n/a	n/a	\$108,912	\$108,912	\$80,134	\$79,140	36%	38%
15-1131	n/a	n/a	\$45,774	\$45,644	n/a	n/a	\$46,187	\$46,187	\$45,637	\$45,101	1%	2%
13-2051	\$55,374	\$55,374	n/a	n/a	n/a	n/a	n/a	n/a	\$55,374	\$55,374	n/a	n/a
13-2011	\$56,167	\$55,152	n/a	n/a	n/a	n/a	\$55,152	\$55,152	\$56,421	\$55,236	-2%	0%
13-1151	\$70,520	\$70,620	\$73,299	\$73,299	-4%	-4%	n/a	n/a	\$71,631	\$70,620	n/a	n/a
13-1141	n/a	n/a	\$65,583	\$65,583	n/a	n/a	n/a	n/a	\$65,583	\$65,583	n/a	n/a
13-1051	\$41,209	\$41,209	n/a	n/a	n/a	n/a	\$44,208	\$44,208	\$38,210	\$38,210	16%	16%
11-3121	\$50,703	\$51,240	\$49,851	\$49,851	2%	3%	n/a	n/a	\$50,460	\$51,240	n/a	n/a
11-3031	\$34,149	\$37,830	\$38,051	\$38,717	-10%	-2%	n/a	n/a	\$36,100	\$38,717	n/a	n/a

Income

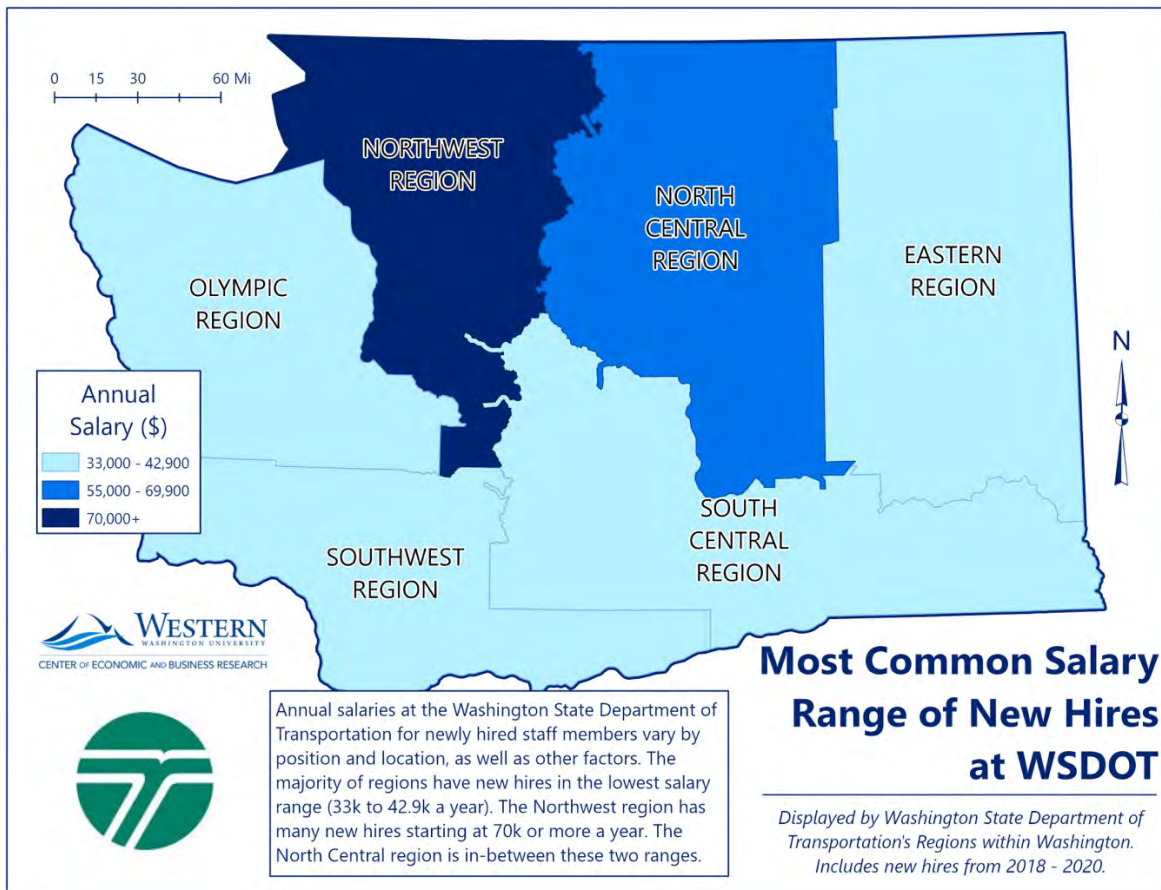
This section details the number of new hires for eight different salary ranges at WSDOT. The salary ranges are split into three groups, top two, middle three, and bottom three. The Center used internal WSDOT data to disaggregate the number of new hires in each salary range across all six regions of the state. From this analysis, the key findings are:

- The Northwest Region has significantly higher starting salaries compared to the other five regions in the state.
- Using regional cost of living data, the North Central Region has higher than expected average income while the Southwest and Olympic Regions have average incomes that are lower than expected.
- There were more new hires in the \$70,000 of higher salary range than the \$55,000 to \$69,900 salary range for all regions excluding the Northwest Region.
- The Eastern Region had the highest number of new hires in the \$25,000 to \$32,900 salary range
- In the \$33,000 to \$42,900 salary range, the Northwest Region had largest number of new hires.
- The Northwest and Olympic Regions had the highest number of new hires in the \$43,000 to \$54,900 salary range.
- For the bottom three salary ranges at WSDOT, the \$20,000 to \$24,900 salary range had the highest number of new hires.
- The Eastern Region has the highest number of new hires in the \$16,000 to \$19,900 salary range
- The South Central Region had the highest number of new hires in the \$1-\$15,900 salary range.

Most Common Salary Range of New Hires at WSDOT

The map below shows the most common salary range for new hires at WSDOT all six regions in the state. The Northwest Region has the highest salary for new hires, starting at \$70,000 annually. However, most of the regions have new hire starting salaries ranging from \$33,000 to \$42,900 annually. While starting salaries will certainly vary based on the position itself, and other outside factors, there is a noticeable difference in the starting salaries between new hires in the Northwest Region and the rest of the state. In some instances, the starting salary in the Northwest is twice as high as the starting salary in the Olympic, Southwest, South Central, and Eastern Regions.

Figure 10: Map of most common salary range for WSDOT new hires by region



Comparing average annual salaries to regional cost of living, we see that the North Central region has a higher-than-expected average income and the Southwest and Olympic regions have lower-than-expected average incomes.

Table 14: Cost of living by region compared to US average

Cost of Living by Region							
United States	Washington	East	North Central	Northwest	Olympic	South Central	Southwest
100.0	131.1	106.2	103.1	151.9	117.6	102.3	124.4

Source: Council for Community and Economic Research, <https://www.coli.org/participants/>

Number of New Hires Within Each Annual Salary Group at WSDOT – Top Two Salary Groups

The top two salary groups at WSDOT are composed of employees who earn \$70,000 or more annually, and employees who earn between \$55,000 and \$69,900 annually. This map shows how many new hires were made in each salary range for each region in the state. Interestingly, aside from the Northwest region, in each region there were more new hires in the \$70,000 or higher salary range than the \$55,000 to \$69,900 salary range. This does not necessarily point to any problems within the agency or cause for concern since salary is highly dependent on a variety of factors, however, it is an interesting pattern. The Northwest Region had the highest number of new hires for both salary ranges, while the South Central Region had the lowest number of new hires in both salary ranges.

Number of New Hires Within Each Annual Salary Group at WSDOT – Middle Three Salary Groups

Similar to the previous map, this map shows the number of new hires in the middle three salary groups at WSDOT. The middle three salary groups are composed of salary ranges of \$25,000 to \$32,900, \$33,000 to \$42,900, and \$43,000 to \$54,900. For the \$25,000 to \$32,900 salary range, the Eastern Region had the highest number of new hires, and besides the Southwest Region which had no new hires in this range, the Northwest and Olympic Regions had the lowest numbers of new hires in this range. The Northwest Region had the highest number of new hires in the \$33,000 to \$42,900 range while the Southwest Region had the lowest. Finally, the \$43,000 to \$54,900 salary range had the highest number of new hires. The Northwest and Olympic Regions had the highest number of new hires in this range, hiring between 56-172 new employees.

Number of New Hires Within Each Annual Salary Group at WSDOT – Bottom Three Salary Groups

The last group of salary ranges is made up of the bottom three salary groups at WSDOT. These salary groups range from \$1 to 15,900, \$16,00 to \$19,000, and \$20,000 to \$24,900. The salary group with the highest number of new hires is the \$20,00 to \$24,900 salary range. For this range, the North Central and Eastern Regions had the highest number of new hires. For the \$16,000 to \$19,900 salary range, the Eastern Region again had the highest number of new hires while the Northwest region had the lowest (excluding the Southwest Region which had no new hires in this salary group). Lastly, the South Central Region had the highest number of new hires in the \$1-\$15,900 salary range. The Northwest and North Central region did not have any new hires in this range.

Figure 11: Map of new WSDOT hires in the top two salary groups

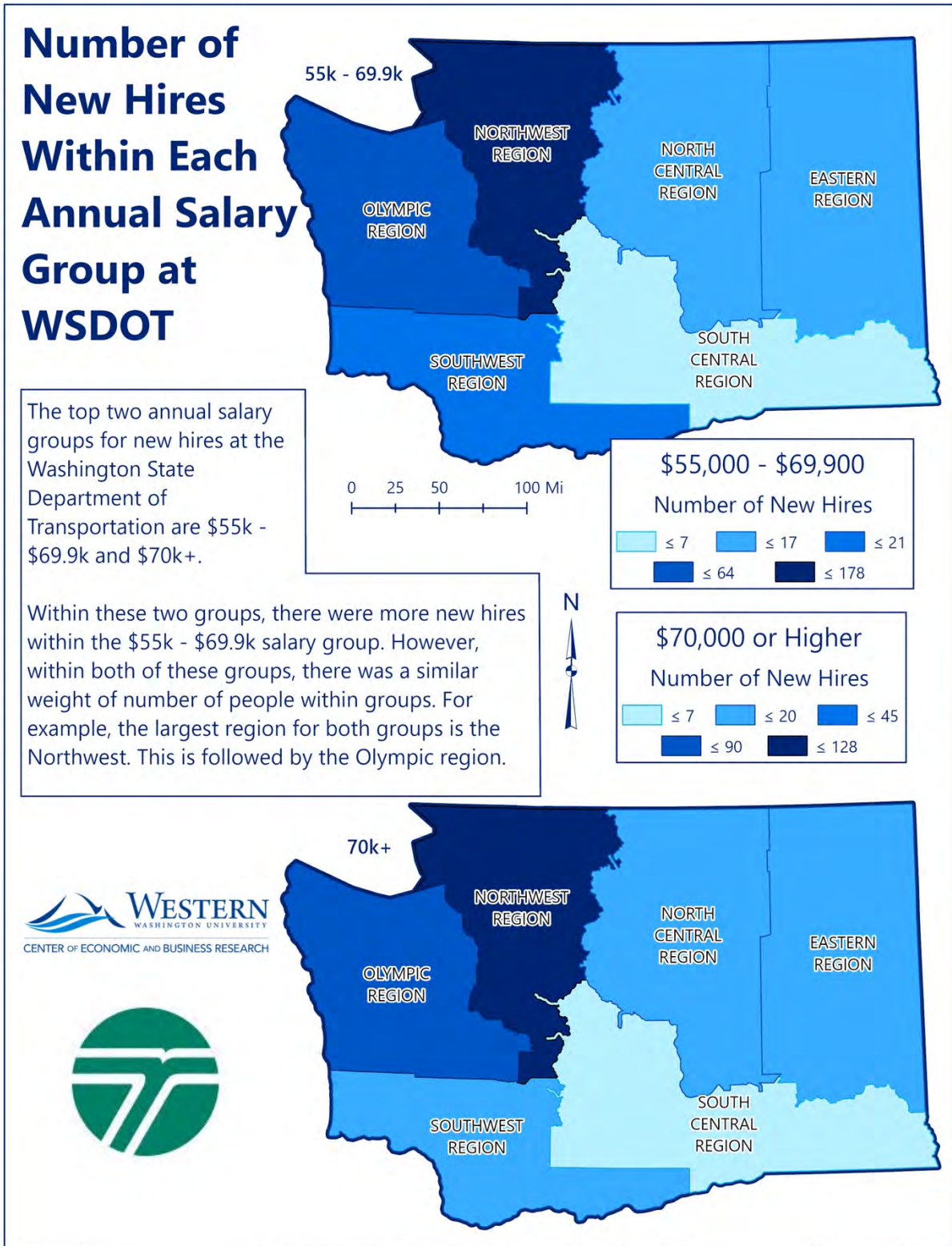


Figure 12: Map of new WSDOT hires in the middle three salary groups

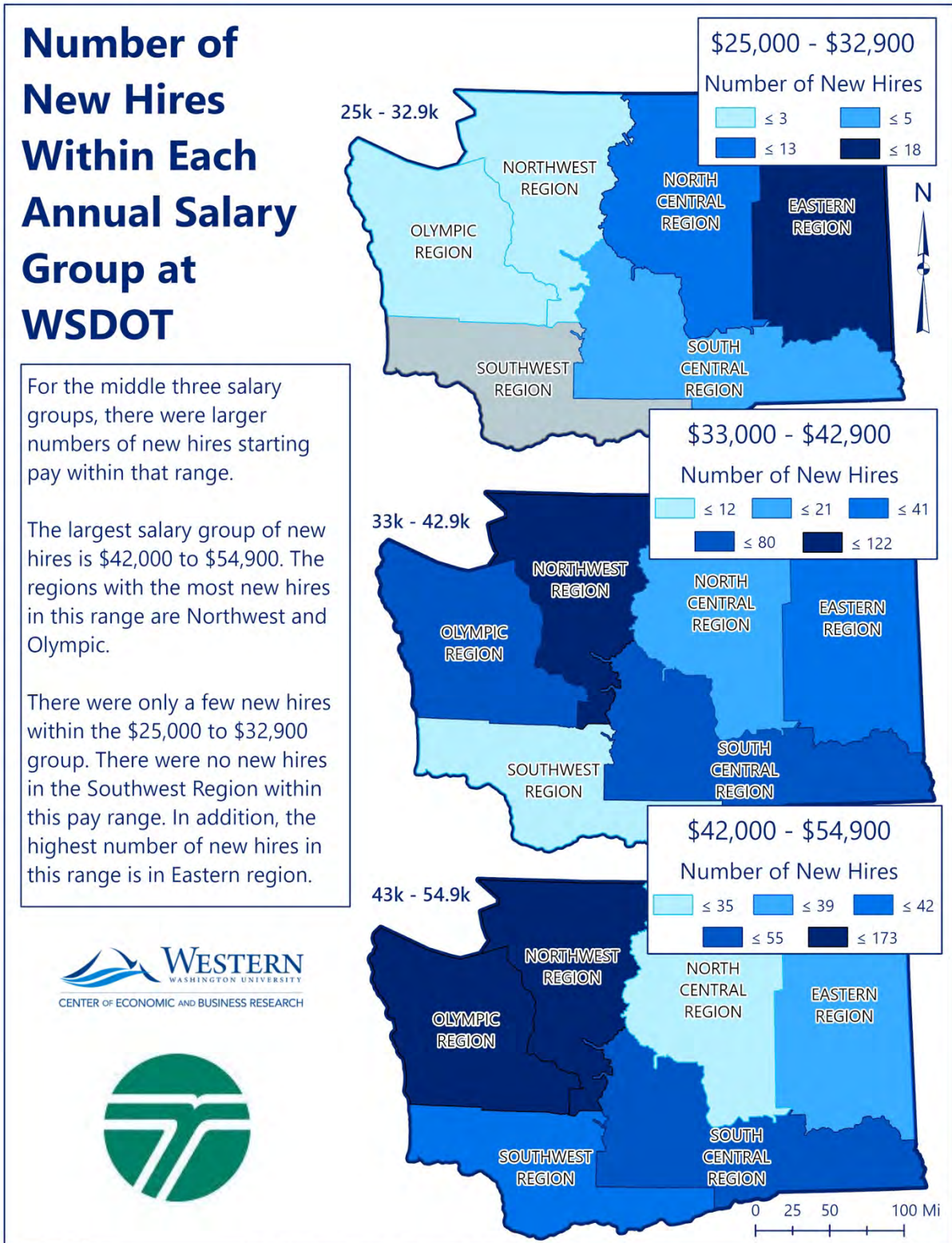
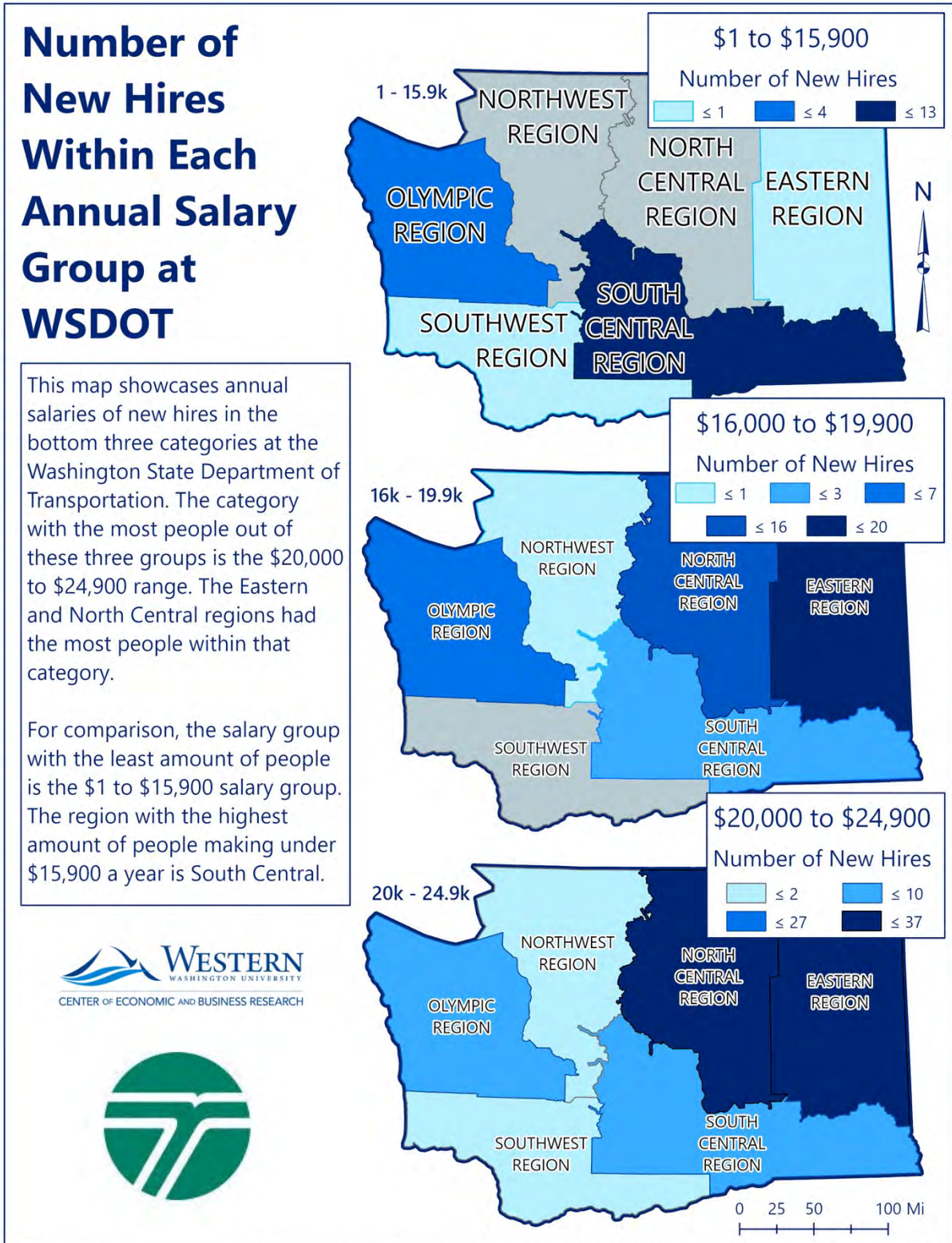


Figure 13: Map of new WSDOT hires in the bottom three salary groups



Question 4 – Distribution of Benefits for Transportation Investments

This annotated bibliography attempts to answer the question: What value and benefits do different income and racial groups receive from the transportation system investments? In answering this question, much of the research was targeted more at what groups are not receiving the value and benefits of transportation system investments, rather than who was benefiting and what value they were receiving. The focus of these sources explores equity concerns in places where transportation investments have already been made and whether they are serving the people who need them the most. Many did this through assessing transportation accessibility and demographics of the areas surrounding transportation stations over time. There were also many sources focusing on equitable transportation planning. Although they often did not discuss specifics on types of investments, they gave a solid foundation to assess whether future or current projects are being equitable and are therefore useful in answering this question in the future.

The overall findings show that transportation is becoming highly automobile based, therefore investment tends to favor roadways and other projects that decrease traffic congestion and otherwise improve road conditions. In favor of roadways, one source finds that investing in highway infrastructure may lead to lower income inequality. However, while many use cars, this is disadvantageous to low-income individuals who are unable to afford the prohibitive cost of automobiles. To correct for this, some sources find that active transportation is a way to increase access for disadvantaged groups and fill gaps in public transportation services. Investments such as bikeshare programs are beneficial for health too, however, a few sources find that they are not being equitably placed and therefore mainly still serving white and higher income groups, despite targeting specific populations. Active transportation also highlights the connection between public health and equitable transportation, meaning these disparities seen in transportation also result in disparities in health.

Non-White and low-income groups use public transit the most but often have the least access and since transportation priority is placed on automobiles, they benefit the least. Investment is not being allocated for these groups, rather it is focused where there is the most public interest, which is often rail over bus, whose users come from White and higher income groups. These rail stations can lead to gentrification of the surrounding neighborhoods by increasing house prices.

Another issue with highways being the prevalent form of transportation, is the environmental concerns for populations that live near them. The pollution from high volumes of traffic can have negative effects on surrounding communities, and these communities are often low-income and/or communities of color. An effective investment idea to reduce pollution harm, is to reroute freeways to go around neighborhoods.

The following annotated bibliography is organized into 6 topics: Active Transportation Investments, Accessibility and Mobility, Highways, Freeways, and Roads, Bus and Rails, Environmental Justice, and Equitable Planning and Policies for Transportation Investments.

Active Transportation Investments

Ursaki, J., & Aultman-Hall, L. (2015, January 6).
*Quantifying the Equity of Bikeshare Access in
U.S. Cities* (Tech. No. 15-011). Retrieved
<https://rosap.ntl.bts.gov/view/dot/36739>

Bikeshare programs have potential to increase access. This article addresses whether this access is available for low income and different racial groups.

Bikeshare programs have been increasingly implemented into transportation systems over recent years due to their positive effects on the environment and health. In other studies, the authors reviewed, they found that most of the people who use bikeshare programs are White, male, and middle to higher income. Other previous research mimics this, indicating that only a small portion of those who use bikeshare programs are from income deprived areas. These studies shaped the research question of this paper, since much of the research showed that bikeshare users were not representative of the population.

This paper focuses on the equity implications of these new systems, specifically researching whether these bikeshare programs are accessible for those marginalized groups that typically do not have great access to transportation and do not have automobiles. To accomplish this, they use spatial analysis of geographic areas where the bikeshare programs are established and where they are not, within cities that have implemented them. These cities include NYC, Boston, Washington DC, Arlington, Chicago, Denver, and Seattle. The social and economic variables they examined in these areas were population, race, age, education level, and income.

When looking at the Census blocked groups for each city, they found that a larger percent of White people had access to bikeshare programs than the percent of African American people for all cities except Washington D.C. A commonality between all the cities was that the percent of people that were college educated was greater in bikeshare areas than those who were not. In all cities except for Seattle, they also found a larger percent of people who made more than \$100,000 than who made less than \$20,000 in bikeshare areas.

In Boston, NYC, Chicago, Denver, and Seattle, there was also on average a larger percent of African Americans that lived outside of bikeshare service areas than inside, and that there was on average a larger percent of White people living inside these bikeshare service areas than outside. Overall, their results give data-based reinforcement about the inequity of bikeshare programs that other literature suggests. This analysis shows that while bikeshare services appear to be placed in areas with the highest population density, they are limiting access to disadvantaged groups.

While active transportation has many benefits and can increase access, this article shows how the goals associated with developing active transportation project often takes more than just investment.

Auchincloss, A. H., Michael, Y. L., Kuder, J. F., Shi, J., Khan, S., & Ballester, L. S. (2019). Changes in physical activity after building a greenway in a disadvantaged urban community: A natural experiment. *Preventive Medicine Reports, 15*. <https://doi.org/10.1016/j.pmedr.2019.100941>

An urban greenway was implemented in 2013 in a low-income, predominantly African American community that also had high crime rates located in Philadelphia, Pennsylvania. This development meant including more sidewalks and other pedestrian and bicyclist improvements. Their goal was to provide more access to the parks and recreation facilities in their area that were not being used. Another use was to aid in transportation infrastructure. The hope is that greenways will improve public health, since low-income groups are more prone to chronic disease.

This paper focuses on health benefits of this greenway improvement to determine if there were any changes in physical activity. They compared the 1.5-mile area, where the greenway was developed, to another 1.5-mile area in another section of the community with similar demographics and environment. Surveys were conducted before and after implementation of the greenway. To measure physical activity, they used a direct systematic observation method, that looked at whether individuals were participating in a high intensity or low intensity activity. They had a total of 8,783 people that they logged. They also had a survey that 175 greenway users participated in, asking questions to determine factors such as purpose for using the greenway. They also looked at automated pedestrian and bicycle counts, census data, and crime incidents. They then used descriptive statistics in their analysis.

They found only slight increases in use and physical activity, that did not seem to differ from trends in the control group. They also did not see any improvement in crime rate, due to the greenway. Many of the greenway users lived in the neighborhood and used it daily. While they found the greenway useful for residents to get to a destination, they did not use it for exercising more. They suggest that what this case study shows, is that factors such as perceived crime, can influence and cause individuals to not use the greenway despite the benefits and that to increase physical activity, these larger problems need to be addressed first.

McKenzie, B.S. (2013), *Neighborhood Access to Transit by Race, Ethnicity, and Poverty in Portland, OR*. *City & Community*, 12: 134-155.
<https://doi.org/10.1111/cico.1202>

Equity concerns often revolve around disadvantaged group's access and mobility. More access can increase lower-income individuals' opportunities and aid in more economic development. This article looks at Portland's transit system to determine mobility by disadvantaged groups and their discussion sheds light onto whether transit investments are being equally placed.

This study aims to test the spatial mismatch hypothesis by examining public transit for differing Census block groups in Portland, Oregon. The spatial mismatch hypothesis predicts that when jobs move outside of cities, there will be a negative effect on low income and racial groups that are residentially segregated. Portland is an area of interest for this study because of their history of redlining and gentrification.

They specifically look at block groups that have large populations of residents who use public transportation and that have comparatively large percentages of Latino, Black, or low-income populations. They also use GIS data for transit route choice, which is used as their dependent variable. Instead of using a typical Euclidean measure of distance to transit, they use average walking distance to transit for all households in the block area. Transit is considered accessible if it is within a half mile for light rails and one third of a mile for buses. Their analysis considers routes going both ways or only one, and how many lines there are at each transit station. Schedules of the routes, parking, and bike access were not considered.

Those who use transit the most are controlled for using four categories. Those controls are percent of the population that is of working age, percent of the population with a postsecondary degree, percent of population that are renters, and the percent of population without vehicles. Since transit route choice is not normally distributed, a Poisson regression is used instead of OLS.

The found that on average there were more accessible routes in 2000 than in 2005 or 2009, possibly due to service reductions in 2008. The group with the highest average access to transit routes was blocks with higher Black populations. Both Black and Latino block groups had significant reductions in access over the three time periods, while access for low income remained relatively stable. They suggest that this reduction could be due to decentralization and groups moving away from hubs of transportation into suburbs. They argue that most of the transportation within cities are in the areas with the most gentrification, therefore from an equity standpoint, transit needs to be assessed by how much accessibility each group has to it. Transit has the power to connect low-income groups to some of the benefits that come with wealthier neighborhoods, with one example being jobs.

Within accessibility, job accessibility is one of the most important variables for economic opportunity. This paper explores job accessibility by public transportation.

Yeganeh, A., Hall, R., Pearce, A., & Hankey, S. (2018). A social equity analysis of the U.S. public transportation system based on job accessibility. *Journal of Transport and Land Use*, 11(1), 1039-1056. Retrieved April 19, 2021, from <https://www.jstor.org/stable/26622444>

This article discusses how the shift of transportation organizations' focus to car-based forms of transportation brings into question accessibility for those who are unable to afford a vehicle. Their research focuses on assessing transit equity and accessibility. To do this they examined 45 cities across the United States using two indicators. For each city, the indicators they used were the Gini index of cumulative accessibility and the difference in accessibility between low-income non-Whites and high-income Whites. The Gini index is typically used to measure income inequality however, many other studies use the Gini index as an index for transit equality.

The data comes from two different datasets. One is transit job accessibility data from 2014, that examines travel times, using a trip planning tool, from 7:00-9:00 am. The other data was demographic data from the U.S. Census Bureau, specifically looking at income and race.

Using a regression, they found that low income and non-White groups used public transportation more to get to their jobs. They also found that in larger cities, such as New York and Chicago, high income groups had higher job accessibility. In most other cities they found the opposite to be true, due to higher income, mostly White groups not needing transit because they have cars and live in the suburbs. In some cities they also found that within lower income groups, accessibility differed based on whether the communities were mainly White or non-White. Some cities also showed that there was lower transit accessibility for groups that had limited English speaking ability. In their discussion, they say while investment for transit increases, usage seems to be decreasing. Considering the cost of using public transportation may lead to more diverse levels of job accessibility than the data that they used.

Hooper, Emma and Peters, Sanjay and Pintus, Patrick, To What Extent Can Long-Term Investment in Infrastructure Reduce Inequality? (March 2017). Banque de France Working Paper No. 624, Available at SSRN: <https://ssrn.com/abstract=2952365> or <http://dx.doi.org/10.2139/ssrn.2952365>

While the findings within the literature show that our transportation systems have become highly car dependent, this paper suggests that highway infrastructure investment may lead to lower inequality.

This paper examines the relationship between infrastructure investment and income inequality. While there has been extensive research done about inequality and economic growth, there is insufficient research about the effects of income inequality and overall wellbeing in relation to infrastructure. They use US state level data from 1950 to 2010 to test this. Income inequality is measured by the Gini coefficient, breaking down the data into top 40% and bottom 40%. The measurement for infrastructure is by expenditure collected from the US Census Bureau every 10 years and the two variables taken from this dataset to be used in the regression were highways and education. They use a panel regression to determine if the differing Gini coefficients (top or bottom) have any relation to past infrastructure investments.

The result from this regression shows that highway spending had a larger effect for the bottom Gini coefficient group than the top. Comparing the importance of highway and education spending, they found highway spending to have a stronger relationship to inequality than education.

Since this data focuses on past values of infrastructure investment, their findings suggest that increases in highway investment leads to lower inequality 10 years later (keeping in mind the data is measured every 10 years). To test the validity of their argument, since often research will assume that higher inequality will lead to lower future infrastructure spending, they examined the relationship with infrastructure spending as the dependent variable and did not find anything significant, indicating that future infrastructure spending does not rely on past inequality levels. Their findings suggest that investing in infrastructure (specifically highways and education) might have positive impacts on income inequality.

This article focuses on the equity implications of roadways. This can help inform where roadway investment needs to go to benefit minority communities.

**Morency P., Gauvin L., Plante C., Fournier M., Morency C.
Neighborhood Social Inequalities in Road Traffic Injuries:
The Influence of Traffic Volume and Road Design. *Am. J. Public Health.* 2012;102:1112–1119. doi:
10.2105/AJPH.2011.300528.**

This study explores whether road and traffic injuries differ by socioeconomic inequalities. They specifically focus on whether these differences in road and traffic injuries are due to traffic volume and road geometry. Their analysis took place in Montreal. They look at road injuries between January of 1999 to December of 2003, specifically injuries that happened at intersections. The locations of the injuries were mapped using the program Arc Info. Roads were categorized into minor or major roads, and Census data was used to assess income. Their analysis was done using a multilevel Poisson regression.

Compared to wealthier areas, they found that there were roughly 6 times more pedestrians injured at intersections located in poor areas. They were also around four times higher for cyclists and motor vehicles. They also found a positive relationship with traffic volume and poverty, and population density was higher for low-income groups.

Since lower income populations depend more on forms of transportation other than cars because they cannot afford them, and are more densely populated, they are more exposed to injury. There was also a positive relationship between number of vehicles per day at intersections and injuries. Another finding was that more injuries happened at intersections with one or more major roads. Overall, the results showed that wealthier intersections had fewer injuries due to road geometry, traffic, and pedestrian activity than poorer intersections. Their suggestions for correcting this include investing in public transportation to reduce traffic volume, focusing on reducing traffic and road redesign in poor urban communities.

Patterson, R. F., & Harley, R. A. (2019). Effects of Freeway Rerouting and Boulevard Replacement on Air Pollution Exposure and Neighborhood Attributes. *International journal of environmental research and public health*, 16(21), 4072. <https://doi.org/10.3390/ijerph16214072>

Highway investment can also come in the form of rerouting freeways. The previous article briefly discusses traffic volume and how that can lead to more accidents. Elevated levels of traffic volume can also have other negative effects on neighborhoods located close to freeways, such as pollution. This article explores the effects of rerouting a freeway on the surrounding community.

In response to the discussion of using freeway removal to reverse the disproportionate negative environmental and health impacts on low income and minority groups, this study explores freeway removal effects on air quality and gentrification effects. While removing freeways undoes future harm for the surrounding communities, there is concern that it will also lead to gentrification due to rising house prices. To assess this, they look at the Cypress freeway in West Oakland that went through a rerouting process that was completed in 2005. The old freeway was replaced with the Mandela Parkway, which is now a boulevard.

They predicted levels of NO_x, near-roadway nitrogen oxides, and BC, black carbon, for the freeway plan that was completed as well as rejected plan that would have kept the original freeway, using traffic volume counts and estimates of vehicle emissions. Traffic counts came from the California Department of Transportation and the City of Oakland. Vehicle emissions were estimated using an EMFAC model. The concentrations of air pollutants were then predicted using a RLINE line-source dispersion model. To answer the second part of their question, they gathered demographics from Census data and used GIS to assess changes in neighborhoods.

They found that the reroute caused great reductions in air pollutants in the middle of West Oakland where the freeway had originally gone through, although the reductions were larger for NO_x than they were for BC, possibly due to BC not decaying as quickly. Traffic volume after the rerouted freeway was also lower than the freeway that went through the neighborhood.

From 1990 to 2010, the non-White population decreased by 11.4% in all West Oakland and 9.1% within 250m of the Mandela Parkway, but the largest decrease was specifically for the Black population decreasing by 23.2 and 28.3, respectively. During the same period, house values increased 136% in all West Oakland and 184% near the Mandela Parkway.

Their results show that by rerouting the freeway, air quality increases if no part of the reroute is close to residential areas. While the air quality increases benefit residents of the neighborhood, the reroute also had the unintended consequence of displacing non-White residents and increasing home prices.

Bus and Rail

As car dependence becomes more prevalent in our transportation systems, this paper explores whether our transit systems are benefitting those who rely on it. Their results can help inform future investment decisions that would benefit low income and minority groups.

Taylor, B.D., Morris, E.A. Public transportation objectives and rider demographics: are transit's priorities poor public policy?. *Transportation* 42, 347–367 (2015). <https://doi-org.ezproxy.library.wvu.edu/10.1007/s11116-014-9547-0>

Transit is being used to combat issues such as traffic congestion, car dependence, air quality, and a multitude of others. A sizable portion of transit users are low income and racial/ethnic minorities. However, since transportation systems are no longer run privately and are ran publicly, it is questionable whether the focus is still on serving the customers, since the public, through elected officials and board members, determines transportation decisions and investment, rather than the users. This paper examines demographics of the users of different forms of transportation, the goals of these diverse types of transportation services, and whether the spending is reflecting the goals and needs identified.

First, to measure demographics, they used the National Household Travel Surveys from 1995, 2001, and 2009, to determine trends over time. For data prior to those dates, they used the National Personal Transportation Surveys from 1977, 1983, and 1990. In their analysis, they found that buses are used by low-income riders, with a median income of \$22,500. Comparing this median income with those who travel by vehicle, there is a \$40,000 difference. This has been an increasing gap between the two groups since 1977, where bus riders' incomes are continuing to decline. However, this extreme difference was not found for rail riders, where incomes for rail riders were comparable to those who drive. For transit riders in general, they found a decline over time in median incomes. They also found differences in race and ethnicity as well. Generally, the number of non-White users is increasing for all forms of transportation, but it is increasing more for transit than it is for car-based transportation. Comparing rail and bus riders again, 45% of rail riders are White, while for buses that percentage is only 29%. They suggest some of this could be due to differing incomes per capita for racial and ethnic groups, with White per capita income being the highest.

To measure goals and objectives, they checked websites for 50 fixed route transit operators in the United States that were randomly pulled from a total of 428 agencies. To confirm, they also cross referenced via email and telephone. These goals were then organized into categories, one specifically for transit-dependent policies. They find that across these organizations there is not a clear or common goal that they all share. While some of the goals mentioned are similar, they argue that many can be seen as conflicting with the idea of transportation for all. Another problem they identify with the goals mentioned, are that they are vague and measuring progress for them is ambiguous. Most of them also did not mention the needs of the poor and transit dependent.

Lastly, to analyze spending on transportation, they used the American Public Transportation and the Department of Transportation's National Transit database to collect information on mode and expenditure. While they found more bus services than rail, the rate of increase has been much faster for rail than bus and bus services have declined since the 2000s. Transit patronage did not increase in the same way services did, with overall slow increases and since 2001 bus ridership has decreased while rail ridership increased. Subsidies for all transportation have increased over time. Total subsidies for rail transit increased much faster than bus and, in 2009, total rail subsidies were more than total bus subsidies, demonstrating greater focus on rail-based transportation.

Their proposed reasoning for these results is that because transit is not cost-effective and requires subsidies to function, transit has not been able to focus on only those that they serve to maintain funding and that rail systems have more public appeal. The concern of resources being put into rail systems, is that it will take from investment from bus systems and lead to a decline in bus services. They suggest reducing transit fares for bus services to increase transportation use.

Lu, R. (2018). Does Investing in Rail Transit Benefit the Poor? A Comparative Study of Rail and Bus Travel by Low-Income Households in the California Household Travel Survey. *Transportation Research Record: Journal of the Transportation Research Board*, 2672(6), 11–20. <https://doi.org/10.1177/0361198118796738>

An increased focus has been put on light rail systems in recent years. While they are supposed to provide better transportation options, this paper explores whether these investments are helping low-income households who rely on public transportation.

There are mixed results as to whether rail systems are increasing ridership for low-income groups. This paper tries to assess how these perspectives apply for low-income groups in LA county. They use Household Travel Survey data, which contains daily trips from a random sample of 42,431 households between January 2012 and March 2013, along with demographic and socioeconomic data about the respondents. First the data was grouped by income level and mode of transportation. Then they looked at travel times for low-income groups for both bus and rail. The cut off for the low-income category is under \$35,000 a year and this cutoff is 80% below the median income in LA county.

They found that for all households, the largest number of trips was by bus. Comparatively, the percentage of total trips by bus was much higher for the low-income group, with their percentage being 82% of trips, while higher income groups was 58% of trips. For trips by rail, higher income groups had 30% of trips, while low-income groups had 12.3%. This means low-income groups use bus systems more than rail. They suggest that this could be because low-income groups use buses to get around more locally and within neighborhoods, while rail systems are used for longer trips. Since they also find that rail and bus rapid transit decrease travel time for low-income groups, they imply that this could be beneficial for job commutes.

However, there were limitations with the data, including small sample sizes for certain groups, that may have impacted the results. Acknowledging these limitations, the data suggests that although rail and rapid bus are beneficial in shorter travel times, they should not replace conventional bus systems, since low-income groups rely heavily on buses.

One other potential issue with implementing more light rail systems, is that they could cause gentrification with the areas surrounding these stations. This article explores whether this concern is valid and what effects these investments have.

Heilmann, K. (2018). Transit access and neighborhood segregation. Evidence from the Dallas light rail system. *Regional Science and Urban Economics*, 73, 237-250. doi:10.1016/j.regsciurbeco.2018.10.007

Neighborhood segregation by income has become a larger issue with rising house prices. More city public transportation investment recently aims at investing in public transport such as light rails to combat car-dependence and help impoverished neighborhoods. Those living in places that plan to invest in rail systems worry about noise, crime, and deterioration of their neighborhoods, when others argue that light rails have positive effects on neighborhoods. This study focuses on how neighborhoods change with public transportation investment by comparing neighborhoods that received transit access versus those that were promised but did not. They look specifically at changes in income.

They use a specific case study of a light rail plan in Dallas Texas in 1980, because it allows them to account for selection bias. The plan was to put in light rails and bus transit, but they lost funding partway through. This allows them to compare differences between the areas that received transit versus areas that were supposed to. They have also since added more extensions. The transit currently has mostly low-income riders and in a passenger study, about 80% of respondents earned less than the median income for the area.

The data measures neighborhood demographics and economic variables. It comes from Census data from 1970-2000 and the 2006-2010 American Community Survey. In their analysis, they find that rail access increases family's median income on average. They also observed that the treatment effect is strongly correlated with initial income. This means that initially richer neighborhoods benefit disproportionately more than poor ones from transit access. They additionally found that transit did lead to increased neighborhood segregation.

Literature finds that transit investment causes gentrification and others find that it is a poverty magnet. This finds that both are occurring, and it depends on the initial structure of neighborhoods. In this specific case, it varies with race and income. They found that the light rail did not change economic activity suggesting that the increase in income from the light rail may have to do with factors such as being able to move to lower-cost housing areas due to public transit access.

Rowangould, G. M. (2013). A census of the US near-roadway population: Public health and environmental justice considerations. *Transportation Research Part D: Transport and Environment*, 25, 59–67.
<https://doi.org/10.1016/j.trd.2013.08.003>

A major concern with transportation investment is the environmental impacts it has on those who live near the investments. This first paper explores who lives near busy roads.

This paper is meant to accompany other literature investigating near roadway health concerns. The author's contribution to this discussion is a further look into the population that lives near roadways, as well as examining air quality monitors in those areas. To assess this, they use data for traffic volume, from the highway performance monitoring system. A part of this data includes the US highway network and other primary roads. Race and income were measured by Census data using counts of populations for different block groups. Racial and income populations within block groups are measured as differences from the county average to measure disparities. Using GIS, they can identify areas closest to highways, near the highest amount of traffic, and the traffic density of each block group. EPA's air quality monitor's locations are also included in the analysis.

They find that for the US population, 19.3% live near roadways that have a high volume of traffic. These populations have higher risk of exposure to emissions. Comparatively, the percentage of non-White people that live near high volume roadways is 27.4%, which is significantly higher than the US population average. They also find that the income level of those living near roadways with a high volume of traffic have an average income of a little over \$1000 less than the national average. Even within the population that lives near roadways, there is discrepancy in race and income depending on traffic volume. They find areas with the highest traffic volume have higher levels of income and race disparities. They find comparable results for traffic density.

All this data is national average, though, and individual counties, block groups, and states have differing percentages, the extremes being Washington D.C. with 62% of their population living near high volume roads and Falls Church County Virginia with 79% of their population living near high volume roads. The air monitors were not placed in areas of high traffic volume, so the data for air quality was inconclusive.

Where these results conflict with previous literature, is that previous literature suggested that populations near roadways were primarily in large urban areas, but these results show that having a substantial percentage of populations near high volume and traffic dense roadways is not exclusive to urban areas and that this occurs in almost every county. The population living near these high volume and traffic dense roadways are also more likely to be a minority or lower income, on average. Since this is a national average, though, not every county or state follow this, with areas like California having more pronounced disparities, and other counties having the opposite effect.

Knowing that low-income populations withstand the worst of the environmental impacts from transportation, this paper looks at strategies to begin correcting for this.

Federal Highway Administration. (2016). *Climate Change and Environmental Justice: Considerations for Transportation Decision-making*. National Transportation Library: United States Department of Transportation. Retrieved from <https://rosap.ntl.bts.gov/view/dot/51735>

In this paper, they provide context as to why low-income communities experience larger environmental impacts and strategize how to deal with these issues. They explain how the areas with cheaper housing, tend to be the places that are more hazardous. One example of how transportation aids in this, is diverting floodwaters. In trying to do this, often the water may get diverted to places with lower property values. Since lower income individuals also have more barriers to participate politically, like not having time to be at public meetings, their needs are not met.

To start working on these problems, they suggest a few possible strategies. These suggestions consist of green infrastructure for recreation purposes and as a way to help with flooding, reducing greenhouse gases through more public transportation investment and planning, and policy strategies like taxing emissions. With policy strategies like taxing emissions, they also explain how these policies can disproportionately affect low-income groups through high energy bills. To account for this, they specifically recommend using the tax money to invest in improving energy efficiency, like renewable energy sources.

Lastly, they provide resources for determining what the communities being impacted by these environmental concerns need. To address these needs, state, local and MPO's all contribute to solving climate issues and can work together. They start by explaining how the planning process needs to involve the community, specifically those who are directly impacted. For planning processes, the Federal Highway Administration has a framework called the Climate Change Adaptation Framework and a Guide to Assessing Criticality in Transportation Adaptation Planning, that would be useful as identification and assessment tools. Another useful resource is a report from the Union of Concerned Scientists (UCS). It is useful since it is a climate risk indicator, so they are able to find where areas on the coast are the most at risk of flooding. Other resources to identify areas of higher risk for environmental concerns are the Socioeconomic Vulnerability Index and the USDOT Gulf Coast criticality assessment. An additional suggestion was the need to include everyone in emergency and evacuation procedures, so this means things such as incorporating alternative modes of transportation for those who do not own a car or have disabilities and having translations of emergency directions.

Equitable Planning and Policies for Transportation Investments

Clifton, K., Morrissey, S., Bronstein, S. (2014). The Path to Complete Streets in Underserved Communities: Lessons from U.S. Case Studies. Portland, OR: Portland State University.

In making transportation investment decisions, it is important to incorporate equity into planning and policies. This article discusses a policy named “Complete Streets” that aims at increasing access for everyone.

This article discusses case studies of communities that have implemented “complete streets” strategies for their transportation systems. “Complete streets” is a term that describes a transportation plan involving multimodal transportation and increasing safe access to destinations. It is based on equity and helping disadvantaged populations. They highlight four communities, Sault Ste. Marie, Michigan, Decatur, Georgia, Nashville, Tennessee, and Portland, Oregon, to demonstrate how to implement complete streets policy.

Sault Ste. Marie Tribe of Chippewa Indians Michigan

Using the CHANGE tool, this community found that there was a need for more active transportation. As a result of the studies done in the area, they have since upgraded crosswalks, installed way-finding signs, painted more bike lanes, built sidewalks, and are planning to put up bikeway signs. Another product of the push for increased walkability, is that transportation planners have mandated to put in sidewalks when a road is being repaved.

Decatur, Georgia

Although Decatur has a median income of \$82,406 and is highly educated, about 18% of those who live there, live below the poverty line. As part of their community transportation plan, they held meetings to get the perspective of low-income residents. They identified needs such as increasing access to transit, improving crosswalks, and a continuation of the previous work started by the Safe Routes to School program. Since then, there has been more emphasis on transportation that promotes physical activity, improving transportation facilities and access to them for the transport disadvantaged. They have been granted permission to build a crosswalk, are reallocating road capacity on specific city streets, putting in more bike safety precautions, and improving sidewalks. Every new project gets discussed in a publicly held meeting.

Nashville, Tennessee

Up until recently, Nashville did not have an extensive transit service. They were also ranked first in the nation in 2010 for how much time commuters spent in their vehicle. The push for active transportation came from a growing number of overweight and obese adults, that were disproportionately rural, African American, and Hispanic. Their aim was to have at least two modes of transportation accessible for every person to get to food, work, school, and recreation. They had already been implementing more bike sharing programs, so the complete streets policy framework had a foundation to build from. Since the rise in obesity was primarily affecting lower income and minority communities, the emphasis was placed on reaching those areas. After the implementation, the city has seen increasing support for active transportation. In a survey they collected from 2009 to 2011, bicycle count increased by 50%. There was also a 300% increase in foot traffic in a few of the locations that received the new pedestrian focused developments.

Portland, Oregon

While Portland is known for being one of the first to heavily invest in active transportation, there are inequities within who receives the benefits of their transportation systems. The central city has great transportation, but East Portland is automobile dependent. East Portland is one of the most racially and ethnically diverse areas in Oregon. There is also a higher percentage of low-income people there, with a median income that is 23% less than the other surrounding areas in Portland. To compensate for this lack of transportation, they created a bicycle plan. East Portland ranked high in need but already had the most amount of bike lanes for all of Portland, but they were disconnected and on busy roads, therefore underserving those they were aimed for. The most helpful outcome from their plan was a new, equity-oriented project prioritization criterion that let them better allocate resources to those who needed them. Since then, they have already seen more active transportation projects developing in East Portland.

The overall lessons from this paper are that public support is key in implementing these projects for active transportation, input from disadvantaged communities helps drive productive investments and that equitable transportation is correlated with public health.

Following the concepts of the Complete Streets policy framework, this paper discusses the importance of incorporating multiple forms of transportation to create more equitable systems.

Litman, T. (2021, April 22). Evaluating Transportation Diversity. Victoria Transport Policy Institute; Victoria Transport Policy Institute.
<https://vtpi.org/choice.pdf>

This report stresses the importance of transportation diversity and providing multiple options for transportation, especially since there has been a decline in other forms of transportation in recent years, focusing on car-based forms of travel. Lack of mobility can impact people socially and economically. Depending on automobiles and focusing investment on automobiles, means lower income individuals may have to spend more on transportation and makes problems such as traffic, congestion, and pollution worse. Current transportation planning tends to focus on travel speed, which means more investment in road condition and widening, rather than investment in bike lanes or other forms of non-car-based travel. Current spending on different transportation investments demonstrates this automobile dependence. Roughly \$700 per capita is spent on roads and even more is spent on parking subsidies (in the \$1000-3000 range). Only \$100-200 per capita is spent on transit subsidies and \$20-50 per capita is spent on pedestrian and cycling facilities. Typically, within a community, around 20-40% cannot, should not, or prefer not to drive, and about 15-30% of that group is low-income households who cannot afford it.

They make a case for multimodal planning due to these issues with current planning and the following benefits. Some benefits of diversity in transportation include reducing traffic congestion, affordable transportation that helps low-income individuals, and increased mobility for non-drivers. Without mobility, people are unable to access basic needs and activities, causing negative impacts on physical and mental health. By increasing mobility, they can access school and jobs. If low-income kids have economic access, they will do better as adults. Other benefits like decreasing traffic injuries and death, increasing health outcomes, reducing pollution emissions, reducing land consumption, and increasing local economic development, show the broad range of positive outcomes of diverse transit.

In measuring transportation diversity, each category has their own set of indicators and determinants. These categories are walkability (things such as portion of roads with sidewalks), universal design (accommodating diverse needs based on ability), bicycling (amount of bike lanes), public transit (local index of transit availability), taxi services, automobile travel, telework and access, and delivery services. For overall measurement, the Transportation for Everyone rating system is used.

Following this there is a discussion about different methods for planning in policy that focus on multimodal transit so that these issues are accounted for. Equitable investment has two categories. Horizontal equity means equal share, so if 30% are non-drivers, 30% of investment should go to non-automobile forms of transit. The other is vertical equity which involves policy making and using policies to favor disadvantaged groups. A solution they mention as an example of this is paying for parking. Automobile services are used more because of costs. When parking is free, people drive more. Having to pay for parking reduces congestion, traffic, and accidents.

Van Dort, L., Guthrie, A., Fan, Y., & Baas, G. (2019). (rep.). *Advancing Transportation Equity: Research and Practice*(pp. 1–81). St. Paul, MN: Minnesota Department of Transportation.

Similar to this equity project, Minnesota’s Department of Transportation conducted an equity-based project in 2017. Their scope does focus more on policy and general understanding of transportation equity, but they do discuss topics that start to answer this research question as well. Some of the sources they cited also were applicable to this research question and used in this review.

This research is a literature review that was done to find out how underserved communities are affected by transportation systems, services, and decisions. They use the definitions they found of transportation equity in their literature review to evaluate twenty-four different organizations that promote transportation equity. One of the programs they discuss, that is relevant to Washington, is Seattle’s Department of Transportation’s Transportation Equity Program. They find that Seattle’s program takes a different approach than the other programs being evaluated, by giving direct support to disadvantaged community members. They do this by offering reduced fare transit passes, free transit passes for kids who attend public high school or middle school, rebates on automobile registration, discounting car sharing, and including marginalized communities in the discussion for improvements. They use Seattle as a positive case study that should be implemented at a state level because they offer diverse solutions that increase mobility, specifically for typically underserved populations.

The next part of their research involved interviewing stakeholders and community members. From these interviews they found that stakeholders wanted to focus on multimodal transportation and public transit in the future. For barriers to transportation equity, they identified topics such as lack of funding and understanding, perceptions of safety, and inadequate leadership. From the community members responses, the majority indicated increased infrastructure for walking and rolling as the biggest need. They also responded that cars were the easiest for traveling to destinations, highlighting transportation system’s dependence on cars. From the interviews, the definition they produced for transportation equity involves quality, affordable, sustainable, and efficient multimodal transportation that is accessible for everyone and that involves communicating with the public to serve underserved groups.

Lastly, they propose recommendations for transportation equity from their findings. Some of the categories for improvements include community leadership specifically focusing on amplifying voices from underserved communities, increasing economic and social opportunities through policies and program partnership, emphasizing active transportation, equity-based allocation of resources, working with other organizations, and measuring impacts of transportation systems both quantitatively and qualitatively. Each one of these categories having multiple, more specific recommendations, as well.

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