

# EV and E-Bike Barriers and Equity in Eugene

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## Background

The City of Eugene has set a goal to “reduce community fossil fuel use by 50% of 2010 levels by 2030” in their Climate Recovery Ordinance of 2014 (City of Eugene, n.d.). One way the city aims to reach these targets is by promoting the use of electric vehicles (EVs) and electric bicycles (e-bikes), which use electric power rather than gasoline or diesel fuel. The City wants to gather information about barriers to EV adoption, particularly for marginalized demographic groups in Eugene, to prepare for future projects centered around making these electric options more accessible and attractive for residents.

According to the Oregon Department of Energy’s (ODOE) 2021 Biennial Zero Emission Vehicle Report, Oregon failed to meet its 2020 goal of at least 50,000 registered Zero Emission Vehicles (ZEVs), and this trend may continue for its 2025, 2030 and 2035 goals. As of this year, approximately 1% of cars in Oregon are ZEVs (ODOE 2021). The City of Eugene has similar goals of having 50% of all registered vehicles be electric by 2030 and 90% by 2050 (City of Eugene, 2019). So far, Eugene is also failing to meet these goals; in 2020 the City reached only 11.6% of its 2030 goal of having 15,000 EVs (City of Eugene, 2021).

There are many potential obstacles that could prevent a resident from using an EV or e-bike. While EVs have a lower overall cost of ownership due to decreased maintenance needs and cheaper fuel, the higher upfront cost of these vehicles continues to be an obstacle, especially for low-income households and people of color. Additionally, many areas, especially multifamily housing and rural areas, lack charging infrastructure (ODOE 2021).

Achieving equitable EV adoption for the city of Eugene and the state of Oregon is imperative because marginalized communities are the most vulnerable to environmental hazards (ODOE 2021), which refers to “extreme events or substances in the Earth and its ecological system that may cause adverse consequences for humans and things they value” (Liverman, 2002).

## Project Purpose

This project aims to reveal the key barriers that prevent Eugene residents from using EVs and e-bikes and how those barriers are experienced by different population groups, such as low-income people, people of color, renters, seniors and young adults.

We set out to answer three research questions:

1. What financial, logistical, educational, and/or social barriers stop residents in Eugene from switching to electric vehicles (EVs) and electric bicycles?
2. Are there notable differences in which barriers feel significant to different population groups, such as: low-income residents, residents of color, renters, older adults, and young adults?
3. Based on the results of the first two research questions, do we have recommendations for the City of Eugene on how to make our EV messaging, programming, and/or charging station system better fit the concerns of currently under-served populations groups?

The data and research in this report can be used to inform the City of Eugene's policy choices regarding EV and e-bike adoption in the future to further environmental justice. The Environmental Protection Agency (EPA) defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" (U.S. EPA, 2021).

## Methodology

Our research process contained three components: case studies, a survey and a focus group.

### Case studies

We analyzed four case studies to get a better understanding of the policy environment surrounding EVs and e-bikes and what has been effective or ineffective in other cities. The EV/e-bike case studies focus on barriers and equity, implementation and efficacy of local policies, infrastructure impediments, and incentives for businesses in public-private partnerships.

### Survey

Our team conducted a Qualtrics survey. We distributed the survey digitally through environmental and transportation-based community organizations who agreed to share the survey with their audience, and social media, including Nextdoor and local Facebook groups. We also distributed it through physical flyers with QR codes and URLs that were concentrated in parts of Eugene with key demographics (Figure 1). The survey was open for two weeks, and we received 217 responses. Of those 217 responses, we analyzed the 192 that were complete.

The survey had key four key sections:

- Demographic questions which collected information on characteristics like income level, race, age, gender and housing status.
- Questions that asked participants to rank to what extent certain factors, such as cost, access to charging stations and access to information, were considerations that would/did impact their decision to use an EV or e-bike. The options for these multiple choice questions were: high consideration, moderate consideration, slight consideration, not a consideration, and unsure.
- Questions asking participants to rank to what extent certain resources, such as rebates or greater access to charging stations, would encourage them to use an EV or e-bike.
- Open-ended questions that prompted participants to share other thoughts on factors they would/did consider when deciding whether to use an EV or e-bike.

## Focus group

We held an hour-long virtual focus group on Nov. 20 with six participants who were recruited through the survey. Out of the 86 survey participants who expressed interest in a focus group, we reached out to about 30 people who were part of key demographics like low income groups, renter-status, racial minorities, and different age groups. We offered the incentive of gift cards provided by the City. While 10 people registered (due to cost limitations, we could only offer 10 gift cards), only six attended the group. Of those who attended, three were seniors, four were low-income, three were seniors (65+), one was a young adult (under 30), and one was a person of color.

The table below shows the demographic breakdown of the focus group participants.

Demographic Breakdown of Focus Group Participants	
Renter	3
Low-Income	4
Senior	3
Young Adult	1
Person of Color	1
Does Not Own/Use an EV or E-Bike	5
Owens/Uses an E-Bike	1

During the focus group, we asked seven questions, based partially on the survey responses:

1. What are your thoughts on safety for e-bikes? What sort of bike infrastructure would allow you to feel safe using one?
2. Are concerns about theft preventing you from using an e-bike? What sort of resources would help you feel more secure and less vulnerable to theft?
3. What kind of activities could you see yourself using an e-bike for?
4. How accessible do EV charging stations seem where you live and work? How concerned are you about charging for EVs?
5. What are your concerns about EV batteries? Are there any resources or types of information you would like to see to address those concerns?
6. What do you know about EV rebates and credits, and are there any other financial interventions or supports that would help you get an EV?
7. If you wanted to use an EV or an e-bike, would your top choice be buying, leasing or using a rideshare program, and why?

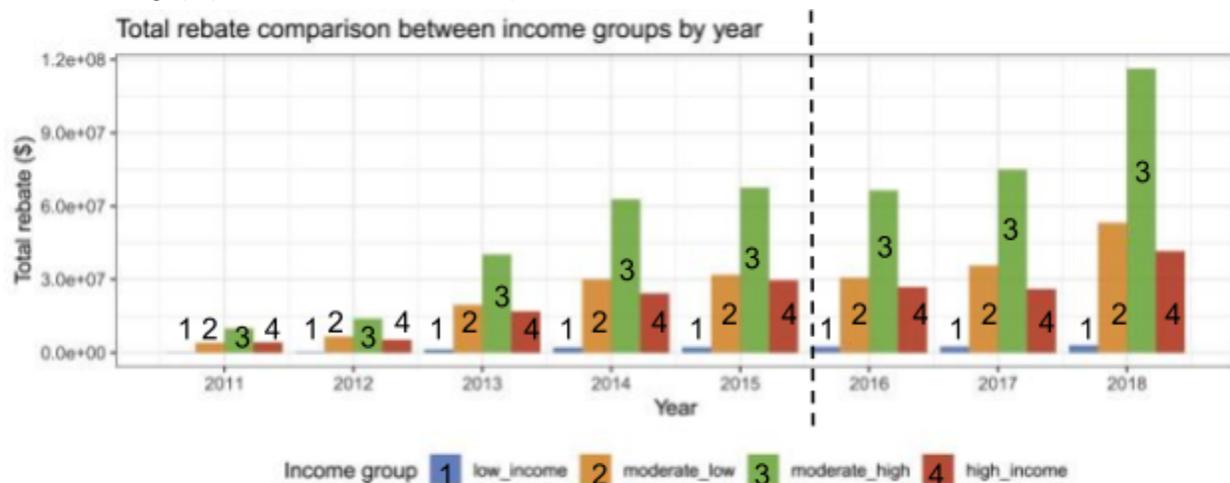
See the appendix for a coded transcript of our focus group.

## Findings: Case Studies

### “Disparities and Equity Issues in Electric Vehicle Rebate Allocation”

Source: Energy Policy 154 (2021): 1-14

This paper looks at distributional effects of EV rebates, based on the Clean Vehicle Rebate Program (CVRP) in California from 2010-2018. The authors analyze the fairness of rebate allocation in the state, finding that rebates are predominately given to high-income buyers and are rarely given to residents in disadvantaged communities. In response to this finding, the CVRP implemented an income-cap policy for the rebates in 2016, which has narrowed the distribution gap between the highest and lower-income households over time. The “Total rebate comparison between income groups by year” graph below illustrates the narrowing of this distribution gap (Guo and Kontou, 2021).



Rebate usage for plug-in EVs over the years. Note: The income cap was put in place in 2016 (Figure 8 in Guo and Kontou, 2021).

Rebate allocation is concentrated in major metropolitan regions. The authors reveal neighborhood effects in EV adoption, finding that low-income households and residents of disadvantaged communities are more likely to utilize EV rebates if the residents in their adjacent neighborhood(s)/census tract(s) do. The authors find that this may suggest that people are more likely to purchase EVs if their neighbors do (Guo and Kontou, 2021).

### “Charged for Growth: Electric Mobility Planning in San Jose, CA, 2020”

Source: Shared-Use Mobility Center.

San Jose has some of the highest EV adoption rates in the country. In 2018, the city replaced its previous climate plan with Climate Smart San Jose, the city’s Paris Accord-aligned action plan which includes a goal of 63,099 electric vehicles registered in the City by 2025. The plan centered nine strategies; one of them is personalized mobility choices, or how individuals chose to get around the city on a day to day basis. Within this longer-term plan, the city also developed

its “San Jose Electric Mobility Roadmap: 2020-2022,” a shorter term strategic plan designed to help the City move toward its Climate Smart San Jose goals.

Climate Smart San Jose has two key approaches: behavior (reducing the need to drive alone through expanded mobility options, including improved bike, pedestrian and public transit facilities) and technology (accelerating the adoption of electric vehicles). To assist with EV adoption, the city assessed and improved the distributions of EV charging stations throughout the city. As of January 2020, it has over 50 public charging stations, mostly located in or near public parking garages in downtown areas. The city uses its Electric Vehicle Reach Code to determine where new charging stations are needed and is considering incorporating EV charging station requirements for property owners making major renovations to buildings used by the public.

The City incentivizes individuals to use EVs through its Clean Air Vehicles program which allows EV owners to park for free with all City on-street parking meters and allows vehicles with Clean Air Vehicle decals (which you can obtain as an EV driver) to use the carpool lanes.

In addition to individual incentives and charging accessibility, the City’s Roadmap suggests replacing all non-police city sedans that are older than ten years with electric vehicles. These vehicles travel more miles per year than typical passenger vehicles and so would significantly affect total emissions, and this effort could demonstrate the City’s leadership and dedication to EVs, hopefully encouraging others to follow. The Roadmap also suggests developing a group buy or lease program for EVs to help residents address cost, which is one of the biggest barriers to EV ownership. One way to do this, according to the Roadmap, is to encourage the local carshare company Zipcar to incorporate EVs into its fleet.

#### [“Removing Barriers to Electric Vehicle Adoption by Increasing Access to Charging Infrastructure”](#)

*Source:* Seattle Office of Sustainability & Environment

In 2014, the Seattle Office of Sustainability and Environment studied the barriers to EV adoption in the Seattle Metropolitan area. At this time Seattle had one of the highest rates of electric vehicle adoption in the country. The main focus of this case study is “equitable access,” which is defined as the “choice to purchase an electric vehicle unfettered by one’s home location and ability to reliably park and charge the electric vehicle off-street.”

This study found that the two primary barriers to electric vehicle adoption for a potential user are: information barriers and access barriers. Access barriers were more emphasized throughout this document, and are more applicable for our research. The main access barrier recognized in this study was “garage orphans,” or electric vehicles that did not have access to their own off-street parking. There are homes spread out throughout the Seattle Metropolitan area that do not have a garage, or some other sort of off street private parking, for their own personal EV charger. The “garage orphans” are a problem for electric vehicle adoption because,

overall, the majority of EV charging occurs at home, and will continue to, as more EV adoption occurs.

After the study, the Seattle Office of Sustainability and Environment had some key findings that decrease the effects of access barriers. One way to help alleviate the burden of “garage orphans,” is to offer after-hours access to private lots and institutional lots. Another way to decrease the impact of “garage orphans,” is to change building codes for multi-family housing, and other types of units, to include the provision of EV chargers on location. The biggest motivators for “garage orphans” to use public charging stations are: location, cost, and availability or convenience. Finally, the study found that an individual's perceived barriers are not fixed and may be influenced by multiple variables.

**“Impact of the Cycle to Work Scheme: Evidence Report”**

*Source:* Institute for Employment Studies

According to the Center for Strategic and International Studies, commuting to and from work accounts for about a quarter of total vehicle trips and 30% of total vehicle miles traveled in the U.S (Tsafos). Despite the obvious overlap between work and travel, most policies aimed at altering U.S. travel behavior targets individual drivers and commuters. Treating people simply as individuals ignores the ways in which U.S. commuters are embedded within a set of institutions like private companies and municipalities. Municipalities often find themselves unable to effectively communicate with their constituents, yet a central function of successful businesses is to communicate with its employees. The City of Eugene, thus, should utilize its connection to businesses to encourage EV and e-bike adoption (expanded recommendation in “Recommendations” section).

The United Kingdom, for example, has implemented an expansive cycle to work program in order to encourage more workers to commute via bike. According to the Institute for Employment Studies (IES), 180,000 workers take advantage of the cycle to work program each year (Swift et al.). This program has created a Cycle to Work Alliance which includes Cyclescheme, Cycle Solutions, and Evans Cycles and Halfords to partner with employers to administer the program’s benefits to employees, who can save 15-39% on a new bike and bike accessories (Swift et al.).

The IES has come away with several important findings. Although there was not a significant overall increase in cycling, the study did find meaningful increases in the percentage of those cycling in metropolitan areas and a significant increase for those who were not frequent cyclers before joining the program. Further, the study “estimates that the social benefit from reduced absence and increased physical fitness to be £72 million a year. This amounts to more than twice the estimated cost to the Treasury in lost tax and National Insurance. In addition there are likely to be further environmental benefits” (Swift et al.).

Similar to the U.K., Eugene is quite bike friendly, certified as a Gold level bike-friendly city and ranked number three nationally as one of the best places for a biker as of 2019 (*Bike | Eugene,*

OR Website). Further, the city already boasts an impressive array of resources that make Eugene especially amenable to bikers like its public infrastructure, pro-cycling nonprofits, the University of Oregon, an extensive rideshare program around the downtown and university areas, and green companies that have promoted cycling in the city. Eugene shares similarities to the U.K. that should inform the ways in which it can leverage its relationship to nonprofits and private business to increase commuting via electric bikes.

**[“Mountain Rose Herbs Alternative Commute Program”](#)**

*Source:* Mountain Rose Herbs Sustainability Report

Mountain Rose Herbs is one of the largest herb and spice sellers in the United States but is also deeply committed to ethical business practices and sustainability. One of their successful programs is the alternative commute program. This is where Mountain Rose Herbs will pay its employees “substantial cash incentives to all employees who carpool with fellow employees, ride the bus, bicycle, or walk to work.” Those who carpool or ride the bus receive \$0.15 per mile and those who bike or walk receive \$0.25 per mile. They also offer four \$250 cash prizes to the employee who logs the most miles via each mode of transportation. In order to boost the efficacy of the program, Mountain Rose Herbs gives its employees “access to a covered and locked bike garage, carpool buddy sign-up, indoor lockers, showers, and a bicycle repair kit. According to their most recent sustainability report in 2018, Mountain Rose Herbs paid \$13,500 to its employees.

Mountain Rose Herbs did not track the climate impact for all of 2018, but during its participation in a local Business Commute Challenge, “58 employees carpooled, walked, bussed, or cycled to work, logging 211 roundtrips during a rainy week in May.” This week’s data may not be representative of the entire year. However, Mountain Rose Herbs paid cash payouts to employees for traveling between 50,000 and 83,000 miles via modes of transportation that were more sustainable than single-person vehicles, thereby, having a significant effect on reducing greenhouse gas emissions from traveling to work.

## Findings: Survey

The table below shows the demographic breakdown of the survey respondents.

Demographic Breakdown of Survey Respondent	
Renter	44
Low-Income	43
Senior	85
Young Adult	21

Person of Color	35
Does Not Own/Use an EV or E-Bike	129
Owens/Uses an E-Bike	35

Of the 192 complete survey responses, 65% of participants did not own or rent an EV or e-bike. Because our data on residents who do own or rent an EV or e-bike is limited, this analysis focuses primarily on responses from residents without EVs or e-bikes. On the multiple choice questions, participants were asked to what extent a certain factor was or was not a consideration for them in deciding to use an EV or e-bike and given five options: Not a consideration, slight consideration, moderate consideration, high consideration or unsure.

## E-Bikes

For participants who do not own or rent an electric bike, the highest ranked e-bike considerations were:

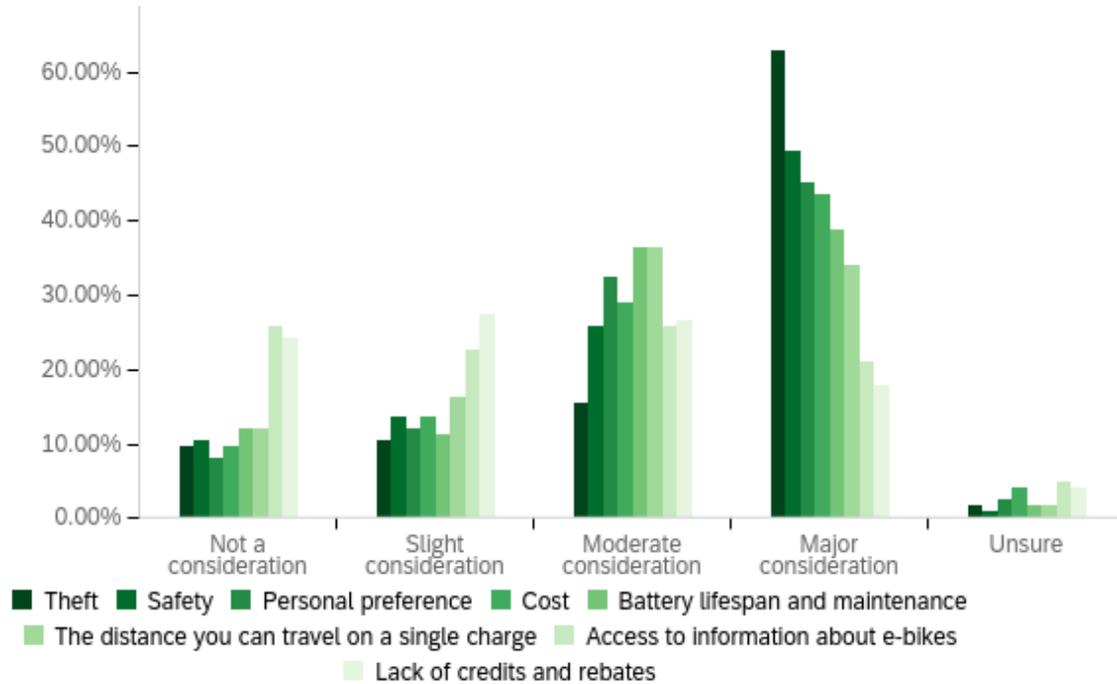
- Theft, with 63% of respondents ranking it as a high consideration and 15% ranking it as a moderate consideration.
- Safety, with 49% of respondents ranking cost as a high consideration and 26% ranking it as a moderate concern.

Respondents were also fairly concerned about:

- Personal preference, with 45% of respondents ranking it a high consideration and 32% ranking it as a moderate consideration.
- Cost, with 43% of respondents ranking it as a high consideration and 29% ranking it as a moderate consideration.
- Battery lifespan and maintenance, with 39% of respondents ranking it as a high consideration and 36% ranking it as a moderate consideration.

Participants who do own or an e-bike rent also ranked theft, safety and personal preference as the top considerations.

The distance you can travel on a single charge, access to information and tax credits and rebates were ranked the lowest.



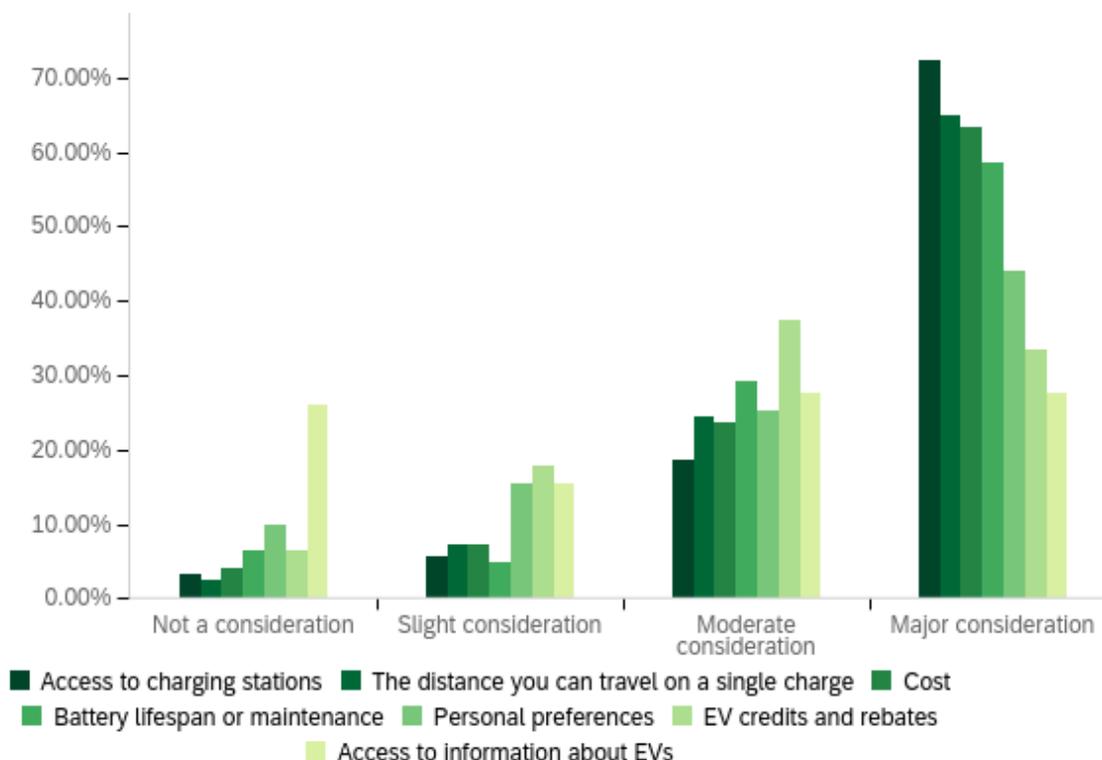
*Survey question: To what extent would each of the following be a consideration for you in purchasing or renting an electric bike?*

## EVs

For participants who do not own or rent an EV, the highest ranked EV considerations were:

- Access to charging stations, with 72% of respondents ranking it as a high consideration and 19% ranking it as a moderate consideration.
- The distance you can travel on a single charge, with 65% of respondents ranking it as a high consideration and 24% ranking it as a moderate consideration.
- Cost, with 64% of respondents ranking it as a high consideration and 24% ranking it as a moderate consideration.
- Battery lifespan or maintenance, with 59% of respondents ranking it as a high consideration and 29% ranking it as a moderate consideration.

EV credits and rebates, personal preference and access to information about EVs were all ranked as lower considerations.



*Survey question: To what extent would each of the following be a consideration for you in purchasing or leasing an electric vehicle?*

## Demographic differences

The demographic section of the survey allowed us to observe differences between people of different backgrounds and characteristics. There were a lot of similarities between racial groups in many of the categories. However, there was a noticeable difference in how people of color and white people viewed battery lifespan and maintenance. People of color considered battery maintenance and lifespan a major consideration; whereas, white respondents were less concerned (Appendix D).

Overall, participants ranked considerations like access to charging stations, rebates/financial incentives, and resources for EV/e-bike maintenance the highest, placing them above education or access to information. While these trends remained largely steady across income groups, those who earned less reported, on average, that education about electric vehicles and e-bikes was a more significant factor in encouraging them to transition (Appendix E).

There is still more analysis that needs to be conducted on the survey; however, our preliminary analysis is indicating, broadly, minor differences in perceived considerations between demographic groups.

It is important to note that our survey respondents were not as racially diverse as we would have liked. Therefore, we likely do not have a large enough sample size to make definitive conclusions. With regards to household income, we did receive many respondents from all income levels and feel much more confident in the extrapolation of the survey. However, it is important to note that this survey, though intended to be useful in the future, should not be the only survey the City conducts. Its successes and drawbacks should inform the city as it conducts larger assessments of public perception regarding electric vehicles and bikes.

Access to charging stations for EVs was a high consideration over all, with more than 95% of respondents indicating that their access was at least a slight consideration (Appendix F). However, only white respondents answered that it would not be a consideration, while community members of color answered that it was a major consideration 70-100% of the time, (Appendix F). This shows that community members of color, a key demographic, consider access to charging stations a very important consideration in potential decisions to purchase or lease an EV.

## Findings: Focus Group

The table below shows the demographic breakdown of the focus group participants.

Demographic Breakdown of Focus Group Participants	
Renter	3
Low-Income	4
Senior	3
Young Adult	1
Person of Color	1
Does Not Own/Use an EV or E-Bike	5
Owens/Uses an E-Bike	1

We used the focus group to gain more insight into considerations that were highlighted by the survey. Here are the themes that stood out to us after reviewing and coding our focus group transcript.

E-bikes: theft

Theft was one of the most prominent themes from the focus group; it was brought up by multiple participants before we asked our theft question. One person said, "That's an expensive bike, and they get stolen all the time, everywhere you go. What kind of expensive lock is going to be needed?" Another said "I don't ride my bike anywhere where I have to lock it outside, including the grocery store, and that prevents me from using it to get groceries and things like that."

Participants wanted more secure bike parking options, with multiple people describing enclosed bike parking spaces in central locations. They also posed concerns about whether e-bikes have expensive parts that could be removed by thieves.

### E-bikes: safety

Focus group participants were unsure if people ride e-bikes on roads or sidewalks and were concerned that unexpected acceleration (as many people are not used to e-bikes) could cause collisions with cars or pedestrians.

One participant was worried about whether they'd be able to transport an e-bike on a public bus and what would happen if their bike battery died and they were stranded somewhere. Another participant wanted protected bike lanes to benefit both manual and e-bike riders.

### E-bikes: uses

Some people said they could imagine replacing car trips for shopping or recreation with an e-bike. Participants discussed the ways that e-bikes can make it easier to bike on hills, haul children or cargo around, and ride if you are injured, disabled or a senior.

### EVs: charging stations

Overall, participants didn't seem well informed about where charging stations are located in Eugene or how many are available. This uncertainty was a significant concern to several participants, especially when it came to traveling to outdoor recreation areas or leaving Eugene. One person said, "I don't know how accessible they are.. And that's one of my main concerns as far as using an electric car to travel out of town."

Participants also asked questions about how/if it's possible to charge EVs at home and the cost of charging, indicating a need for more education. One participant also brought up barriers for renters, noting that "you're not necessarily guaranteed parking where you rent and so the city is probably going to have to expand what they offer for charging."

### EVs: batteries

Lack of knowledge and familiarity around EV batteries seemed to be a major consideration. Two participants discussed wanting a standardized informational resource that would let buyers

evaluate and select EV batteries. One participant described feeling overwhelmed with “just a whole lot of vague and swirling and changing information about the batteries.”

This was the only area in which participants specifically asked for more education and information. Two also mentioned that having educational events in which people could try driving an EV (or riding an e-bike) as well as learning about them would be helpful.

## EVs: credits, rebates and costs

Participants generally expressed that tax incentives make “a huge difference.” However, some participants noted that, due to their earnings, they didn’t qualify for tax rebates and needed other types of financial support.

They also discussed the higher insurance costs for EVs and that it’s difficult to buy a used EV, which may be appealing for many low-income people, because not many are available and EVs tend to maintain their value over time. Finally, one participant expressed concern about needing to bring EVs to dealerships for maintenance as mechanics offering more affordable service may not be knowledgeable about EVs.

## Recommendations

### Public Education and Targeted Information Campaign

While survey participants ranked access to information as a relatively low consideration on the survey, our focus group revealed that people have many concerns and questions about EVs and e-bikes that can be largely addressed through education. We believe that the City can increase EV and e-bike adoption by expanding its outreach and education through the following strategies.

We suggest the city hold in-person educational events with a few key components. Firstly, in-person elements with opportunities for residents to try driving an EV and/or riding an e-bike in addition would be beneficial. One survey respondent noted that they couldn’t find somewhere to do an EV test drive closer than Portland. These tangible experiences can help people imagine themselves owning an EV or e-bike. Secondly, we suggest incorporating printed materials and/or online resources that community members can reference on their own time, as multiple focus group participants described a need for this. Finally, we suggest informational presentations and discussions focused on the topics listed below.

Based on our survey and focus group findings, we suggest prioritizing information on these topics for EVs:

- Maps identifying the locations and costs of charging stations in Eugene and throughout Oregon (as focus group participants were especially concerned about traveling outside of Eugene)

- Education about public and at-home charging options and their costs
- Guides to selecting an EV with a high-quality battery and battery maintenance

We suggest prioritizing information on these topics for e-bikes:

- Effective strategies for preventing bike theft
- Where residents are allowed to ride e-bikes and how they can operate safely alongside cars and manual bikes
- Highlighting the advantages of e-bikes that our participants expressed interest in: being able to ride in hilly parts of town, easier riding for those with injuries or disabilities, traveling further distances and pulling children or cargo more easily.

Finally, we suggest increasing the visibility and educational value of current EV charging stations in Eugene. This could be done through attention-grabbing signs that direct people to the charging station and give them basic information about EV usage in Eugene. When determining locations for additional charging locations, we also suggest prioritizing easily visible locations to help normalize and inform people about EVs. This suggestion is based on the fact that many of our focus group participants, even those interested in EVs, did not know where charging stations were located.

In order to deliver information to marginalized groups who may have a harder time accessing EVs and e-bikes, we also recommend a targeted information campaign. We've identified key census tracts with high concentrations of the demographic groups identified in our research question. Using the heat maps in Appendix A, an overlap map was created that shows the areas in the City of Eugene where there is overlap between the key demographic groups identified by the research question (Figure 1). This was used to identify Eugene neighborhoods, (Figure 2), that had the most overlap of key demographics. The key neighborhoods identified were: Bethel, Harlow, Whiteaker, Churchill, Friendly, Amazon, Southwest Hills, Southeast, Downtown, Santa Clara, Industrial Corridor, Goodpasture Island, and Northeast neighborhoods. For more information on the Eugene neighborhoods, and the key demographics in them, reference Appendix G. The neighborhoods directly surrounding the University of Oregon could also be targeted as they had a high concentration of key demographics, however, many of the households in the area are made up of college students, which was not identified as a key demographic for our research.

The priority target information campaign could be achieved through mail or well-advertised (and potentially incentivized) community events. If this suggestion were implemented through the mail, it would require creating graphics for postcards and coordinating with the USPS. If it were implemented as community events, it would require investments like communication networks, meeting facilitation, agenda planning, etc.

Dispersing information about available financial incentives and Frequently Asked Questions (FAQs) about EVs and E-Bikes to historically underrepresented groups would show an authentic commitment to environmental justice by the City. This could be carried out by the Eugene Transportation Planning Department, the Emerald Valley Electric Vehicle Association, a

partnership between the two, or potentially in partnership with various local identity-based nonprofits.

Lack of information appears to be a widespread obstacle to EV and E-Bike use, especially among the marginalized groups that this study focused on. Therefore, making an intentional effort to reach those that are historically underrepresented and less likely to be engaged could have a significant impact in reducing equity-related barriers.

## Infrastructure Recommendations for E-Bikes

Regarding e-bikes, we suggest expanding infrastructure that will make both manual and electric bikes more accessible options. Our focus group participants and survey respondents (in the open ended section) discussed needing more bike lanes that they feel safe riding on. We suggest the City continue developing more protected bike lanes through Eugene that connect community, business and residential areas. If people who aren't typically bikers are to start using e-bikes to replace car trips (which some of our focus group participants described as an option), we will need safer bike lane options that the average person will feel comfortable using.

One of the biggest concerns related to e-bikes (as well as manual bikes) was theft. To make e-bikes a viable option, we suggest the City invest in developing secure, enclosed bike parking spaces, such as bike lockers with security cameras, throughout Eugene. We also suggest, if possible, offer subsidized bike parking in front of businesses (similarly to how street car parking is provided without businesses having to pay for it). Based on the focus group and survey data, we believe that outdoor, unmonitored bike racks won't be adequate if the City wants to facilitate a significant shift to e-bikes and that having widespread enclosed bike parking is critical.

Finally, focus group participants were interested in how e-bikes related to and could complement existing public transportation such as LTD. Based on their thoughts and concerns, we suggest looking into developing an e-bike rideshare program that could connect LTD stops with low service areas and coordinating with LTD to make sure that e-bikes can be conveniently transported on buses.

## Infrastructure Recommendations for EVs

The need to build more electric vehicle infrastructure is another key recommendation. As stated in the, "Seattle Barriers to Electric Vehicle Adoption" section of the report, "garage orphans," or those without consistent private off street parking, are barred from having a smooth transition from combustion engine vehicles to electric vehicles, (Seattle Office of Sustainability & Environment). To limit this barrier, we recommend that the City of Eugene requires appropriate EV infrastructure within new housing developments via housing code changes. These housing code changes would be most impactful for higher density housing such as apartment buildings or complexes and other multi-family dwelling units. This code change could require the provisions of EV charging parking spots and/or appropriate charging outlets for residents to purchase their own chargers.

The city has identified charging infrastructure actions, similar to our recommendations, in *Eugene's Electric Vehicle Strategy*, (City of Eugene Transportation Planning Department). The similarities of our recommendations to those of the city, goes to show the importance of these charging infrastructure actions in new housing developments for EV adoption.

The purpose of this recommendation is to make the switch to EVs a smoother process for those living in higher density housing, who may not have access to their own private garage and/or other private off street parking. This recommendation's time table relies heavily on the city's ability, and overall approval, to make these housing code changes, for planned housing developments. This recommendation will have to be carried out by the planning department, to develop the exact changes to the housing code, and would need to be ratified by the City Council for implementation. In the short term, this recommendation may not have a huge impact because Eugene as a whole is switching to EVs at a slow rate and may take some time for the code changes to impact new housing developments. However, in the future, when Eugene hits its EV adoption goals, this will have a large impact as it will allow those not living in single family homes to comfortably own, and charge, their own electric vehicle.

Additionally, gas stations were described by focus group participants as effective locations to require EV charging stations. Requiring and/or incentivizing gas stations to offer at least one charging station would increase the visibility of charging stations by vehicle users and could ultimately help facilitate the transition to an EV-based world as gas stations become less relevant.

## Public-Private Partnerships

The city of Eugene should partner with local businesses to facilitate credits and rebates to prospective e-bike and EV owners. The UK Cycle to Work Program should function, in many ways, as a model for a partnership between employers, the city government, and cycling advocates/nonprofits for the city of Eugene. However, its ability to inform the city of Eugene should not be limited to bike policy but as an incentive structure through employers to streamline city policy initiatives. The UK program primarily subsidizes the upfront costs of regular bikes, but could easily be adopted for electric bikes as well.

The city should incorporate an easy to use website that allows businesses to see how they can partner with the city and for workers in the city to see how they can access credits and rebates. The UK 's program has an easy to use website that should guide the city in how to make an online space that is amenable to employers and employees. It is quite easy for those looking to partake in the program to see how much money they will save. Additionally, electric bikes have a much lower carbon footprint than EV's. It would be beneficial for the city's website that displays subsidies for EV's and e-bikes to display them in comparison to each other. Framing them online in a way that encourages comparison and portrays them as alternatives could encourage adoption of electric bikes in place of electric vehicles to meet the city's broader climate goals.

The city should have a parallel program for electric vehicles. It could partner with electric car sellers in the area, transportation organizations that are advocating for a transition to electric vehicles, and employers to implement a similar program for electric vehicles. However, electric vehicles are already subsidized by state and federal programs, as listed within the Greenpower section of EWEB's website. Therefore, business partnerships could be an effective way to reach out to employers and incentivize adoption of electric vehicles. In other words, the city should offer the online resources for residents to be able to calculate what rebates could be available to them.

The city of Eugene states that it is hoping to “triple the number of trips by foot, bike, and bus by 2035,” and on the “Transportation Options: Strategies for a Growing Eugene” webpage, the city articulates a plan to explore “if and how employers could be incentivized or required to develop transportation programs that would reduce the number of employees driving alone to work.” Luckily, Eugene's own Mountain Rose Herbs has already developed a robust transportation policy that has significantly reduced the carbon footprint of traveling to work. Mountain Rose Herbs offers “substantial cash incentives to all employees who carpool with fellow staff members, ride the bus, bicycle, or walk to work.” They also offer additional bonuses for those who log the most miles in each category. The city of Eugene could partner with local employers in a way that mimics Mountain Rose Herbs' program. However, the city also has an objective to adopt electric vehicles. The city should assess how much it wants to prioritize different modes of transportation and how its monetary incentives should mirror that. Mountain Rose Herbs already offers varying amounts per mile based on the mode, and the pricing model could be easily adopted to include electric vehicles as well. The city should also conduct a thorough examination of Mountain Rose Herbs' Alternative Commute Program to discern the precise applicability for broader city adoption.

### Rebates and other monetary incentives:

To improve the equity of widespread use of EVs, consider expanding rebates/tax credits with income caps ( $\leq 80\%$  median annual household income) beyond just the Oregon Charge Ahead Rebate. This recommendation is based on the findings in one of our case studies, in which the data showed that EV rebate usage expanded beyond just high-income earners after an income cap was added to their rebate program (Guo and Kontou, 2021). We're unsure how applicable this recommendation is at the local level and we imagine that it would be a long term goal, as it may involve advocating for these rebates/credits at the state and/or federal level. With this in mind, this recommendation would likely be better suited to the Oregon Department of Environmental Quality rather than the City of Eugene. Adding more rebates/credits will require increased funding, but otherwise implementation should be easier, since there are already state rebate programs in place. Furthermore, if the Build Back Better bill passes through the budget reconciliation process, new funding should be available to increase the funding and capacity for expanded EV credit/rebate programs. We expect this recommendation to be harder to accomplish, but it could have a significant impact for low-income residents. Effectiveness would be maximized if low-income residents were well-informed on EV rebate/credit opportunities available to them.

Creating a rebate program with an income cap ( $\leq 80\%$  median annual household income) for e-bikes could also boost purchases from low-income buyers. As of right now, there are no financial incentives for residents to purchase e-bikes, which is problematic since e-bikes could be a much more viable option for low-income residents than EVs. The timeframe of this recommendation is dependent on if it's implemented at the local level, availability of funding, and the level of difficulty of setting up a new program like this. We'd like to see this program implemented at the local level, if possible, because it would be a real step forward in meeting Eugene's specific EV/E-Bike adoption goals and climate goals. If this seems like a feasible project for Eugene, the city should look to the low-income e-bike rebate program that the city of Corvallis just implemented (City of Corvallis Oregon, n.d.). We recommend that the city look at the "Empower Benton County: E-Bike Rebate Program" (Corvallis-Benton County Economic Development Office, n.d.) webpage for more specific details on their program. If this can't be done at the local level, a program like this would probably fall to the Oregon Department of Environmental Quality. As mentioned above, the main resources required for this would be funding and capacity to set up this program. However, there is hope that resources for an e-bike credit/rebate program may be provided as part of the Build Back Better Act (Duncan, 2021). Again, a rebate program like this has tremendous potential to expand access to low-income residents, but total efficacy would require well-informed buyers.

## Opportunities for Further Research

Given our research's limitations, we suggest that the city consider doing further research and outreach to non-English speaking residents and residents with disabilities. Although we made our survey available in the five most commonly spoken languages in Eugene besides English (through auto-translation), we suspect that we did not adequately capture data from these residents. Furthermore, we didn't consider intentionally targeting people with disabilities in our research, but this group may face different barriers to EV and E-Bike adoption. Pursuing equity is a continuous responsibility, and as such, we expect that this kind of research and outreach will be a long-term commitment for the city. Since this research specifically pertains to EVs and E-Bikes, we assume that the Transportation Planning Department would continue to oversee it. The level of ease and resources required for this will depend on the depth of the desired data and whether the city decides to do perpetual equity-monitoring in this project. These same factors will determine how impactful this action will be.

Another way the city can expand on the research we have done is by integrating an equity scoring system in their auditing of the EV and E-Bike adoption as part of the climate goals in Eugene's Climate Action Plan (CAP 2.0). This might include a scoring system similar to CalEnviroScreen (CES 3.0), which is described as "the product of the average pollution burden (average of exposure and environmental effects) and [census] tracts population characteristics (average of sensitive populations and socioeconomic factors)" (Guo and Kontou 2021, 3). Guo and Kontou (2021, 3) go on to say: "The higher the CES 3.0 score, the greater the burden the community faces...The top quartile of census tracts with the highest CES 3.0 scores [represent disadvantaged communities]." We envision this scoring system being used by the Transportation Planning Department to audit EV and E-Bike usage for the CAP 2.0 annual

report. Developing a scoring system like this will be a long-term goal, since it is likely to take a significant amount of resources and organizational capacity. Taking this action would authentically hold the city accountable for environmental justice in the transition to e-mobility.

## Conclusion

Over the past ten weeks, our team used case studies, a survey and a focus group to research the barriers to EV and e-bike adoption in Eugene and how these barriers vary for marginalized communities. Our survey indicates that, overall, residents are most concerned about access to charging, battery lifespan and maintenance and cost when it comes to EVs, and theft and safety when it comes to e-bikes. Though our survey respondents weren't diverse enough to provide definitive data on how marginalized groups experience barriers differently, it did indicate that low-income residents and renters ranked cost for EVs and theft for e-bikes as especially high concerns and that people of color and low income people put more emphasis on access to information.

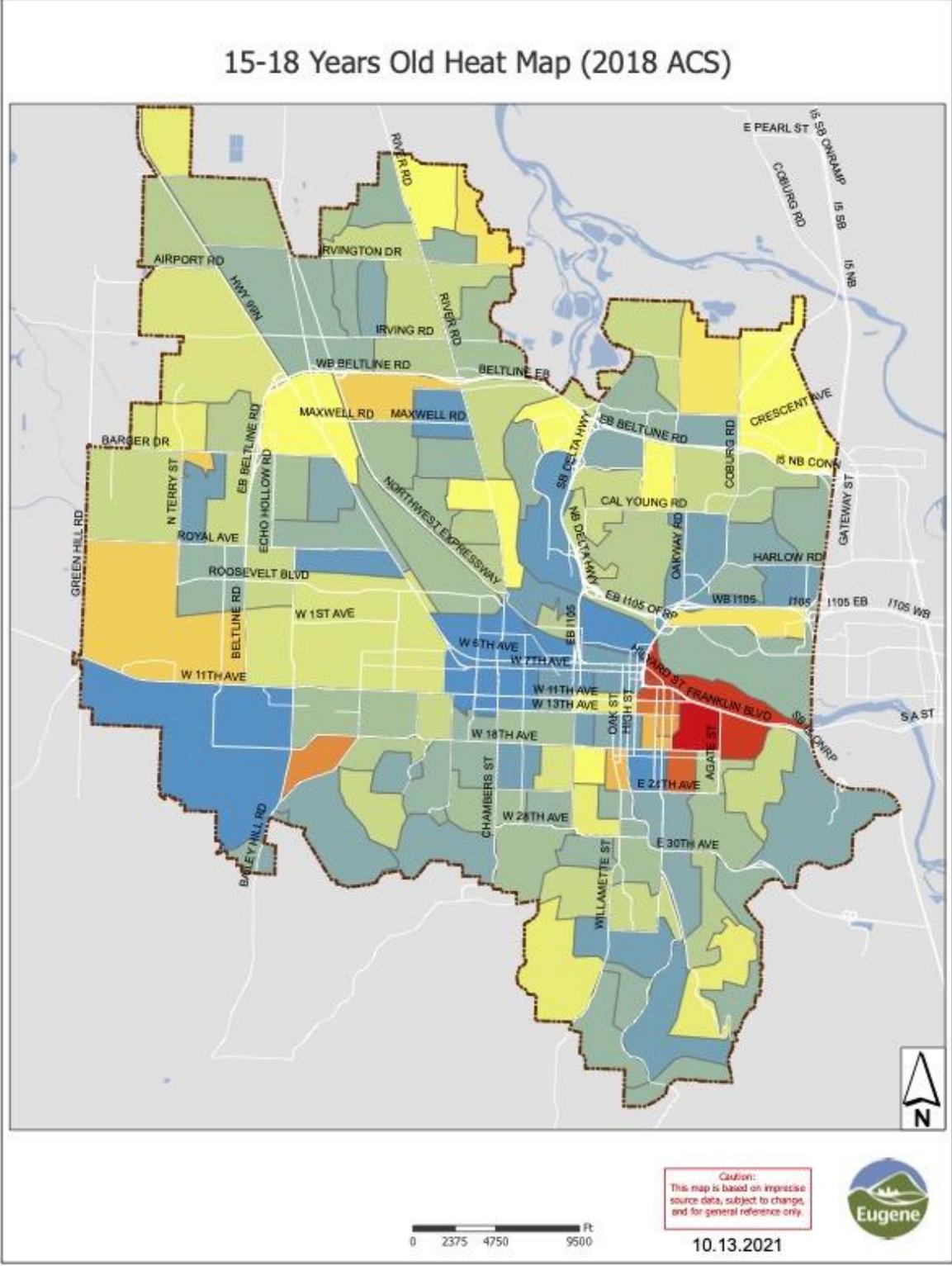
We provide a range of potential strategies the City of Eugene could use to increase EV and e-bike adoption. The options we suggest include: education, including targeted outreach to certain groups and opportunities for residents to try out EVs and e-bikes, developing safer bike infrastructure and secure, enclosed bike parking, using coding and/or incentives to increase charging stations at or near multifamily housing units and gas stations, expanding rebates and financial supports and conducting further research. We hope this research and these recommendations will help the City facilitate an equitable transition to electric transportation throughout the city.

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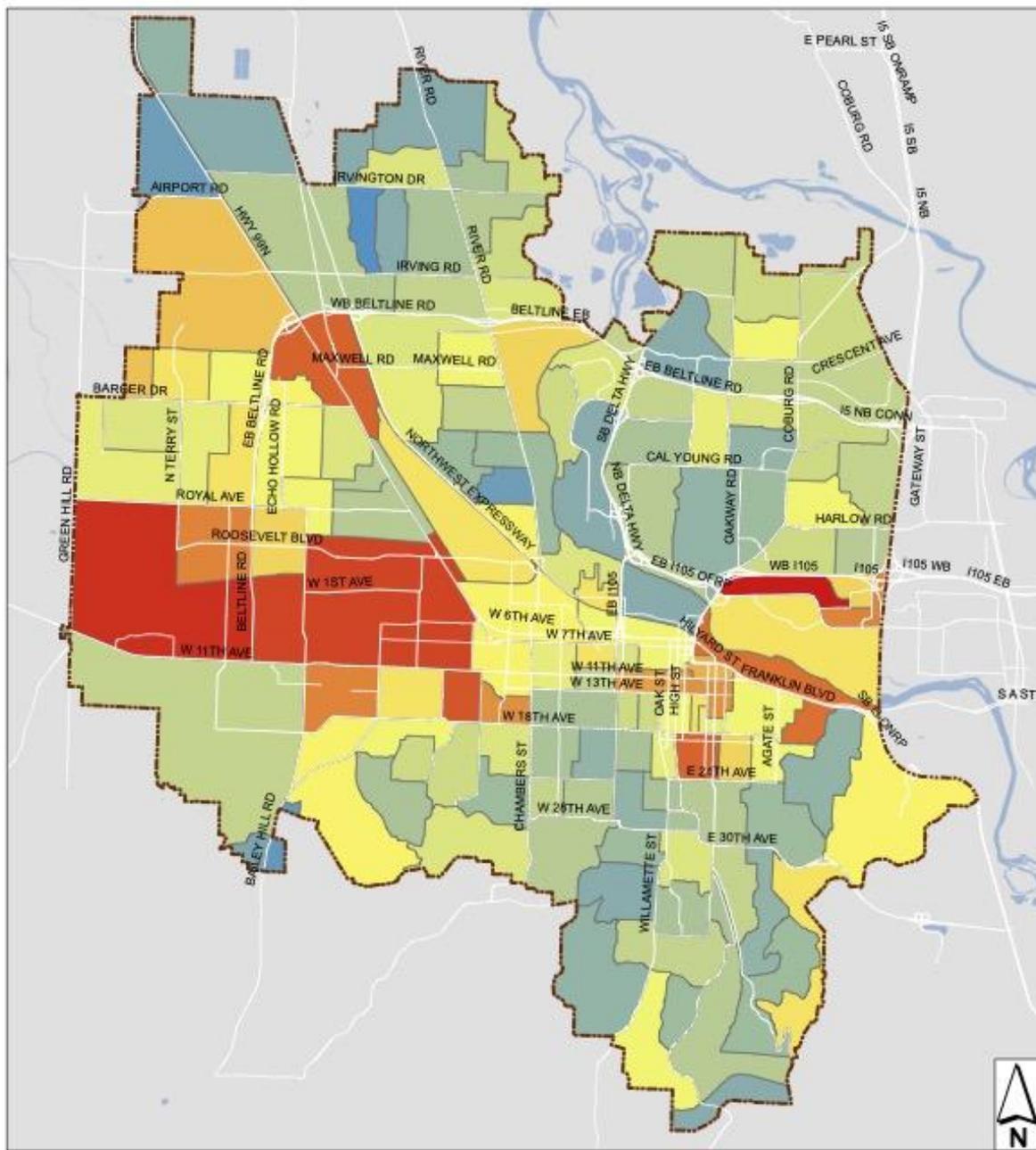
# Appendix A: Key Demographic Maps<sup>1</sup>



<sup>1</sup> All heat maps are from the [City of Eugene Planning Department](#) and were provided by Logan Telles. These heat maps are generated from the [Census](#) and the [American Community Survey \(ACS\)](#) data.



### Community Members of Color Heat Map (2020 Census)

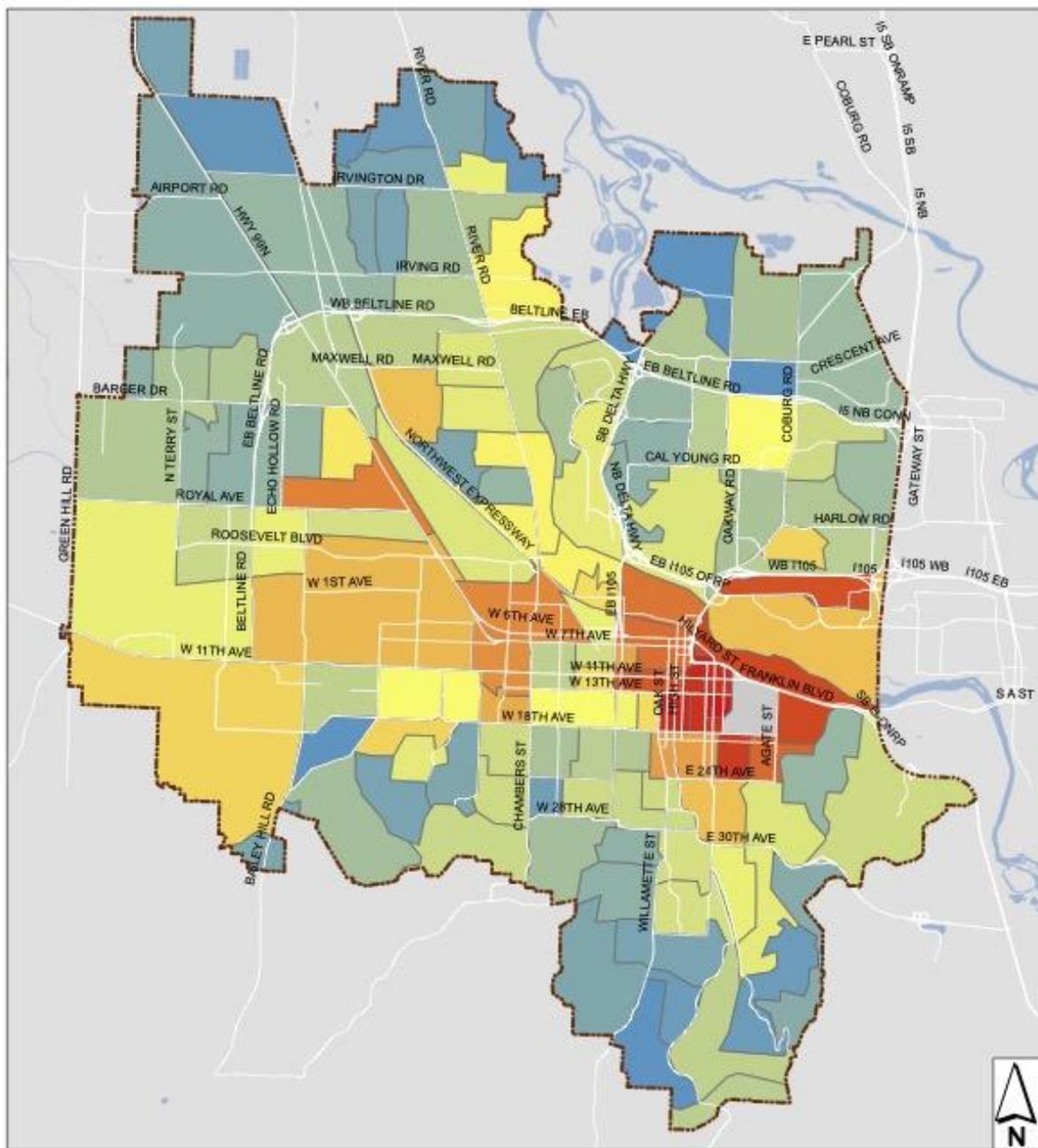


Caution:  
This map is based on imprecise  
source data, subject to change,  
and for general reference only.

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### Household Poverty Status Heat Map (2018 ACS)



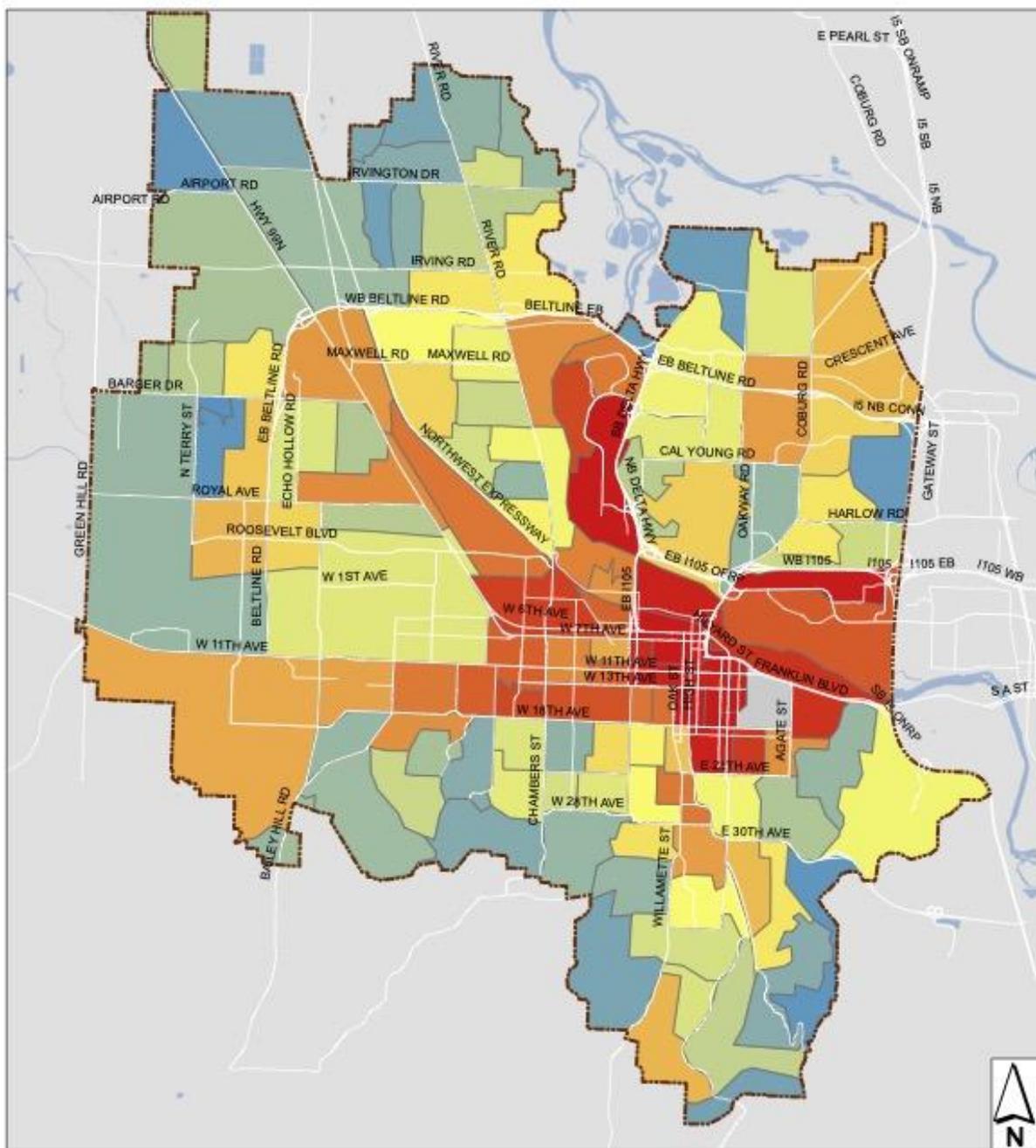
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### Renter Status Heat Map (2019 ACS)

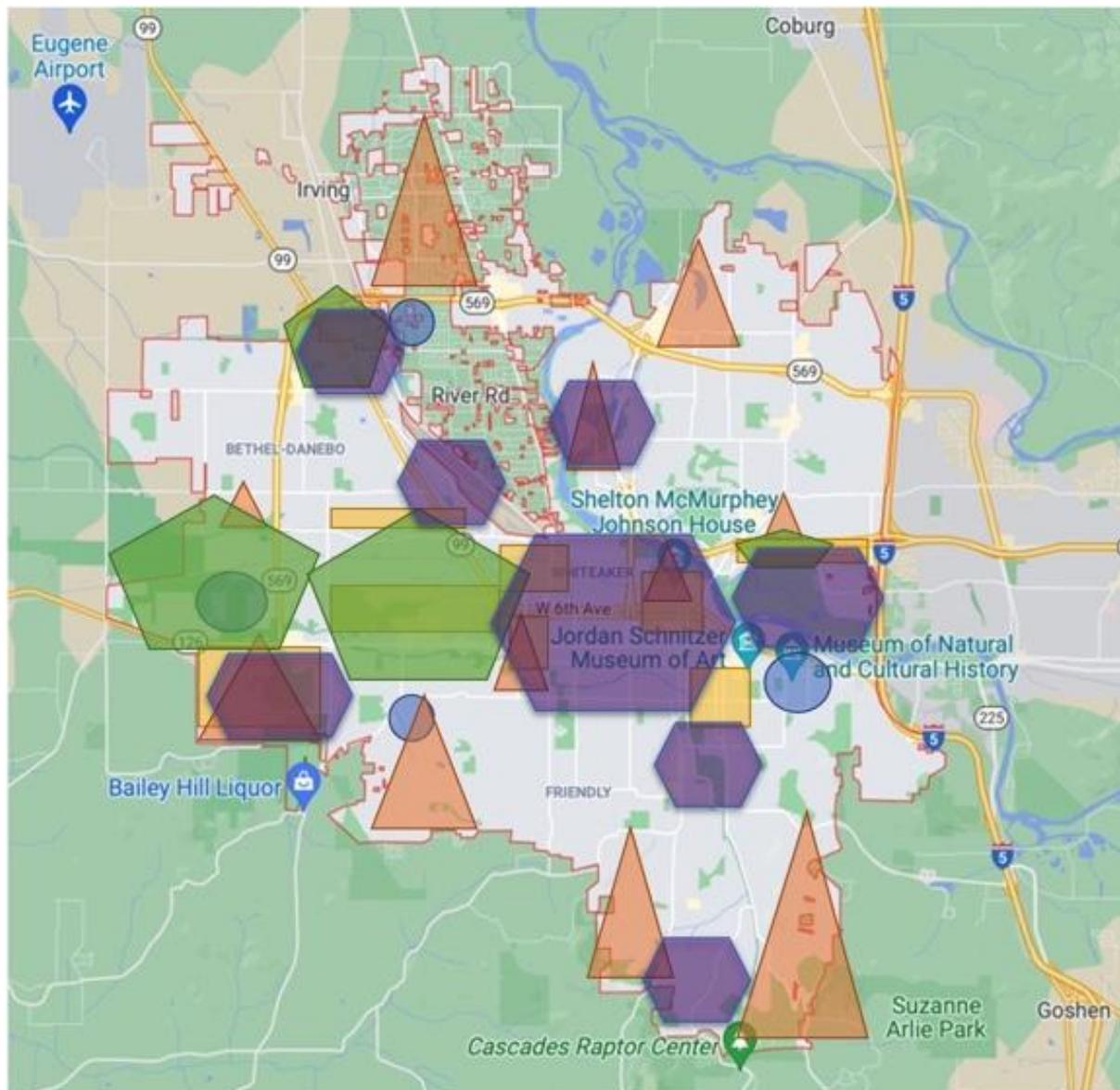


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source data, subject to change,  
and for general reference only.

10.13.2021



## Demographic Maps Overlap



### LEGEND

- Blue Circles: Ages 15 to 18
- Yellow Squares/ Rectangles: Household poverty status
- ▲ Orange Triangles: Ages 65+
- ⬠ Pentagons: Community Members of Color
- ⬡ Hexagon: Renter Status

Figure 1: Demographic Maps Overlap

## Appendix B: Eugene Neighborhood Association Map

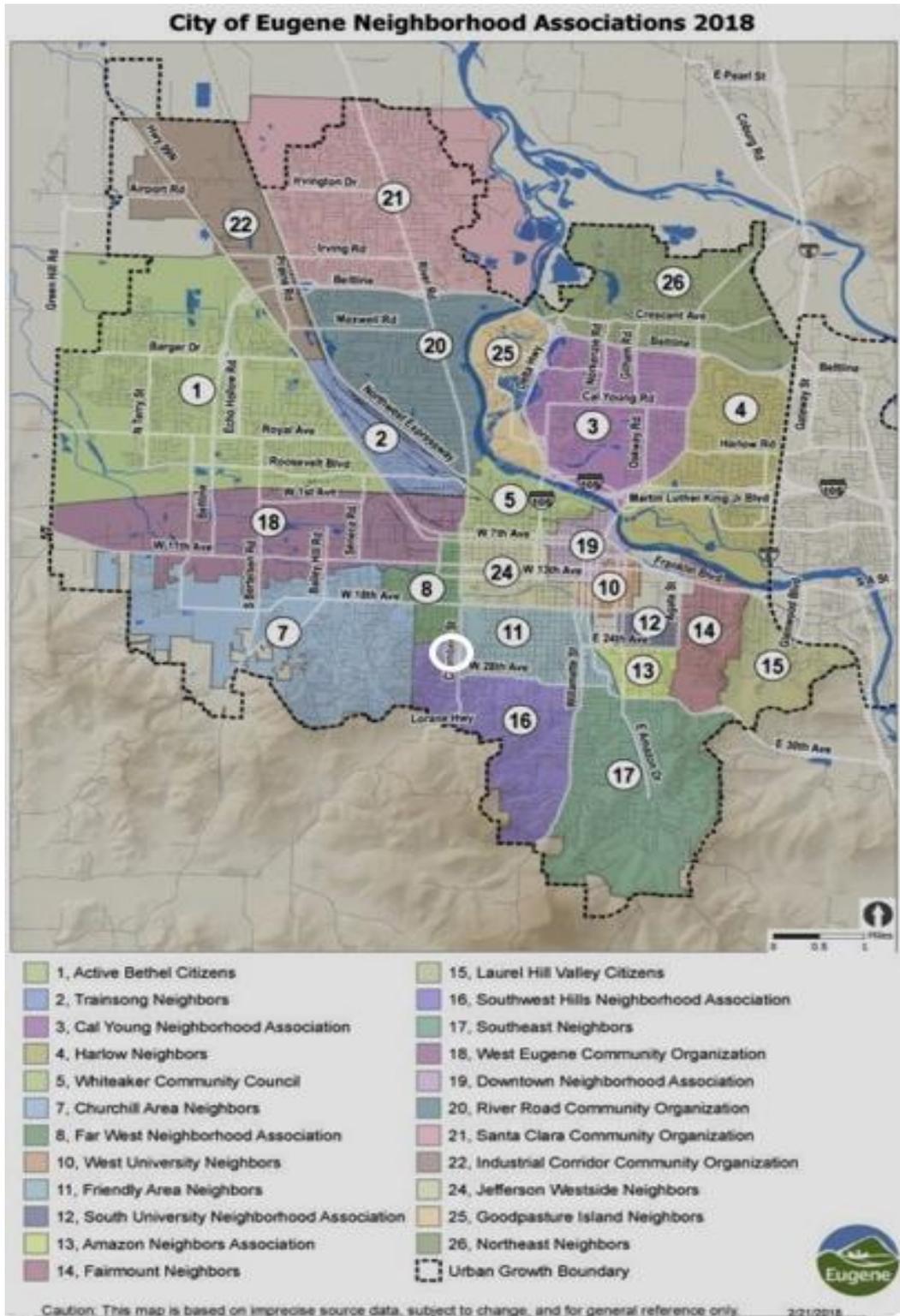
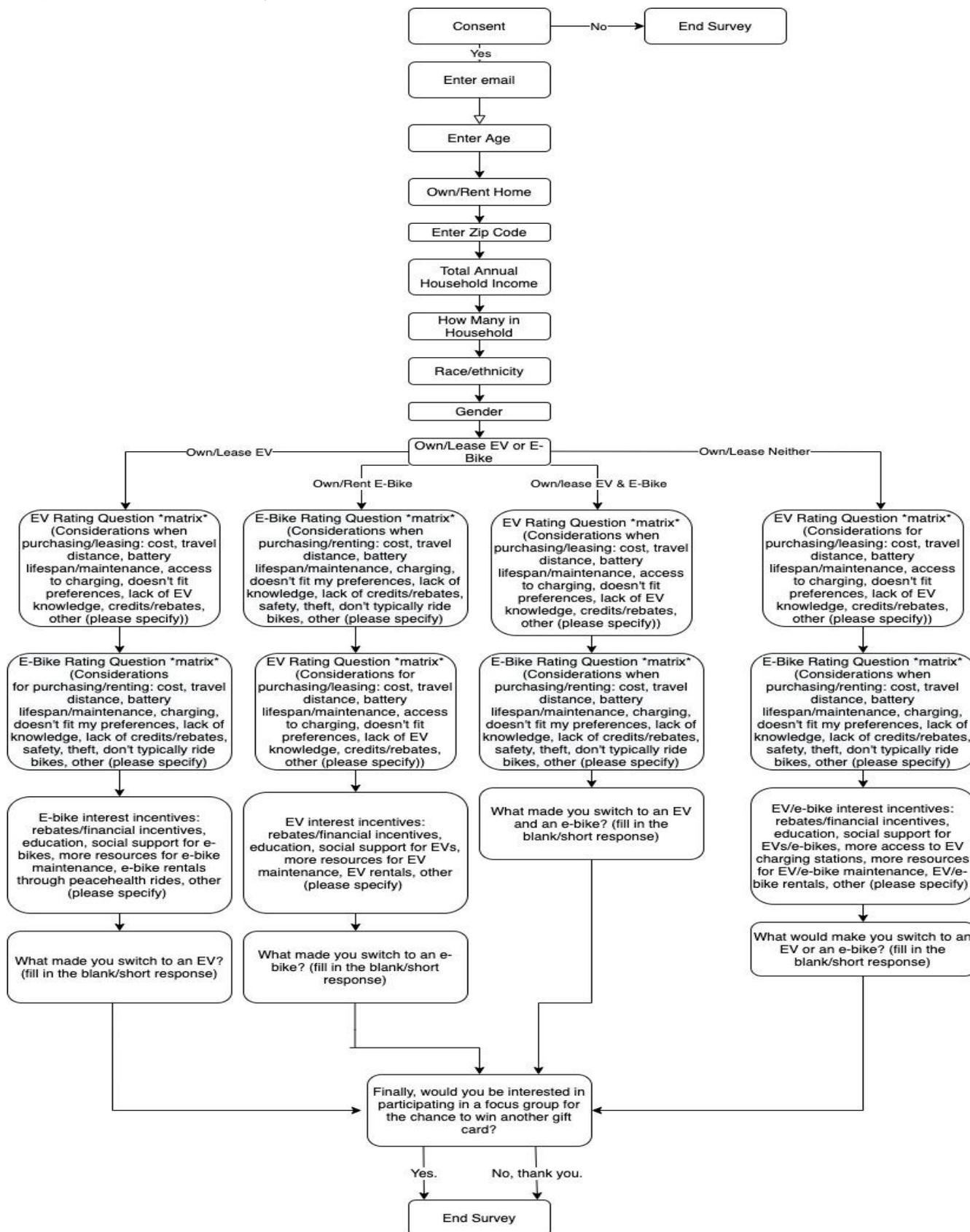
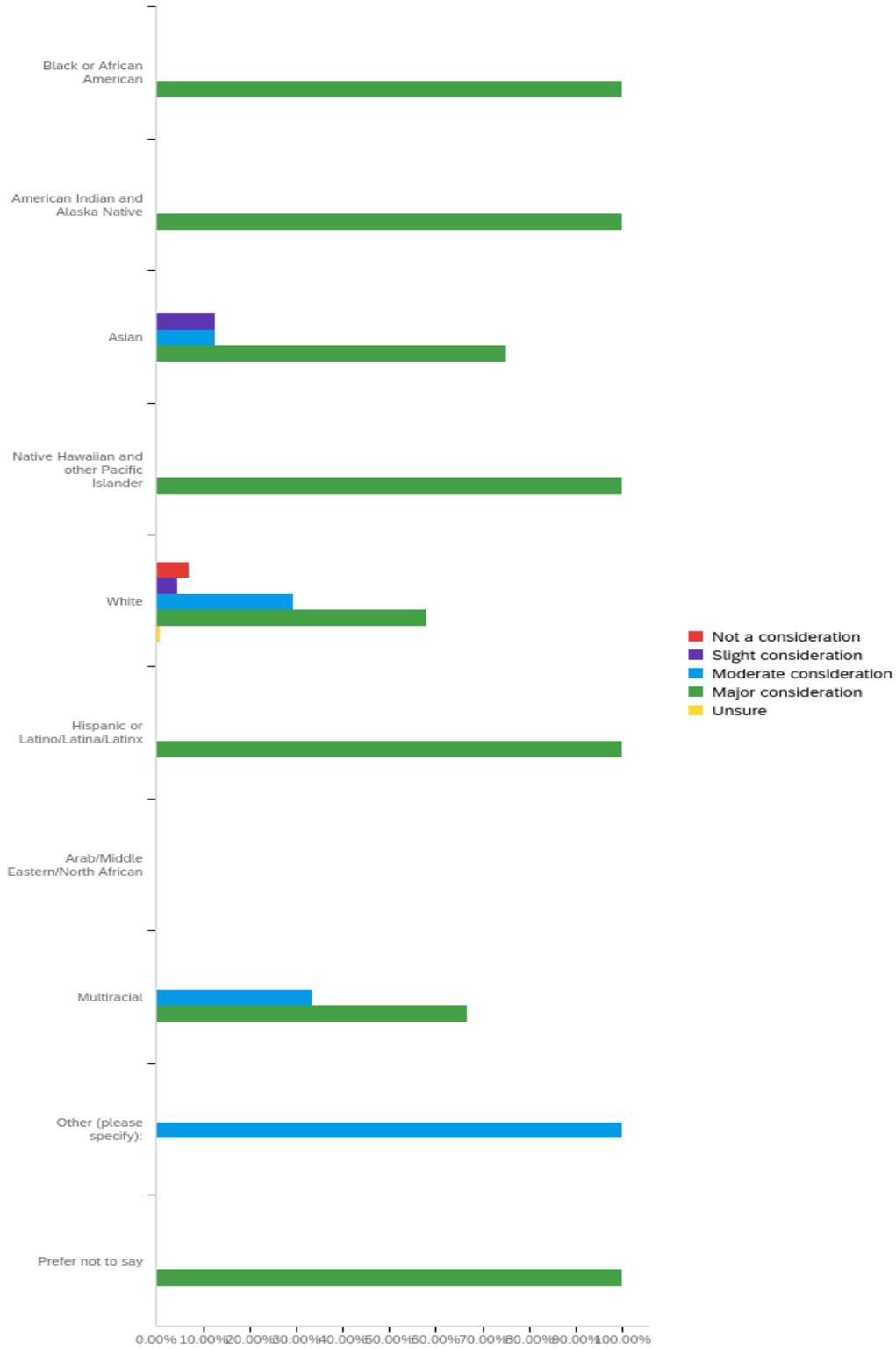


Figure 2: City of Eugene Neighborhood Associations

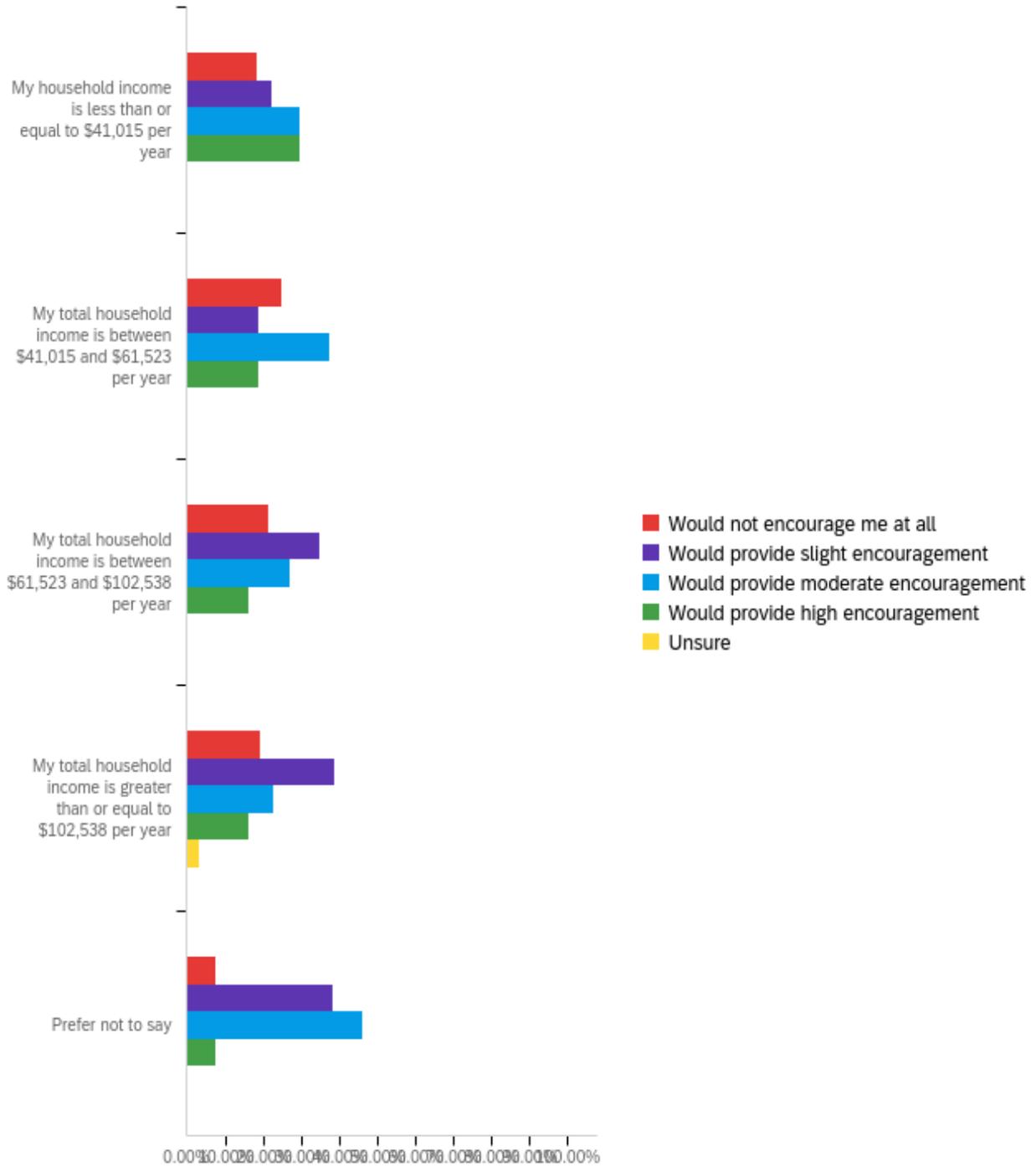
# Appendix C: Survey Flowchart



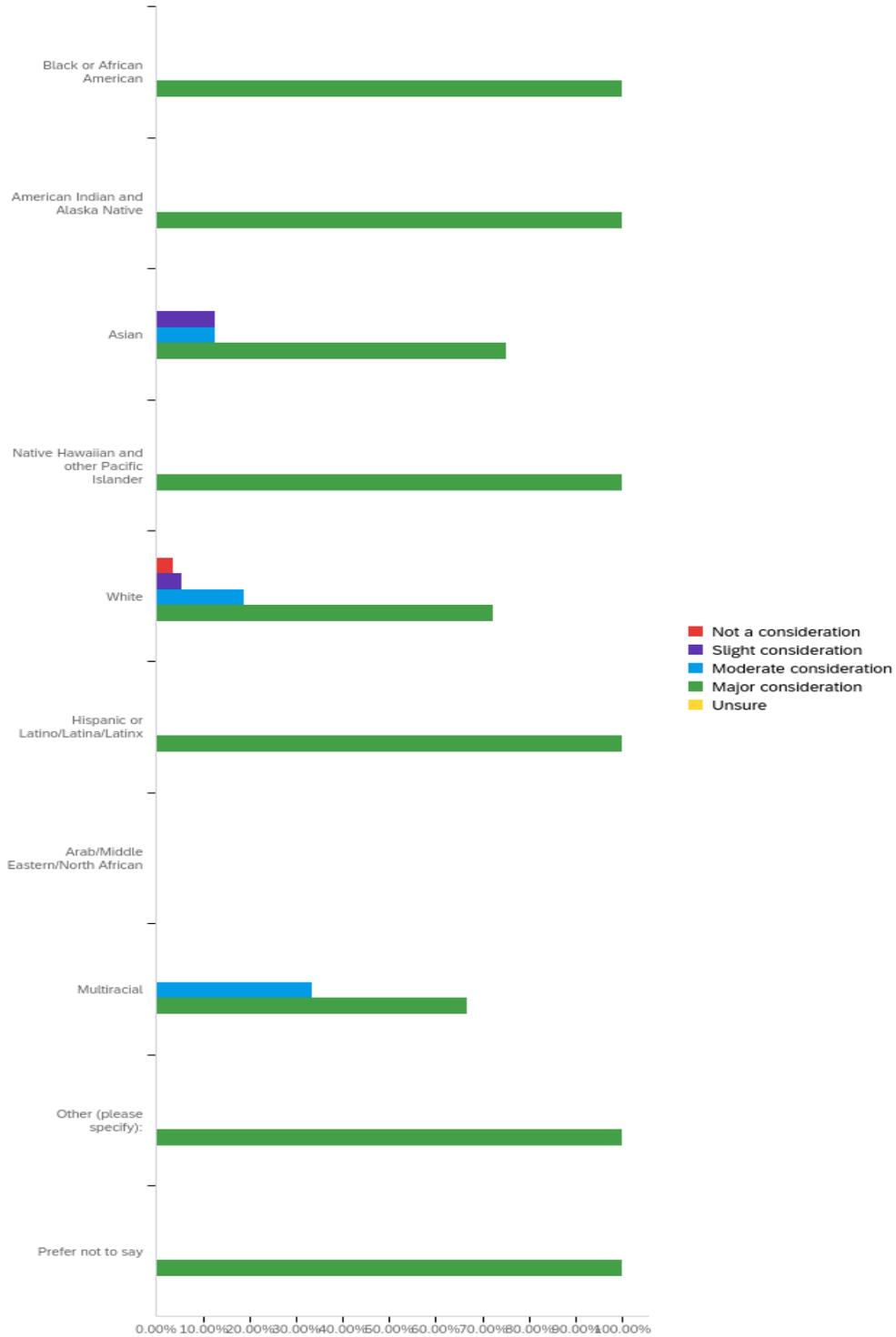
# Appendix D: Battery and Lifespan Consideration by Racial Group



## Appendix E: Education as a Consideration by Income Bracket



# Appendix F: Access to Charging Stations Consideration by Racial Group



## Appendix G: Coded Focus Group Transcript

**Question One: What are your thoughts on safety for e-bikes? What sort of bike infrastructure would allow you to feel safe using one?**

### Categories

Concerns about acceleration

Questions or concerns about where e-bikes ride

Theft

Questions about what e-bikes can transport/pull

Protected bike lanes

Transporting bike on bus

### Overall suggestions

- Education on where e-bikes ride and keep them off sidewalks
- Education on what type of lock needed to keep it safe from theft
- Protected bike lanes — better general bike infrastructure
- Education around transporting bikes on a bus

Tricia: I don't know if E bikes are only allowed on the street or on the sidewalk. So I suppose it's not too much different from regular bikes, but I guess my first thought about e-bikes and if they have throttles is like sudden acceleration of bikes when you're not expecting them to accelerate. So that would be one of my thoughts. So the infrastructure might be if the city made it regulation that e-bikes had to be in a bike lane, or on the street rather than on the sidewalk.

Tricia: Then the other thought I had was, well, the same thought I have about bicycles. That's an expensive bike. And they get stolen all the time, everywhere you go. What kind of expensive lock is going to be needed? And what happens with the battery?

Danika: Or if there was better parking options in general for bikes, that was a little bit more secure in some areas.

Tricia: Do e bikes pull things? Are they able to pull? You know, carriers or child carriers, things like that?

Claire: This is Claire again, just to kind of chime in to the discussion, I would say that the kind of bike infrastructure that would increase safety for residents would be protected bike lanes, you know, not just paint striping, of course.

Tricia: One would be whether it can be put on a bus at the front of a bus like other bikes, because if you run out of your E, your electricity, just like if you get it or if you get a flat tire, I've always felt good that I could walk it to a nearby bus stop and put it on the front of a bus and get home with it or get to a shop with it. And if the bus driver is going to help you put it up there if it's too heavy for you to lift?

## Question 2: Are concerns about theft preventing you from using an e-bike? What sort of resources would help you feel more secure and less vulnerable to theft?

Categories:

Enclosed spaces

Providing free bike parking for businesses

Having bikes without parts that can be removed and stolen

Suggestions:

- Have indoor spaces, possibly with security, to lock your bike, nearby locations like grocery stores.
- Providing free bike parking in front of any business that wants them

Danika: If there were enclosed spaces that you could lock them up, maybe in a semi indoor type of thing, or, I don't know, the cage thing is an option, but they're not everywhere, but maybe more of I don't know, sort of semi-building type thing. So they're not visible immediately.

Tricia: Even a, you know, there are parking garages downtown, or even like an enclosed area with somebody hired to be there and have them in central locations like years, you know, shopping areas. Because I don't ride my bike to even a grocery store, I only ride my bike for exercise, or I used to ride it to work where I could take it inside, I don't ride my bike anywhere where I have to lock it outside. And that prevents me from using it to get groceries and things like that.

Danika: That's the same for me.

Claire: I also want to second the indoor parking garage idea. And I just dropped a link in the chat, there's an underground parking garage for bikes in the Netherlands, which, obviously, they're way ahead of us in terms of bike infrastructure. But you know, something like that kind of comes for granted for cars, making that more of like the bike world as well. And then another thing would be working with businesses to make sure that every single business that you know, wants to have by parking in front of their business, and ideally by parking that they would not have to pay to put in, because you know, we think about car parking, they don't have to pay to put in a parking spot in the side of the street side of the road. It's just kind of there. And so doing away with some of that transportation and the quality of parking safety.

Tricia: Well, I think if there's not a lot of things on it, that can be easily taken off. In other words, if the seats are, you know, somehow locked on there, if the battery somehow can't be, you know, taken off, I don't know. I don't want to have to take off five different things and carry them inside with me.

## Question 3: What kind of activities could you see yourself using an e-bike for?

Categories:

Replacing a car for shopping trips

Recreational trips

Routes that are too hilly to use a regular bike on

Biking when you're older

Pulling kids around

Suggestions:

- When creating communication materials about e-bikes, highlight how they allow people to bike through hilly routes, bike when older or injured and transport children or cargo.

Terry: No having to use a car for shopping.

Tricia: Going to the theater, you know, to movies or theater or recreational places to go and then hike.

Danika: I would be able to take different routes around town that I don't ever take on a bike because they're hilly.

Miles: Yeah, the hilly tall, maybe an upland where it's hilly, or just maybe a normal stroll that I wouldn't want to use my legs. So I'm going to use the e-bike.

Claire: I'm gonna also jump in and say hilly as well. Although I'm lucky to live right next to the bike path and the Whitaker you know, it's a barrier going to South Eugene, sometimes because of the hills. But also, I could, you know, see the activity of like growing older, you know, happening, obviously, for use for E bikes. I want to be able to bike my entire life. I don't own a car. I don't really want to own a car. But as my body continues to ages, I want to have a bike that can take me where I need to go.

Danika: Yeah, I could imagine it would make it easier, carrying a little kid around on the back of the bike for pedaling.

Subquestion: replacing cars or bikes?

Miles: To me, it's like replacing many things because it's more of like a car, having two legs, you know, things like that. So it's kind of so many things, like so many just like a combination of everything, the car, the bike, the train. Except for the plane of course.

Tricia: It would replace the car, short car trips, you know, in town car trips.

#### **Question 4: How accessible do EV charging stations seem where you live and work? How concerned are you about charging electric cars?**

Categories:

Concerned about traveling out of town in an electric car

Don't know how accessible they are but are concerned about it

Need a way to clearly identify charging stations

Confusion about how charging works

Having charging stations near gas stations or convenience stores

Questions/concerns about the cost of charging

Having charging stations outside of the city, near nature/recreation areas

Challenges for renters

Having charging stations at schools and community centers

Suggestions:

- More education around where charging stations are in Eugene, a map of all stations in Eugene if that doesn't already exist
- Information about where there are charging stations outside of Eugene
- Education about the cost of charging and how it works.
- Requiring gas stations to also have a charging slot

Terry: Does the Arcimoto vehicle count as a car? I mean, I've just seen them. I've no idea about it.

Tricia: I don't know how accessible they are. Except, I will say the only ones I'm aware of are in the parking garage at the public library. Because I parked down there and saw them. But because I don't have an electric car, I don't know where they are. And that's one of my main concerns, as far as using an electric car to travel out of town.

Barbara: I think I think that there's you know, I was looking at a lot of stuff about EVs a number of months ago, so I can't really remember where I saw this, but they're online maps that show all car charging stations, specifically along highways and there are maps that you can like plug in your, your itinerary and it will give you every charging station along the route. But I'm not sure about within a city if that if there's the same thing, but I imagine there will be because that definitely is something that could be easily you know, easily determined where they are and then put up for everybody to access that information.

Tricia: Or even have some kind of symbol. You know, like gas stations, you see a gas station coming because you see a certain kind of sign. So if the charging stations had some kind That tall, I don't know, call with the orange flag or, you know, something that you recognize. Yeah,

Barbara: Is the city of Eugene planning to put in more charging stations, do you know?

Barbara: If you're not, you know in the position to use one you're not going to notice where they are. I've seen at least five.

Tricia: The infrastructure bill that the President just signed is to contribute a bunch of money to states for charging stations to this end. I learned about charging at home. Because I've heard different things. Like one person will say, I just plugged my car into the regular outlet, somebody else's like I had to have this special something, you know, outlet installed in my home in my garage so I don't know about that.

Barbara: Depends on what kind of vehicle you have. And how fast you want it to charge.

Claire: I wanted to say something. So there's one down the street from us. There's a gas station that they're going to be completely like remodeling and there was some public feedback and we were telling them because they're going to be putting in like a more of a grocery store there that they should put in public charging in front of the shopping that because people will stop and maybe buy stuff there. Because they're doing the gas station and our idea was that most of the gas stations should also have at least two charging slots there. So people can stop and charge there as well. Because at some point in the future, the gas stations will become less relevant.

Barbara: And convenience stores would be wise to do the same thing.

Tricia: Do charging stations charge money to use them?

Claire: Usually, but it's like 15 cents versus you know how much gas costs. It's very, very cheap.

Tricia: maybe out at some recreational areas that are out of town? Like if you want to go to the Wildlife Refuge, or you know, just some places in between? Are you talking about the city?

Tricia: Maybe economic incentive for workplaces to have them?

Claire: Well, one of the things is also anyone that's like a renter, you're not necessarily guaranteed parking where you rent and so the city is probably going to have to expand what they offer for charging. If you don't have charging access at your home because anyone that owns a home you can set up charging for your car. So that's another thing.

Tricia: The reason I thought of recreational areas like Alton Baker park or something is that you could plug into your car to be charged and then go for a walk. You know, so it's charging while you're I don't know if you can leave your car while it's charging though. That's another thing. If it leaves it vulnerable to something I don't know.

Terry: Community Centers...

Tricia: Community centers, it's another and school—schools that we know that you're getting one in different areas. Ah, you know, because of the school districts around the city, if you put one in every high school or whatever, then you'd have...

Barbara: In terms of equity, I like that idea.

**Question 5: What are your concerns about EV batteries? Are there any resources or information you would like to see to address those concerns?**

Categories

Cost

Replacement frequencies

Standardized information/evaluation of different batteries

What you do with the battery after it's used

Maneuverability of EVs due to the battery

Workshops

Events where people can try driving an EV

Suggestions:

- Develop standardized guide that people can use to evaluate EV batteries
- Have educational events where people can try using an EV or e-bike

Tricia: Cost and how often do they have to be replaced?

Barbara: You know, when I was researching, there's a lot of information out there. And there isn't too much that I could find in it. This was several months ago sort of standardized evaluation of different kinds of batteries and

different you know, all of the things that people have developed. The other thing is it's very fast developing so I never know what's the most up to date information. And so, you know, just having some resources that you can trust that will evaluate the information basically, would be helpful, I think.

Claire: Yeah. Yeah, that's a great point.

Tricia: They could compare. Yeah, like a warranty.

Barbara: Right? You know, it's like, it's like you know, when you're, you're shopping for other things. We've all figured out how we evaluate you know, what's the best buy and for the EV batteries, I was unable to really feel solid about it. And then you know, all of a sudden in the middle of when I was researching the whole... I can't remember which is which but you know, the the problems with that particular EV you know, made everything st and made it seem like you had to be very careful about you know, whether you were just going to go. I was looking, I'm always looking for the best deal, because I don't have much money to spend on it.

Barbara: And so those are the best, those are the least expensive. You know, they're one end and the Tesla's together as far as I can tell. Right? And, you know, you just think oh, I'm you know, I would have to cross that off my list of, you know, I was looking for a used one, I would have to cross that off my list immediately because, you know, you don't know if you can trust that particular make. And there may be problems with other makes too. So, you know, yes. Just just a whole lot of vague and swirling and changing information about the batteries.

Claire: So based on my husband and I, our research about the batteries, they're actually really safe and they last a really long time. And often at the point when they get removed from a car they can be used for other purposes like in the grid or for home battery usage. And they can also be recycled, which is really great about the batteries. And so a lot of the stuff about like batteries catching on fire, it's far less of a thing than it's perpetrated in the news. And it's partially being sort of brought up as a thing by the gas industry that like electric cars aren't safe and which is not there. They're actually safer.

Barbara: Well, I certainly believe that way. Can you tell me where you got your most reliable information?

Claire: My husband has been reading this stuff for years. I don't. Do you want to comment? There's a lot of data about it. He doesn't NHTSA I don't know what that is.

Claire's husband: It's a big Association for the government that is measuring...

Claire: Oh, okay. It's the Association for the government that's measuring the data about the accidents and fires in cars.

Barbara: Okay, NHTSA, is that it?

Claire: Yes.

Barbara: Okay. All right. I just you know, It's not that I don't believe you, I just want to be able to get some more information than what I was getting. And this has been you know, several months ago. And of course, I understand exactly what you're saying about the media overblown and you know, blowing up things, so that you get afraid, right.

Tricia: So, I have a question about the batteries if you live in a neighborhood where no one uses their garages as a garage.

Tricia: And so we all have to park our cars outside. We people have had their catalytic converters stolen frequently, which is a big expense. So my question is, is the EV battery in a car something somebody else can take easily, or do we have to bring it inside every night? Or how does that work?

Claire: I think they're like hundreds and hundreds of pounds.

Tricia: So something like in a hybrid, like in our hybrid like...?

Claire: yeah, they cover the entire...They cover the entire bottom of the car because there's no engine. So if someone tried to remove it and they weren't like in a proper garage situation, it would crush them probably.

Tricia: I didn't know if there were different kinds of—Okay, anyway. There wasn't the big battery and then a small battery that you plugged in or something? I don't know. I

Barbara: I have a question. That is it's, you know, maybe a little bit off the point. But if the battery is covers the whole bottom of the car, I didn't know this. How does that affect **the maneuverability of the car and, you know, is it a plus or minus on ice?** Icy streets? Does anybody know?

Claire: It's good because it has a lower center of gravity so it makes it very smooth and my husband just checked the batteries weigh 1000 pounds.

Tricia : Oh. Good.

Barbara: So it helps maneuverability?

Claire: **It makes the car very like, because it covers so much surface around the bottom of the car makes the car very like smooth. That's why when you're driving an electric car, it's not as bumpy like a heavier car is like usually smoother.**

Barbara: Oh, okay. All right.

Claire: For cornering and things like that.

Barbara: Thanks for that information. That's...I like that.

Tricia: **Maybe a workshop every once in awhile. You know, they have those workshops where people take their bikes and figure out how to do stuff on their bikes, workshops like that. Thing workshops, well, you could have an electric vehicle workshop or something.**

Claire: **I think also it would help if the city offered more events where people can actually ride in an electric car. And because they feel dramatically different from fuel powered cars, in terms of like the smoothness and how stable they are, and they're also very quiet. And, you know, the fact that Hertz announced recently that they're going to be buying like 10,000 Tesla's or something so people will eventually be able to rent them. And drive**

them. But if they were more accessible, where people could experience them, I think people would understand what the difference is.

Tricia: Same thing with electric bikes. If you had a chance to try out on, you know, I suppose you'd go to a bit bike shop and they let you try it out. But also just yeah, something. I know our city councilor or county commissioner said they had the county commissioners That's right. He bikes around from around the city and then reported on it or whatever. But maybe a workshop where you could try out he bikes too.

Claire: And so funny story, I actually worked for the organization that put on that E bike event for the count. Yeah, we had mayor was out there some county commissioners, Floyd presents, he made an appearance at one point, but yeah, they had a great time and it's really it really is the experience that changes minds. You know, and we partnered with, I think it was Oregon Environmental Council to put those events and they were happening all over Oregon and I believe in like, Hood River the mayor the next day went out and bought an E bike because they have such an amazing time. So yeah, those experiences that's that's what does the work

### **Question 6: What do you know about EV rebates and credits, and are there any other financial interventions or supports that would help you get an EV?**

Categories:

Tax credits — helpful for some but not all

Buying a used EV

Concerns/questions about higher insurance for EVs

Discounts for certain groups, like senior citizens

Suggestions:

- Clarification and education on available tax rebates
- Break down of price comparison, including insurance
- Help buying used EVs

Claire: Offering more tax incentives in general will help people feel better about buying an electric car. So like the \$6,000 tax credit, certainly helps in terms of if you were leasing an electric car. That makes a huge difference.

Barbara: I'd like to speak about you know, the possibilities for low income people because I thought I would be able to get a used car I only want to be able to use the car around town and not interested in you know, taking trips or anything that would require, you know, a newer car with the, you know, better battery and all of that, that would hold longer charge and there are so few used older EVs available in my price range, which is pretty, pretty low. And it would just be nice if there was some kind of, you know, a tax rebate is not helpful to me just some other way to be able to use an EV rather than you know, right now I'm driving an old combustion car and I do not want to drive it. I would love to be able to switch over to a used EV

Tricia: Not everybody gets taxed, pays enough taxes to get tax credits.

Barbara: That's why I'm retired and I just I'm under the under the limit there, so it's kind of a strange bind to be in, because when you say you want to buy a car then...Well, I'm not going to go on and on about it, but that's what I would like to find any information. I purposely just kind of left off looking for something until this bill went through to see if there was going to be anything in the bill. I don't know yet.

Tricia: So I think I think something maybe like what EWEB does, like when you get windows and doors that are energy efficient. And you get and they pay for a certain amount of it, you know a percentage of it. You know, something like that could be good.

Barbara: But they do that for the charge you know to put in charging you know, upgraded charging thing. No, I-I'm sure that there's going to be something coming along some kind of rebate, you know, there was a rebate, it went away. And I can't remember the specifics about that but it seemed like a pretty good rebate for someone like me, but then it was discontinued. So that's what I want is information about any possibilities.

Tricia: I also want to know about insurance on electric vehicles or electric cars. Whether it's whether the insurance is higher, and if there's a way to have insurance companies not have higher insurance rates for electric cars as an incentive. The other would be a senior discount for senior citizens because often on a fixed income.

Barbara: Yeah, I looked into the insurance thing and they said the reason that the rates are higher is because they don't have enough data to you know on replacement because there isn't the acceptance you know, the the utilization that they would need to get enough data points in order to figure out what to charge, so they just charge higher.

Tricia: Of course, of course they do.

Claire: Regarding being able to buy a used EV, part of the thing is because the cars have such longevity, even when someone's like selling their EV they don't drop dramatically in price because they stay in such good condition for such a long time. So that's part of why we're not seeing used EVs that are a reasonable price for people yet because they kind of maintain their value. Yeah, so I mean, it's both good and bad, because it would be nice to be able to buy one for cheaper.

Barbara: Yeah, or you know, something like a turn in your old combustion engine, whatever and get a use. But if they're not out there, people are holding on to them I can understand, but eventually people are going to want a newer one. You know, they will add the bells and whistles that people always want and that's what I'm hoping anyway.

Tricia: Well on the rental car companies if they're going to use a lot of them don't have turnover eventually.

Barbara: That's a good point. And also, you know, there are, I did see them up in Portland and stuff. But that's hard. I mean, you can go up to Portland and get them. It's just harder for me. And, you know, maybe if they had some sort of program to bring some of those from Portland down here. I don't know. Portland and Salem has...

**Question 7: If you wanted to use an EV or an e-bike, would your top choice be buying, leasing or using a rideshare program and why?**

Categories:

Interested in ridesharing — alternate to bus system, lets more people try it

Concerns about rideshare — having to coordinate with others and checking the car

Concerns about where to get maintenance work done

Suggestions:

- Look into rideshare with EVs for those who don't want to or can't buy a car and to give more people the opportunity to try EVs.
- First & last mile connectivity to public transit

Barbara: Can you explain a little bit more about what the choices would be like. I mean, leasing a new one obviously, right? Buying would include used and new? And then rideshare... How would... Can you expand, expand on that a little bit?

Olivia explain ridesharing

Barbara: Oh, that's a good explanation. And for me right now, that actually would be something I would, you know, be pretty interested in. I haven't been during the pandemic, but I'm also a pretty dedicated bus rider. I think that we should be using the bus system a lot more than people do. Yeah. And having access you know, having kind of a rideshare access to... because the bus systems at LTD simply can't provide access to all the neighborhoods equally. They don't have the funding to do that. And that they don't have the ridership, certain areas I moved into, I used to use it constantly, you know, completely and then I moved into an area where I don't have very good bus service and being able to just have a rideshare or whatever. The Zipcar idea to the bus system would be ideal for me. Because then I wouldn't have to worry about all that other stuff.

Barbara: Yeah, not too many people ride the bus in this town and I understand why but I think it's I think we should definitely support not supported if you can't, but you know, there should be more use of the bus system, because it's good. They just don't have the funds to provide it for everybody. And so people just kind of don't even bother with it.

Tricia: Yeah, so I prefer, if I had to choose this, I would probably choose buying or leasing over rideshare. The leasing I just feel like it's going to be more expensive. And plus you have to get to where you lease it from. And I would like to just walk out of my house and get in and go as far as the cars I'm talking about. Well the bike too I think, the-the E bike I might do one of those like the PeaceHealth things, maybe probably would still prefer buying. Ride share programs as far as cars, you know, where a group of people have it or whatever. I don't like I just don't like having to coordinate with other people a whole lot. And I also ride share...okay, I look worked in the in the field of criminal defense for a long time and I'm not comfortable getting in cars that a lot of other people have been in not know I feel like I would have to search the car every time by make sure there's not like some drugs under the seat or something. So yeah. That might sound weird, but just don't like yeah, other cars other people have been driving a lot so

Claire: Because the cars maintain their value, buying outright if you're able is the best thing because with leasing you'll end up paying more over time. But the benefit of leasing is that you could then switch the car like upgrade it faster, potentially. But the rideshare option, even though I agree yeah, I didn't even think about wanting to search the car. It does make it so that more people that wouldn't be able to have access to this car could experience it. So that's nice. The community could have more experience with electric cars.

Tricia: I'm not saying they shouldn't have rideshare programs. I'm just saying I wouldn't use it.

Claire: I'll just jump in and say my preferred top choice would be rideshare because you know it's like that first and last mile sometimes that live just would be really, really nice to have a ebike to jump on to like you know,

get through that hairy intersection that's not fun to try to pedal really fast on a an acoustic bike, as I've heard them called. Hopefully that catches on I didn't make it up. But...

Tricia: I think that's a good term. The only other thing about cost that wasn't discussed and I'm sure that'll change over time is is besides the higher insurance and the cost of it to begin with is the repair cost of places you know a lot of the regular garages might not have the expertise yet so you have to go to the dealership for a while.

Barbara: I read that there's very little repair usually necessary on electric vehicles

Tricia: Our hybrid doesn't have much repair and all

Barbara: that maintenance that you have to do on a combustion you know, the oil and the trans— you know all that stuff. You don't have to do so. I read it's just like basically tires. That's good.

## Appendix H: Eugene Neighborhoods with Key Demographics Chart

<b>Neighborhood Association</b>	<b>General Location in Eugene</b>	<b>Key Demographics</b>
<b>Bethel</b>	West Eugene	Household Poverty Status, Community Members of Color, Renter Status, Age 65+, & 15 to 18 Year Olds.
<b>Harlow</b>	East Eugene	Household Poverty Status, Community Members of Color, Renter Status, & Age 65+.
<b>Whiteaker</b>	Central Eugene	Household Poverty Status, Renter Status, & Age 65+.
<b>Churchill</b>	Southwest Eugene	Community Members of Color, Renter Status, Age 65+, & 15 to 18 Year Olds.
<b>Friendly</b>	South Eugene	15 to 18 Year Olds.
<b>Amazon</b>	Southeast Eugene	Household Poverty Status.
<b>Southwest Hills</b>	South Eugene	Age 65+.
<b>Downtown</b>	East Central Eugene	Household Poverty Status, Community Members of Color, Renter Status, Age 65+, & 15 to 18 Year Olds.
<b>Santa Clara</b>	North Eugene	Age 65+.
<b>Industrial Corridor</b>	Northwest	Community Members of Color, Renter Status, & Age 65+.
<b>Goodpasture Island</b>	North Central	Renter Status & Age 65+.
<b>Southeast</b>	Southeast	Renter Status & Age 65+.
<b>Northeast</b>	Northeast	Renter Status & Age 65+.