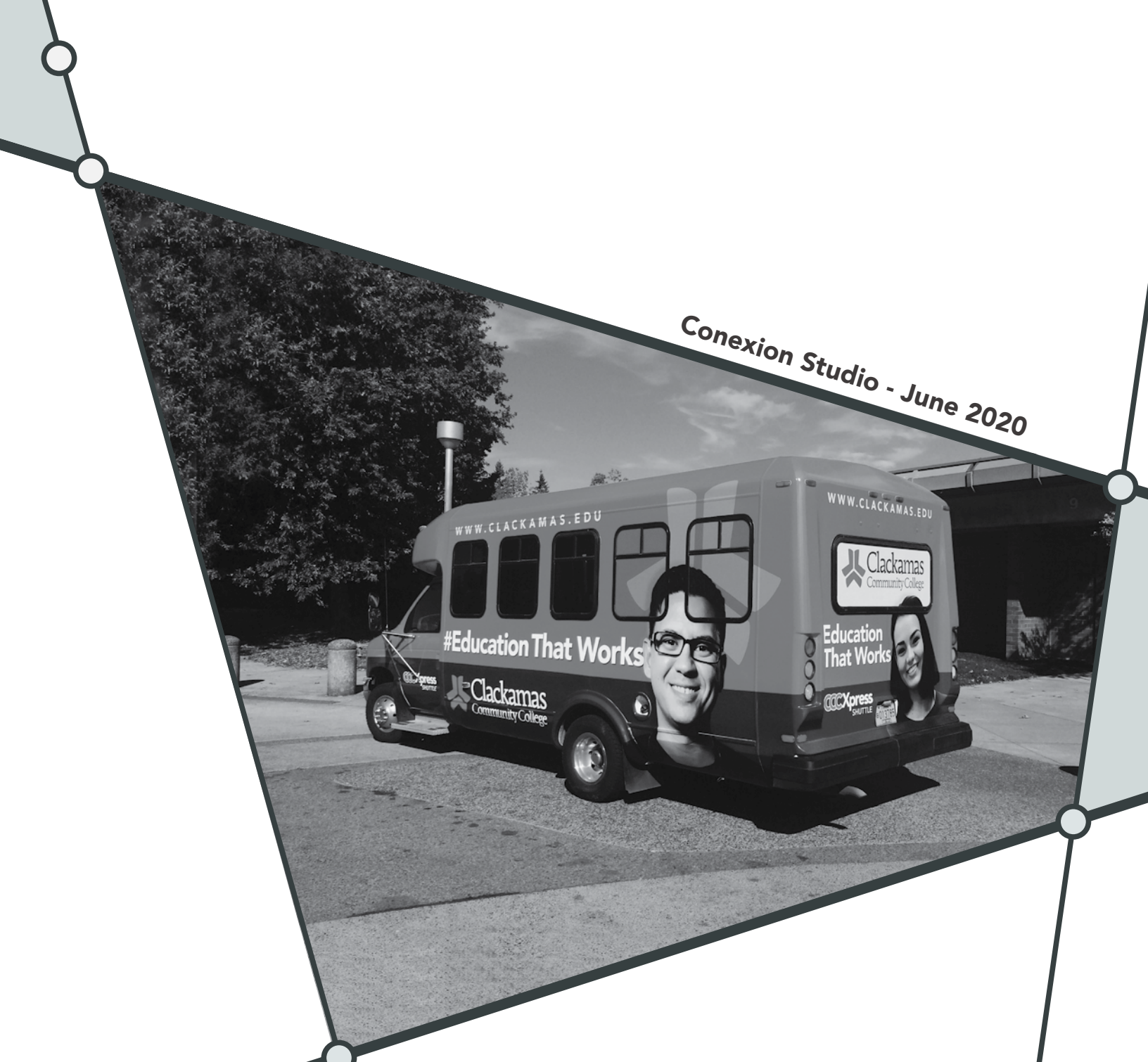

Conexion Studio - June 2020

Clackamas Community College

SHUTTLE SERVICE
and
ACCESS PLAN

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Clackamas Community College

EXECUTIVE SUMMARY

CONTEXT

Today, transportation barriers are common among Clackamas Community College (CCC) students. CCC's Spring 2019 student transportation survey found that close to 40% of students have been late or missed a class due to transportation issues. Given the history of auto-centric, piecemeal development in Clackamas County, providing an efficient and robust transit system is difficult, which means students with limited or no access to personal vehicles face compounded difficulties in accessing education at CCC. Making education more accessible is part of CCC's mission, and overcoming transportation barriers is an essential part of that work.

CCC needs the Clackamas Community College Shuttle Service and Access Plan (CCCSSAP), which identifies and prioritizes feasible projects and programs to improve student access to the Oregon City and Harmony campuses via the CCC Xpress Shuttle. Improving access to the college's campuses by shuttle will expand the pool of potential students to include those who currently have difficulty reaching campus and may also reduce transportation-related tardiness.

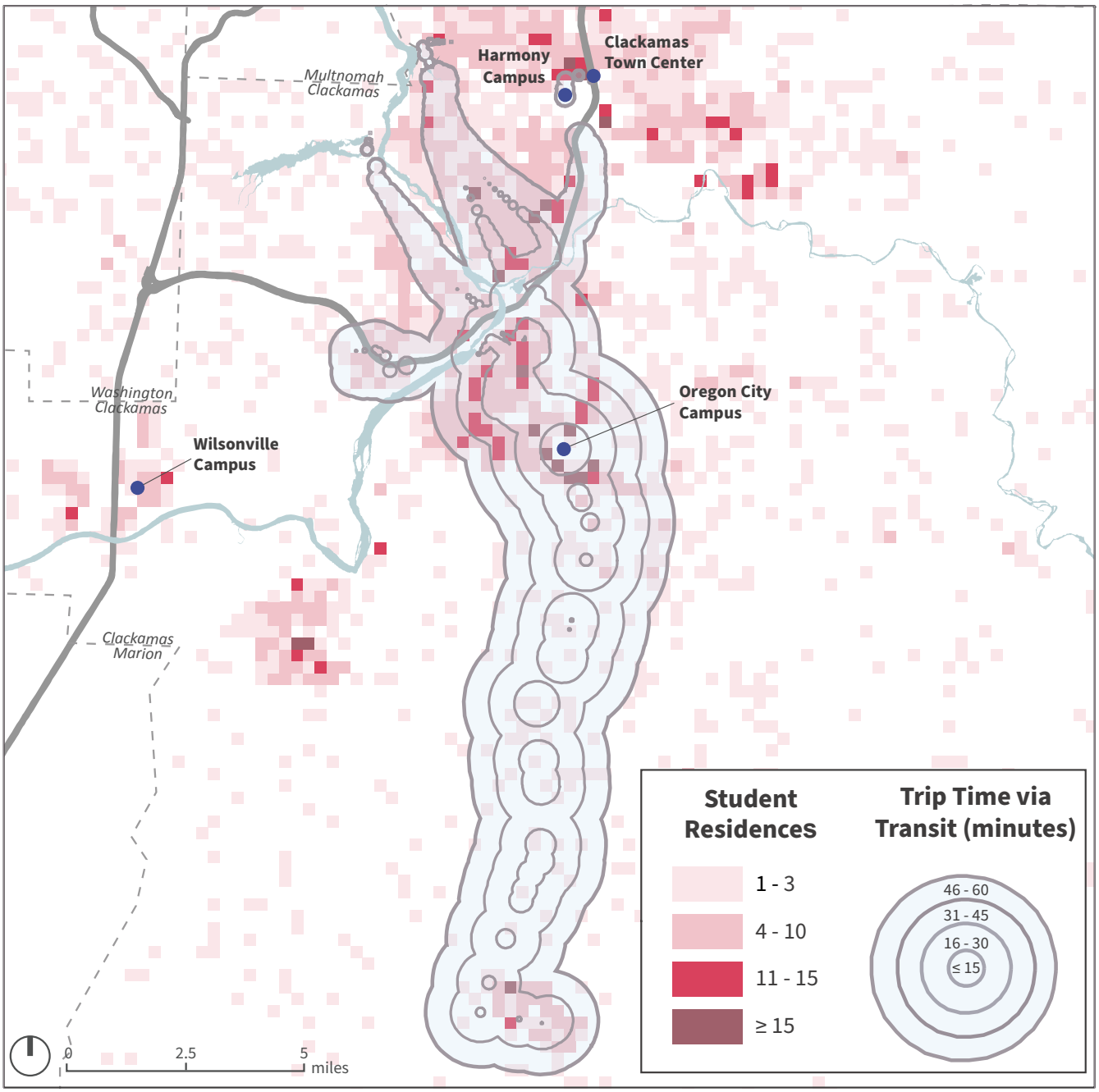
Improvements to transit and shuttle service have the potential to impact a large portion of Oregon City and Harmony students. Figure ES1 shows student residences and travel time by transit to each campus at peak class start times. The share of students from each campus that can get to school within 30 minutes is slightly higher at Oregon City than at Harmony. This is due to both the availability of transit service and the residential location of students. Beyond 30 minutes but less than

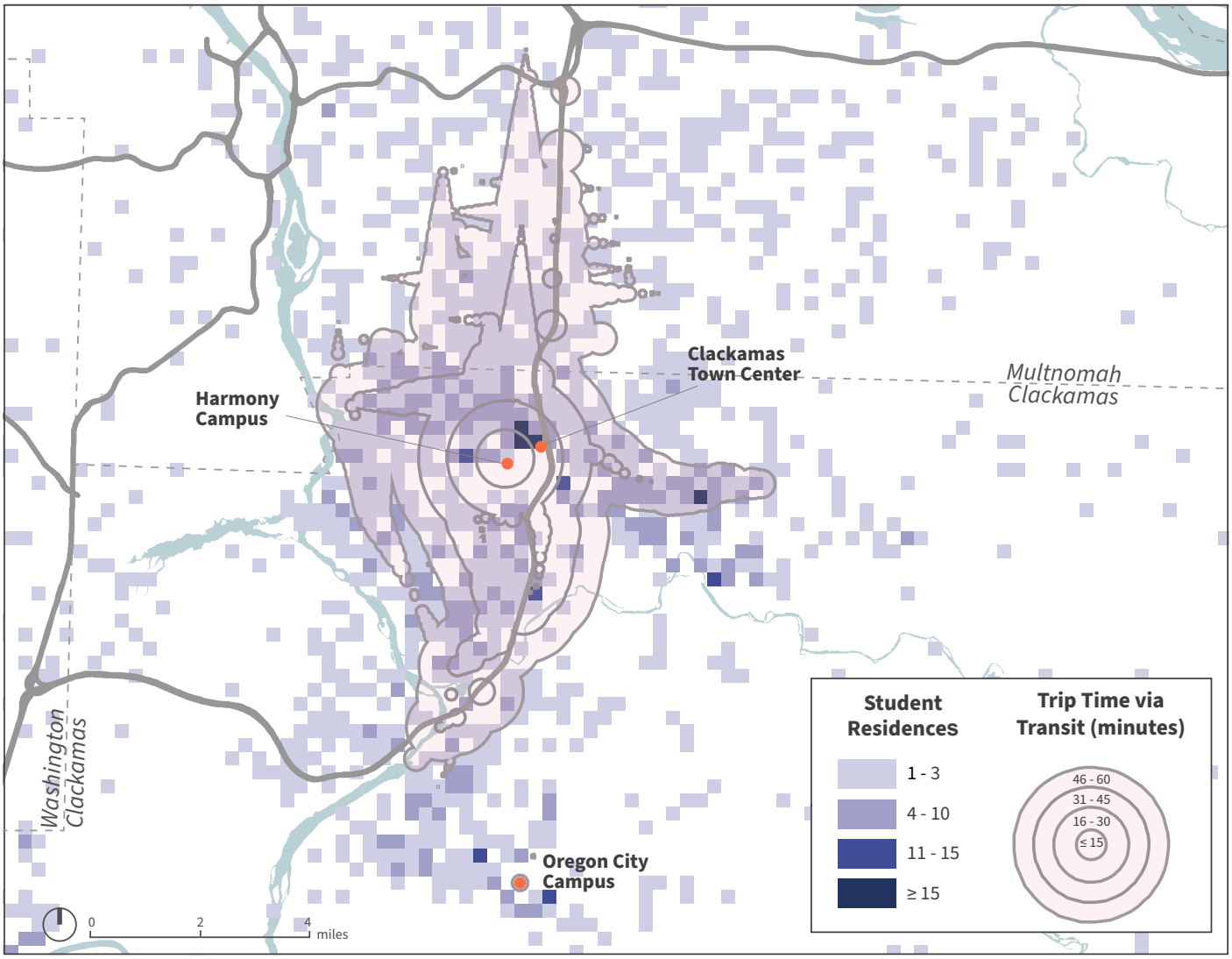
60 minutes travel time, a much higher percentage of Harmony students have access to campus via transit than Oregon City Students: 92% of Harmony students live within an hour of the campus by transit, but only 64% of Oregon City students do.

EQUITY STATEMENT

This plan sits at the intersection of access to systems of transportation and higher education. The exclusion of people of color, low-income people, and people with disabilities from both of these systems has a long and ongoing history. Transportation planners in particular have a responsibility to place concerns about equity, especially racial equity, at the forefront of any planning process due to our complicity in the destruction of communities of color via transportation projects. In the CCCSSAP, we considered equity at every phase from scope selection to implementation. The student engagement plan (see Chapter 3) directed additional focus to marginalized students, and the final recommendations (Chapter 4) are informed by this student-centered community engagement.

Figure ES1. Student residences and travel time via transit for students with at least one class at the Oregon City (left) and Harmony (right) campuses at peak class start times.




Harmony Campus
Clackamas Town Center
Multnomah
Clackamas
Washington
Clackamas
Oregon City Campus
0
2
4
miles
Student Residences
1 - 3
4 - 10
11 - 15
≥ 15
Trip Time via Transit (minutes)
46 - 60
31 - 45
16 - 30
≤ 15

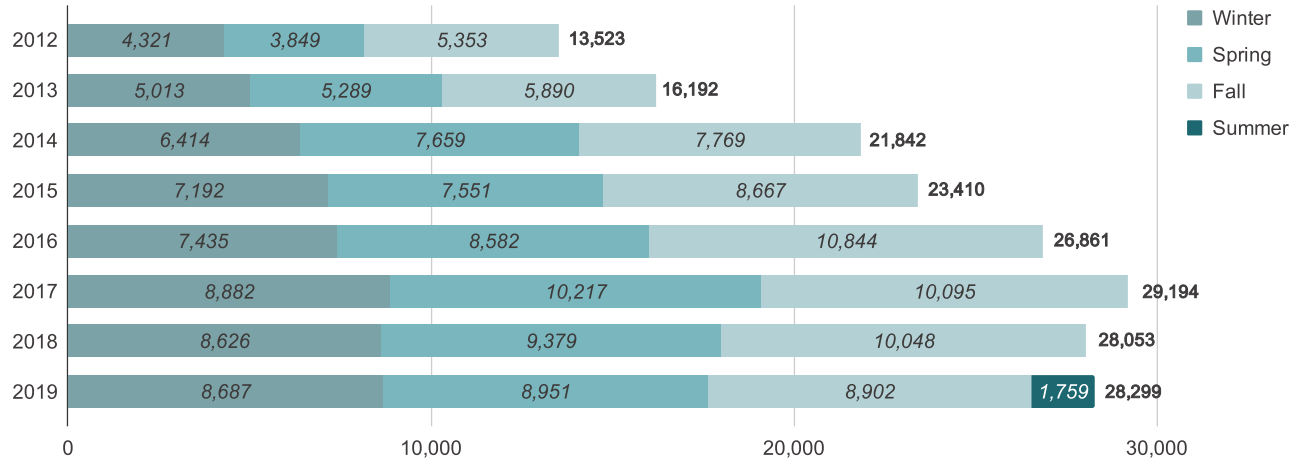
BARRIERS

The plan provides a student-centered analysis of barriers that make it difficult for students with limited access to personal vehicles to get to CCC's Oregon City and Harmony campuses. We pay special attention to the CCC Xpress Shuttle, which sees over 26,500 trips per academic year, because of the important role it plays in these students' journeys to school. In addition, the plan focuses on the compounded barriers facing this plan's priority populations: students of color, low-income students, and students with disabilities.

CCC's Xpress Shuttle is the college's most successful transportation program. Our survey found that 15% of students who only travel to Oregon City, 3.1% of students who only travel to Harmony, and 36% of students who travel to both campuses said they rode the Xpress Shuttle at least one day a week. Further key findings include:

- Students must balance cost with convenience, whether that is with respect to vehicle ownership or taking other transit services when they miss the shuttle.
- The CCC Xpress Shuttle is very important to its core riders, many of whom would not be able to attend CCC without it.
- There are areas for improvement in Xpress Shuttle service.

Figure ES2. CCC Xpress Shuttle Ridership, 2012 - 2019.



Specifically, increasing shuttle frequency would resolve many of the frustrations students expressed.

- Access to the shuttle could be improved with additional advertisement, translating shuttle information into languages other than English, improved shuttle stops, and new stops close to popular destinations.
- Students were asked about the possibility of overcoming transportation barriers with shared micromobility options such as bike- or scooter share, but there was only lukewarm interest in these options.

Because of the importance of the Xpress Shuttle to its core riders and the prevalence of students using the Shuttle at least once per week, our primary recommendations (Chapter 4) encourage investment in this service.

Student stories

To bring student voices into the final plan, we have included transportation stories from real CCC students at the beginning of each chapter. Names have been changed to protect their privacy.

• • •

Most of Aimee's classes are at the Harmony campus, and she gets to school in a number of different ways. Sometimes there's a car available at home she can borrow, but most days she'll take public transit, the shuttle, or both. After a long day of classes, with schoolwork left to complete at the end of the day, she often worries about how she'll get home:

> *At the end of the day I'm fairly exhausted from school and the material I've learned. I still have to think, 'Am I going to get home? How am I going to get home?'*

Aimee says that if CCC found a way to make the shuttle more predictable and convenient, it would help students like herself better meet the demands of school by freeing up the mental space currently occupied by transportation worries.

RECOMMENDATIONS

The central goal of the CCCSSAP is to improve access to campus by transit and the CCC Xpress Shuttle. Based on information about barriers to student access, we developed five strategies for reaching this goal.

1. **Make riding the shuttle more convenient**
   When the shuttle is more convenient, it becomes a viable option for students who are looking to reduce their travel times or costs. Recommended actions under this strategy are about reducing student travel times on the shuttle and increasing the reliability of shuttle service.

2. **Improve access to information about the shuttle**
   A recurring theme in interviews was students' limited knowledge of the Xpress Shuttle service during their first and second terms attending CCC. Recommended actions under this strategy increase awareness of the shuttle and help students understand how they might be able to use the shuttle to decrease their commute time and/or cost.

3. **Improve shuttle safety and comfort**
   While safety and comfort do not themselves reduce travel times or costs, when students feel unsafe or uncomfortable waiting for or riding the shuttle, they may no longer consider it a viable transportation option.

4. **Create supportive parking policies**
   Some of the recommended actions needed to reach the plan's overarching goal of increased access require parking enforcement. Recommendations in this section support the other recommended actions by creating space in parking lots for non-drive-alone modes and by creating a new funding source.

5. **Expand the variety of transportation options available to students for first- and last-mile connections**
   The recommended actions under this strategy support students who could access the shuttle via a mode other than walking or driving alone. The actions make bikes more readily available to students, encourage students to try out new modes to expand the range of transportation options they see as viable for themselves, and encourage students with cars to participate in carpooling. These actions can improve direct access to campuses as well as access to the shuttle.

CONCLUSION

The CCCSSAP provides a blueprint for shuttle service and access investments. Moving forward, centering the big picture is key: on the road to educational and training opportunities, students should not be hindered by transportation barriers.

Student story: “Aimee”

Most of Aimee’s classes are at the Harmony campus, and she gets to school in a number of different ways. Sometimes there’s a car available at home she can borrow, but most days she’ll take public transit, the shuttle, or both. Aimee walks to a MAX stop and rides the MAX to CTC. From there, she’ll either board the shuttle to Harmony or take a bus that gets her close to campus. Upon arriving at CTC, if Aimee doesn’t see the shuttle coming and the bus is instead ready to go, she’ll take the bus. Otherwise, she’ll take the shuttle. Her total commute to Harmony is about an hour and a half. Aimee chooses to take transit and the shuttle to get to school because they’re the most financially feasible option for her. As she already has student loans, it doesn’t make financial sense for her to also take out a loan to finance a car. Aimee prefers to take the

1 INTRODUCTION

This chapter provides basic information about Clackamas Community College, the plan's purpose and process, and its focus on equity. It also contains information about the conditions under which the plan was produced, the COVID-19 pandemic, and the effects that had on the plan.

shuttle over public transit because she feels safer in it, but on an almost daily basis, she has to balance the opportunity costs of waiting for the low-frequency shuttle or taking a more frequent bus that she doesn't feel as safe in. Sometimes the shuttle is full and she has to wait for the next one. After a long day of classes, with schoolwork left to complete at the end of the day, she often worries about how she'll get home:

> *At the end of the day I'm fairly exhausted from school and the material I've learned. I still have to think, 'Am I going to get home? How am I going to get home?'*

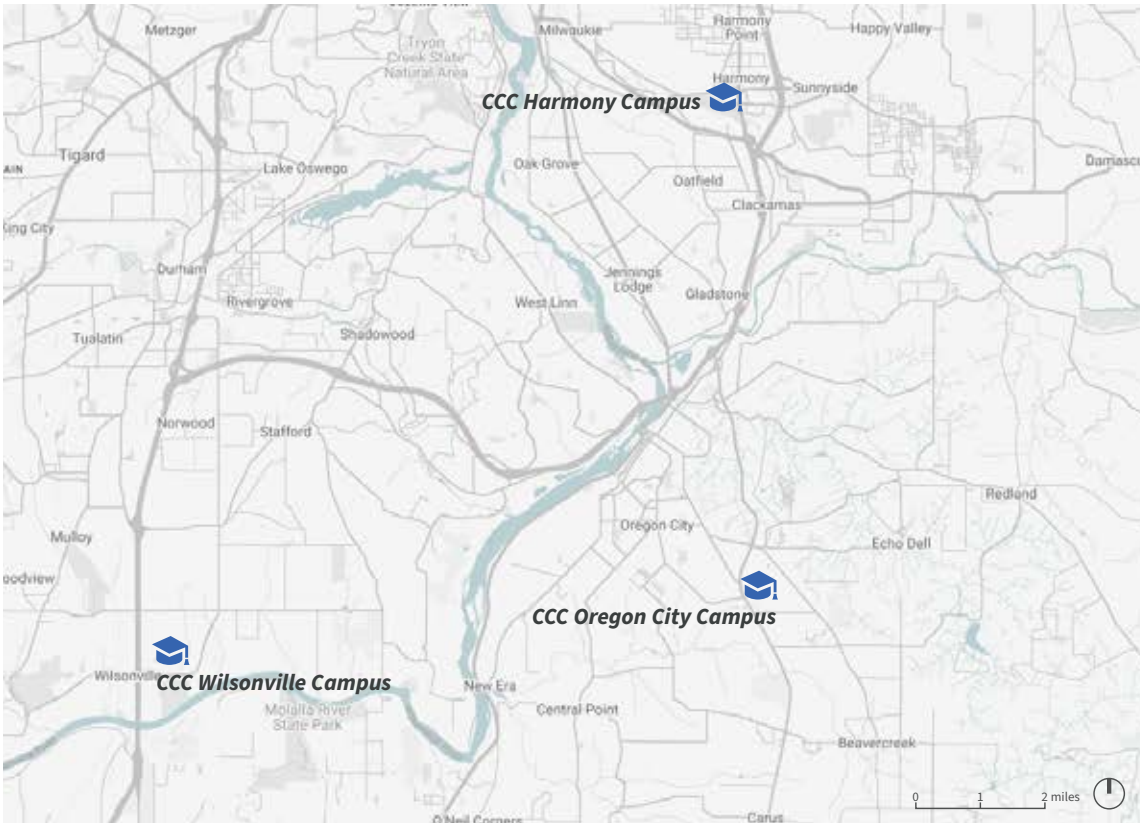
Aimee says that if CCC found a way to make the shuttle more predictable and convenient, it would help students like herself better meet the demands of school by freeing up the mental space currently occupied by transportation worries.

CLACKAMAS COMMUNITY COLLEGE

CCC serves a diverse student population with a wide range of transportation needs.

Serving nearly 25,000 students from suburban and rural areas of Clackamas County, the larger Portland Metro region, and beyond, Clackamas Community College (CCC) operates three campuses in Clackamas County and has an extended nation-wide reach via online classes. CCC aims to offer lifetime education and training opportunities that are accessible and responsive to the changing needs of the communities it serves. CCC's Oregon City location is the college's main campus, which offers the widest variety of degree programs and is home to CCC's athletic programs. CCC's Harmony campus in Milwaukie houses health education and Oregon transfer degree programs, while CCC's Wilsonville campus is home to a majority of apprenticeship and technical training courses. With course programming in career and technical degrees, college transfer credits, community education, literacy, and basic skills, CCC serves a diverse student population with a wide range of transportation needs. More information about the CCC student body can be found in Chapter 2.

Figure 1.1. Clackamas Community College campus locations.



THE PLAN

Motivation and overview

Transportation barriers are common among CCC students. CCC's Spring 2019 student transportation survey found that close to 40% of students have been late or missed a class due to transportation issues. Given the history of auto-centric, piecemeal development in Clackamas County, providing an efficient and robust transit system is difficult, which means students with limited or no access to personal vehicles face compounded difficulties in accessing education at CCC. Making education more accessible is part of CCC's mission, and overcoming transportation barriers is an essential part of that work. More information about the transportation context surrounding CCC and student transportation barriers can be found in Chapter 2 and 3.

CCC Xpress Shuttle

One important solution CCC provides is the CCC Xpress Shuttle, which connects the Oregon City and Harmony campuses with Clackamas Town Center Transit Center (CTC). The Shuttle route is shown in Figure 1.2. The Clackamas Community College Shuttle Service and Access Plan (CCCSSAP) identifies and prioritizes feasible projects and programs to improve student access to the Oregon City and Harmony campuses via CTC and the CCC Xpress Shuttle. The Wilsonville campus is not included in this plan (see *Focus on equity* below).

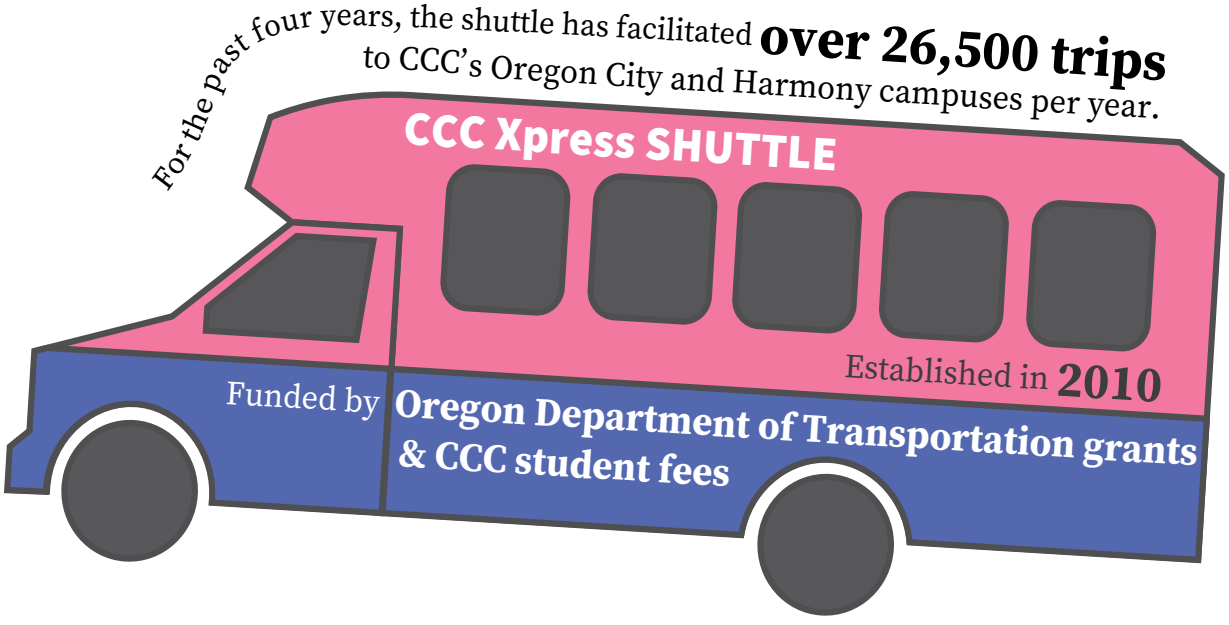
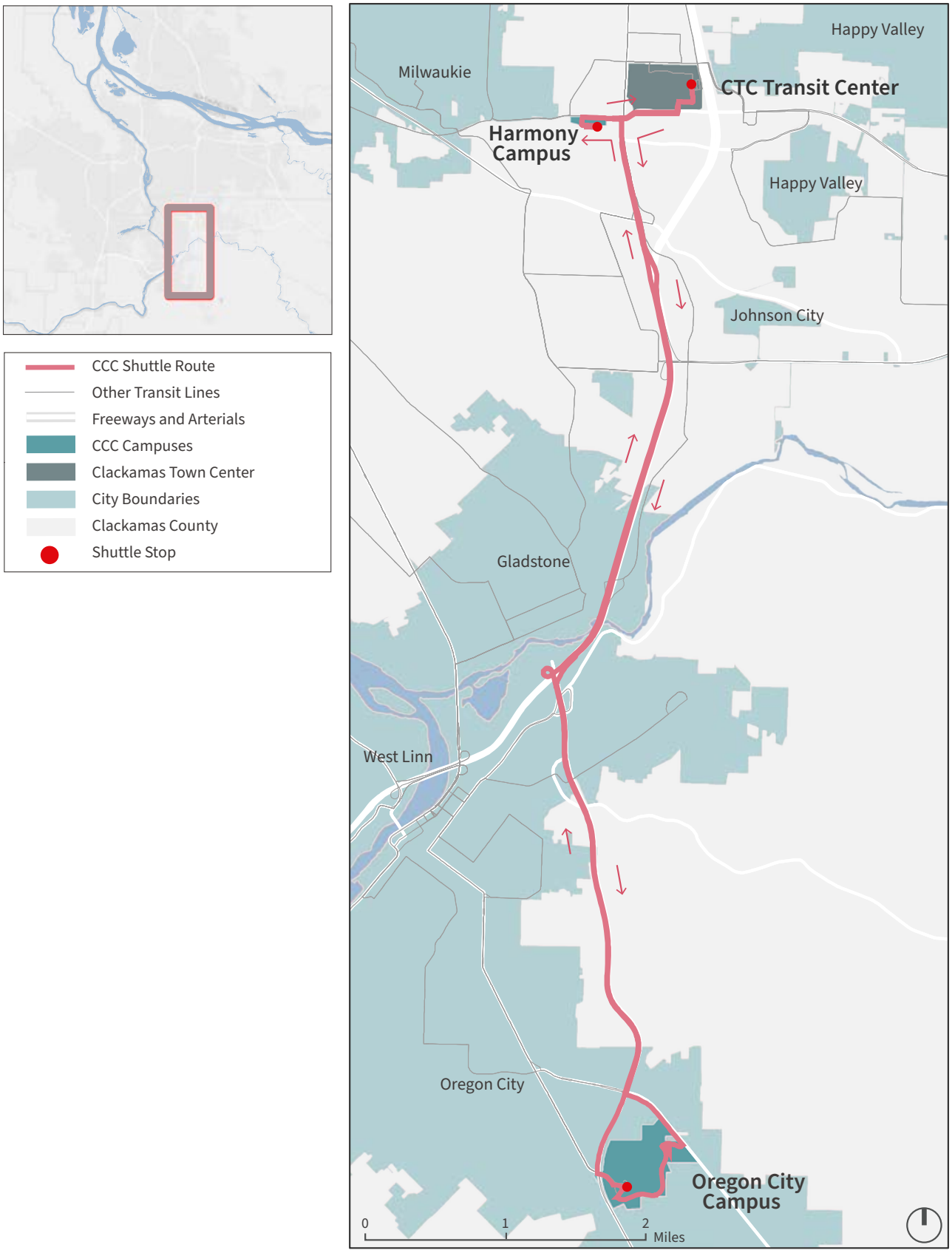


Figure 1.2. CCC Xpress Shuttle Route.



The plan provides a student-centered analysis of barriers that make it difficult to get to CCC's Oregon City and Harmony campuses for students with limited access to personal vehicles. We pay special attention to the CCC Xpress Shuttle because of the important role it plays in these students' journeys to school. In addition, we focus on the compounded barriers facing this plan's priority populations: students of color, low-income students, and students with disabilities.

We expect that improving access to campus via transit and the Xpress Shuttle could have the following positive effects:

- **Expand the pool of potential students.** This is a priority for CCC both because it is in line with the College's mission to expand access to education and because it could increase student enrollment.
- **Reduce transportation-related tardiness and absenteeism.** If students have more options for how they travel to campus, they may be less likely to miss class due to transportation issues. If transit service is more reliable, they are less likely to be late.
- **Reduce the cost- and time-burden of transportation.** When students are less stressed about the costs of their journey to school, they have more energy to focus on their studies.
- **Encourage sustainable transportation choices.** CCC is required, as a recipient of a Metro Regional Travel Options Core Partner grant and Oregon DEQ's Employee Commute Options program, to encourage all those who travel to campus to use more sustainable modes. Making one such mode more convenient and affordable increases its competitiveness against single-occupant automobile trips.

The intended audience of the plan is CCC's Transportation Systems Analyst, CCC leadership, and their transportation partners.

Defining access

In transportation planning, "access" is typically used to refer to the simple ability to get to a desired destination by a particular mode. It is a relatively low standard for a transportation system to meet. Here we are concerned with equitable access, which includes considerations of more than simple physical access, but also affordability, convenience, and time. Because the ultimate goal is to expand access

Here we are concerned with equitable access, which includes considerations of more than simple physical access, but also affordability, convenience, and time.

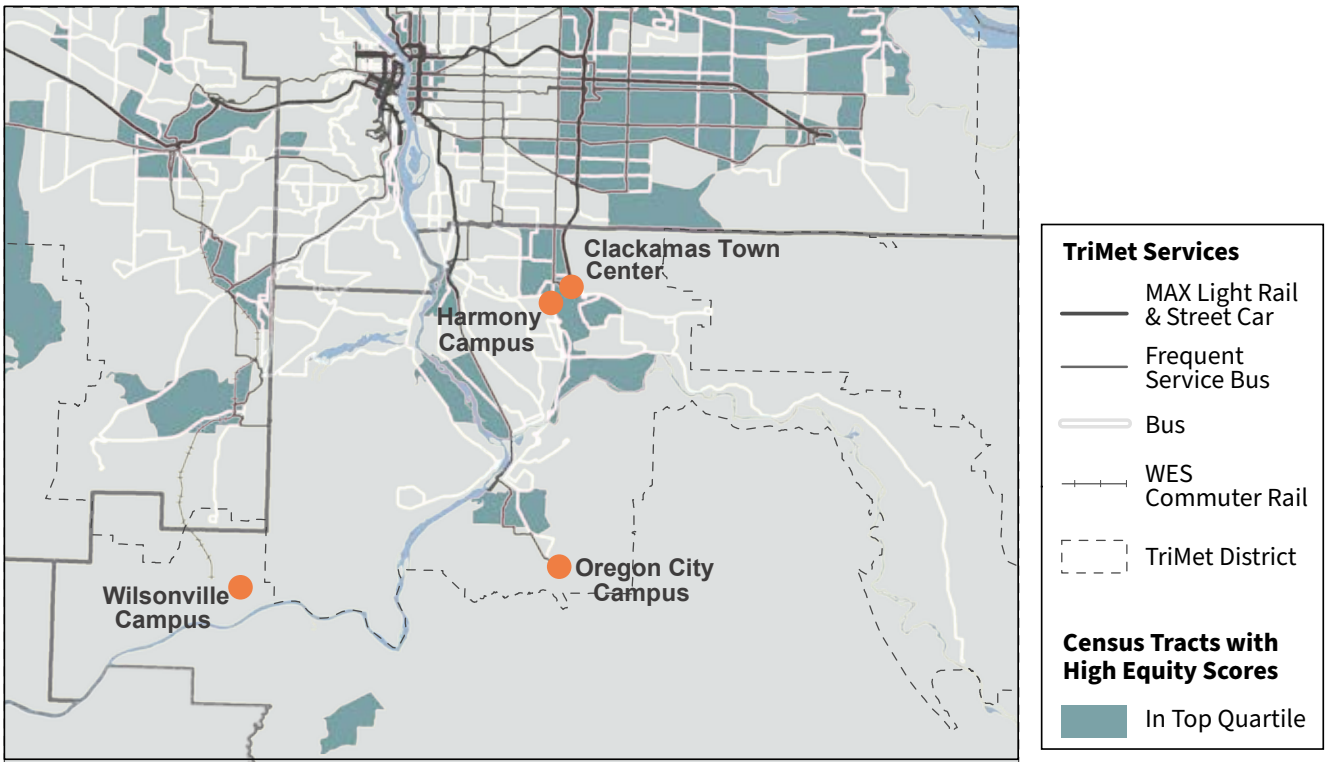
to education, we must consider the impact of longer travel times, complicated trip planning, and cost on whether a student is able to attend and be successful at CCC.

Focus on equity

This plan sits at the intersection of access to systems of transportation and higher education. The exclusion of people of color, low-income people, and people with disabilities from both of these systems has a long and ongoing history. Transportation planners in particular have a responsibility to place concerns about equity, especially racial equity, at the forefront of any planning process due to our complicity in the destruction of communities of color via transportation projects. In this plan, we considered equity at every phase from scope selection to implementation.

During scope selection, we decided to focus on the CCC Xpress Shuttle and first- and last-mile access to its current stops. This decision was based on a review of the demographics surrounding each campus. As shown in Figure 1.3, there are block groups near CCC's Oregon City and Harmony campuses that score high on TriMet's equity index, which combines ten factors including the shares of

Figure 1.3. Map of Census block groups with high scores on TriMet's Equity Index near CCC campuses.



the population who are people of color, people with disabilities, and low-income people.[1] None of the block groups near the Wilsonville campus score in the top 25% region-wide. Because of this and the shuttle's current route, which does not include Wilsonville, we focused on improving access to the Oregon City and Harmony campuses.

The student engagement plan (see Chapter 3 and Appendix B) directed additional focus to marginalized students, and the final recommendations (Chapter 4) are informed by this student-centered community engagement. In Chapter 5, we provide some guidance for how CCC can bring this focus forward into future decision-making.

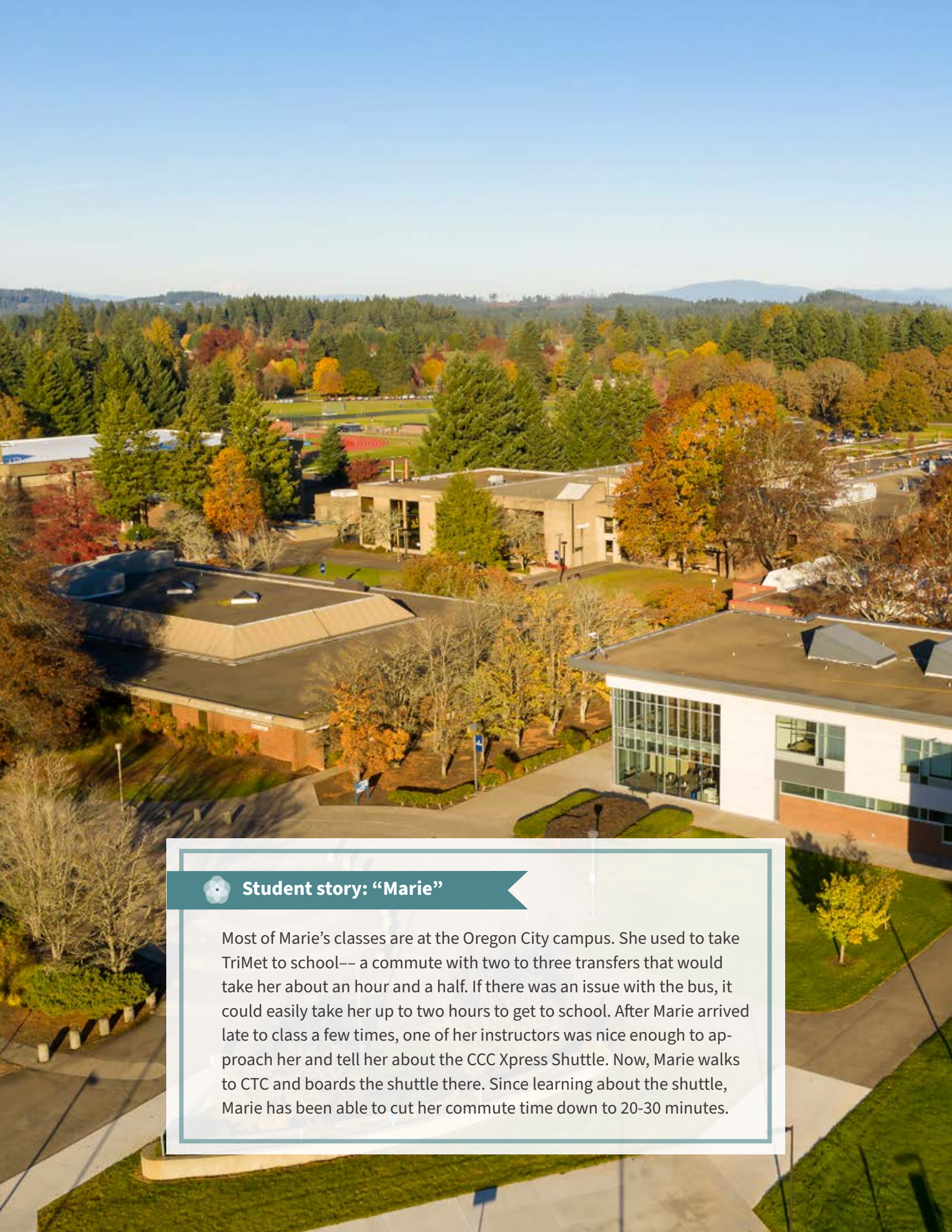
Process overview

Conexion Studio created this plan in coordination with CCC from January to May, 2020. We researched the planning context, including existing plans and concurrent planning processes, and analyzed CCC student demographic profiles and U.S. Census data. The bulk of the planning process was focused on student engagement, and then we developed recommendations based on the results of that engagement.

The bulk of the planning process was focused on student engagement.

Midway through the planning process, the COVID-19 pandemic required substantial changes to the student engagement plan when Oregon Governor Kate Brown issued Executive Order 20-12: Stay Homes, Save Lives.[2] All schools in Oregon moved to remote learning platforms for the remainder of the 2019-2020 academic year. CCC started Spring Term 2020 one week late and saw a 33% reduction in Spring Term enrollment compared to 2019. In response, we shifted student engagement online, relying on an online survey and virtual one-on-one student interviews. We were unable to fill some of the gaps left by this shift, namely the loss of input from students with limited internet access at home. However, we continued to focus the most time-intensive engagement method, interviews, on priority populations.

While we cannot fully predict the outcomes of the disruption this pandemic has caused, we know that disasters have disparate impacts on historically marginalized communities and that public transportation providers are ill-prepared and under-funded. We realize that CCC will likely face substantial challenges in the coming months, and we hope that this plan provides a foundation for the difficult decisions that will need to be made to ensure that transportation to CCC continues to become more equitable and accessible.



Student story: “Marie”

Most of Marie’s classes are at the Oregon City campus. She used to take TriMet to school–– a commute with two to three transfers that would take her about an hour and a half. If there was an issue with the bus, it could easily take her up to two hours to get to school. After Marie arrived late to class a few times, one of her instructors was nice enough to approach her and tell her about the CCC Xpress Shuttle. Now, Marie walks to CTC and boards the shuttle there. Since learning about the shuttle, Marie has been able to cut her commute time down to 20-30 minutes.

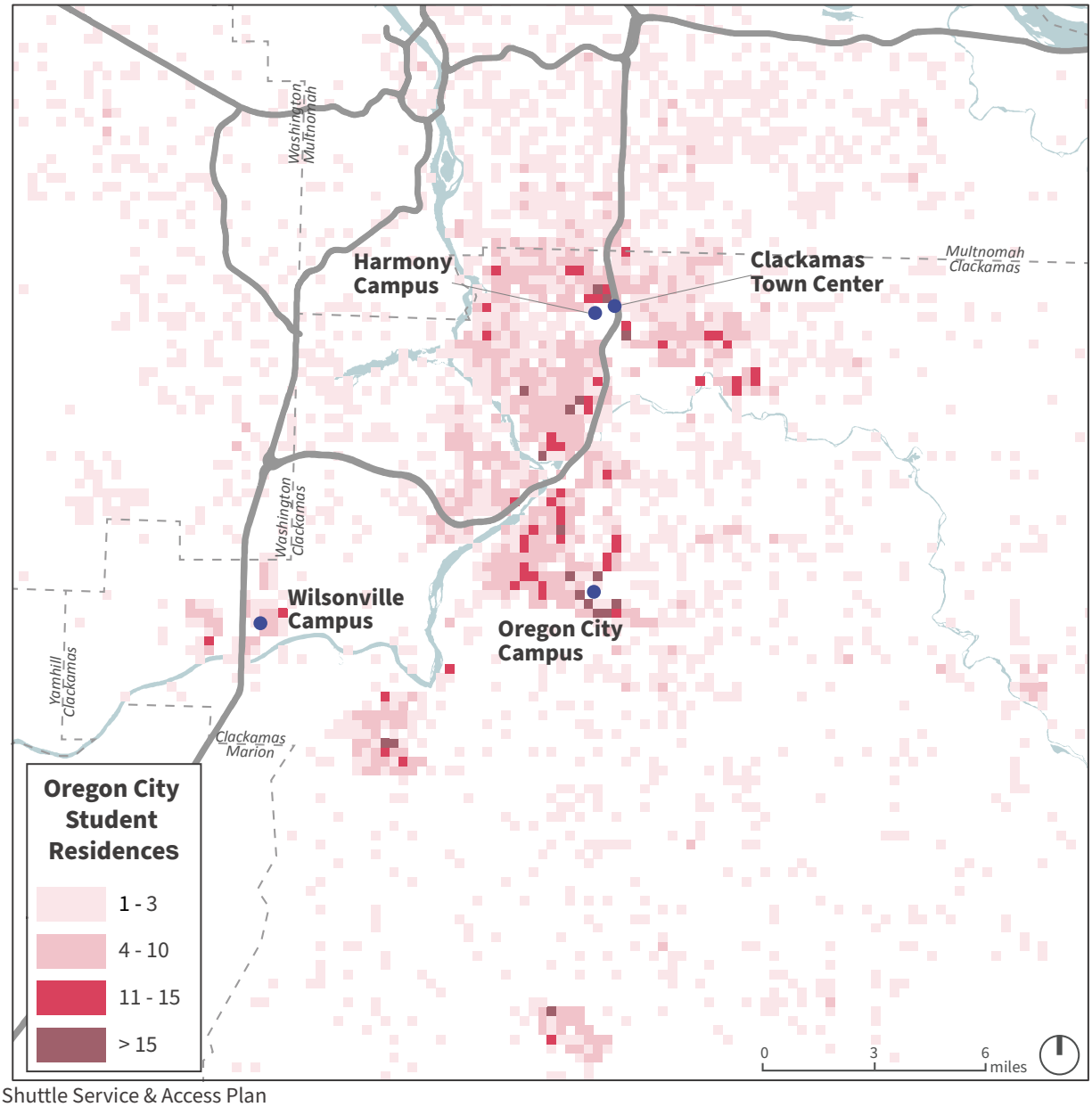
2 CONTEXT

This chapter describes the context for the Clackamas Community College Shuttle Service and Access Plan. In the first section, we describe the student body and consider the potential future students who could benefit from expanded transit access to CCC. We then analyze some of the challenges of providing excellent transit service in a suburban environment, the gaps CCC is tasked with filling for its students. In the following section, we list the city-level plans the CCCSSAP is aligned with. The final section provides more information about current programs, services, and planning at CCC, including transportation programs and the Diversity, Equity, and Inclusion Strategic Plan.

STUDENTS AND POTENTIAL STUDENTS

Student needs drove both the process and the recommendations of this plan, and they should continue to drive decision-making about future transportation investments. Here we ask which students are affected by decisions about transit. First we describe the student population, then look at the share of students who could easily take public transit to campus, and finally consider the potential students (area residents) who could also benefit from expanded transit access to the Oregon City and Harmony campuses.

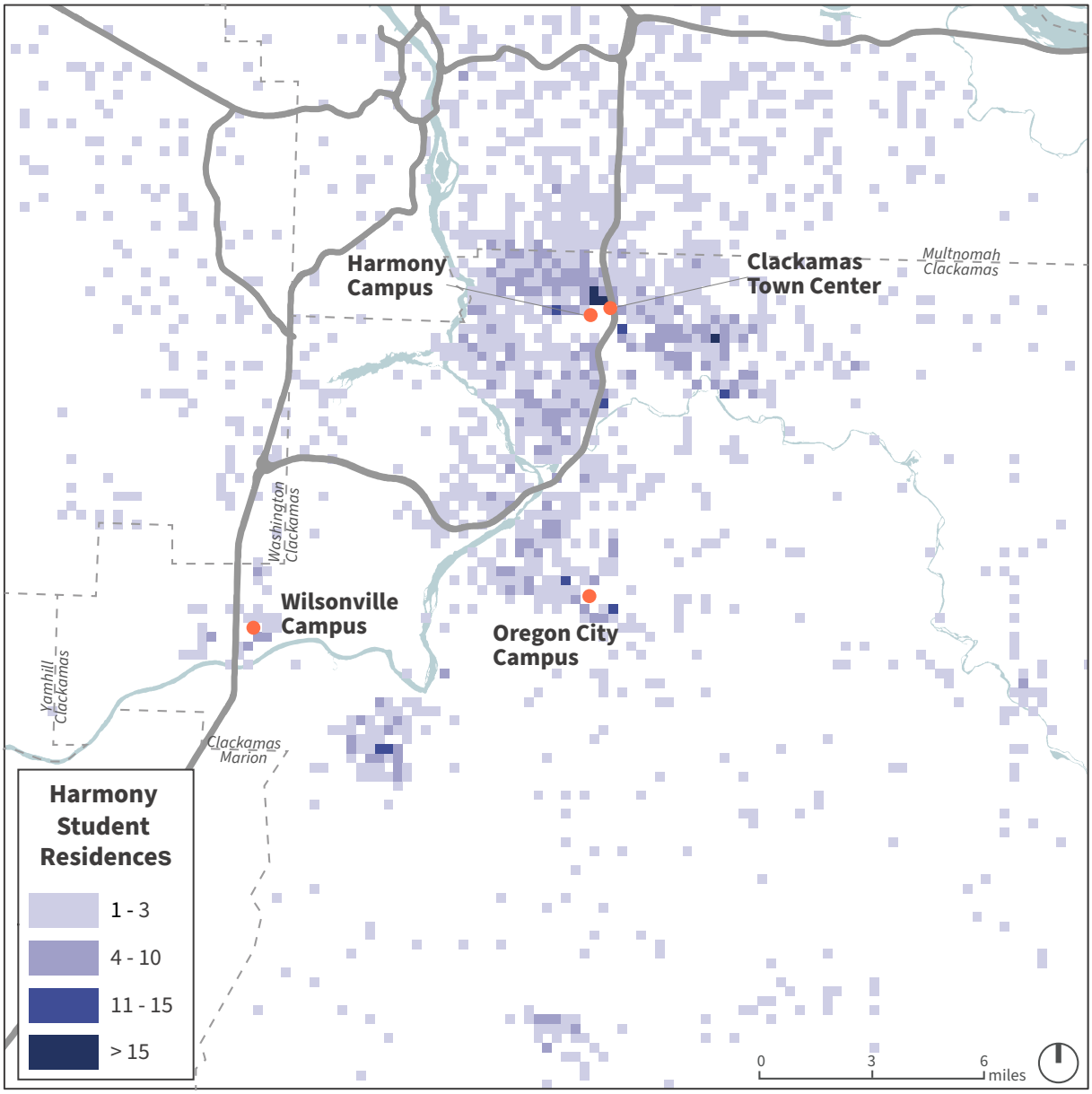
Figure 2.1. Residential locations for students with at least one class at the Oregon City campus.



Student Profile

Of the 7,782 students registered during Winter Term 2020, 5,105 had at least one class at the Oregon City campus, and 1,720 had at least one class at the Harmony Campus. Since each campus offers different course programming, 715 students took classes at both the Oregon City campus and the Harmony campus. These students live in Clackamas, Multnomah, and Washington counties, as shown in Figures 2.1 and 2.2. These figures also show 7,115 former students who were no longer registered during Winter Term 2020. We have included the Wilsonville campus location for reference, but Wilsonville students were not included in this plan.

Figure 2.2. Residential locations for students with at least one class at the Harmony campus.

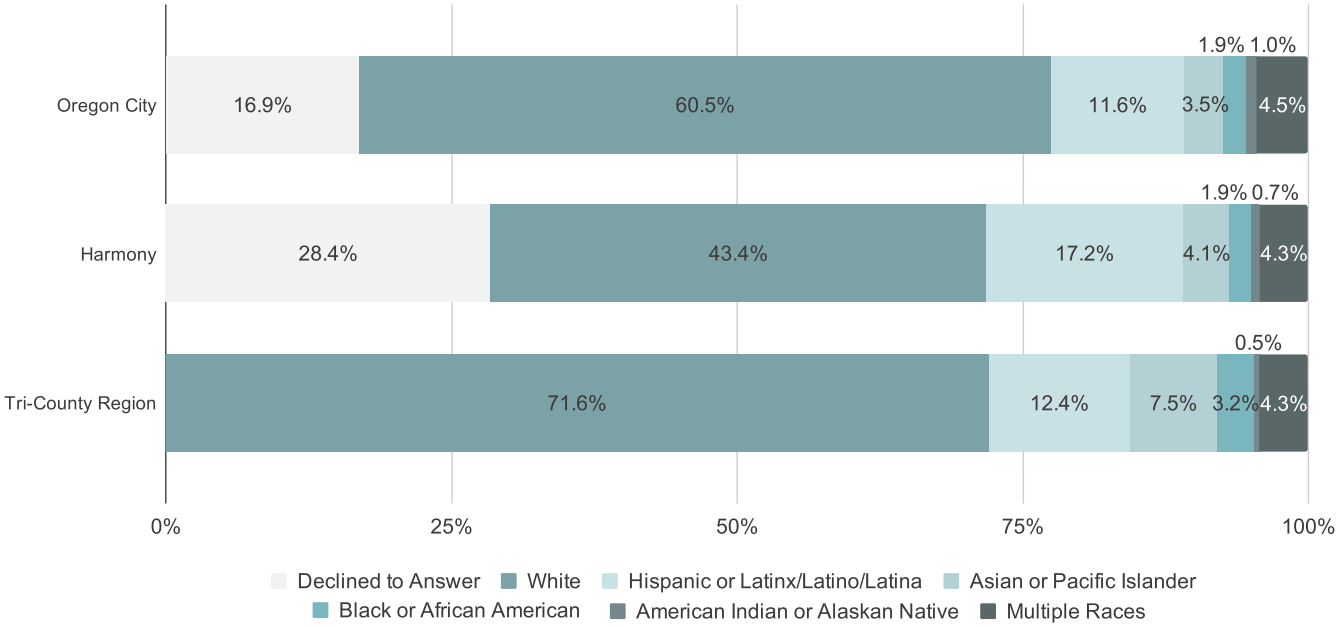


As of 2018, the most recent year for which data was readily available, the majority of students at these two campuses are white, but the white student population is significantly larger at the Oregon City campus. Hispanic or Latinx/Latino/Latina-identified students comprise the second most populous group of CCC students by race or ethnicity and make up a share percent of the student body at the Harmony campus. While the population of Latinx/Latino/Latina students at CCC is high relative to the surrounding area, most racial groups are represented in the student body at about the same rate they are in Clackamas, Multnomah, and Washington counties combined. Comparisons between the demographics of the CCC student body and the tri-county area are inexact because 17% of Oregon City students and 28% of Harmony students declined to answer when asked about their race. Even with this gap in information, the Harmony campus has a greater share of students of color than the tri-county region overall. The Oregon City campus has a greater share of students of color than Clackamas County alone, roughly equal to the shares in Multnomah and Washington counties (Figure 2.3).

While there are marginally more male students at CCC's Oregon City campus, over 62% of students at the Harmony campus are female (Figure 2.4).[3]

At both campuses, many students are between 18 and 29 years old, but a significant portion of the student population, 46% at the Harmony campus and at 42% at the Oregon City campus, is over 30 years old (Figure 2.5). A larger share of students at Harmony are in their 30s through 50s, and almost 5% of students at Oregon City are 65 or older.

Figure 2.3. Race and ethnicity at Oregon City and Harmony campuses compared to Clackamas, Multnomah, and Washington Counties.



Sources: CCC Institutional Research and ACS 2018 5-year estimates.

Figure 2.4. Student legal sex at Oregon City and Harmony Campuses (2018).

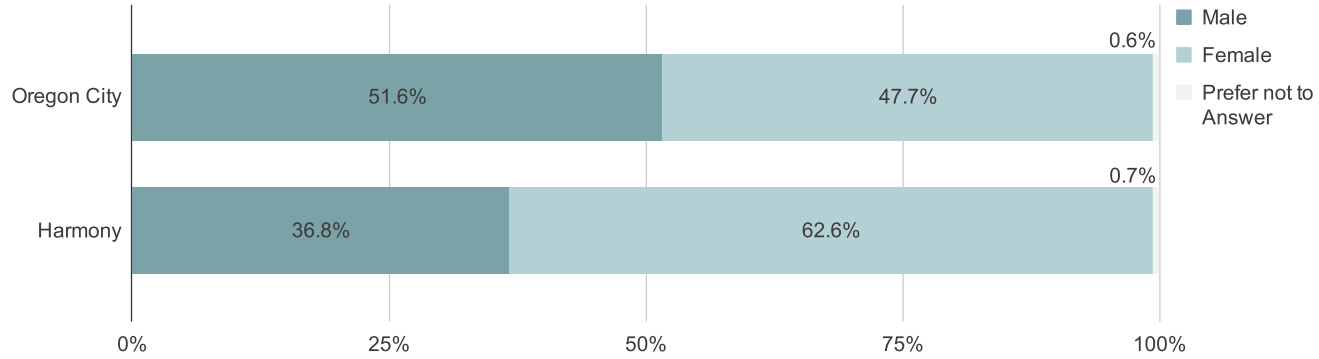
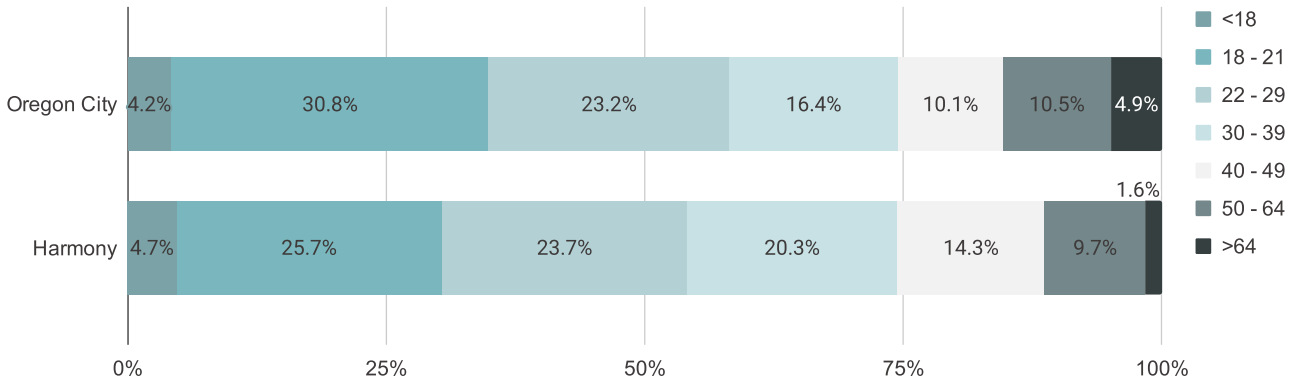
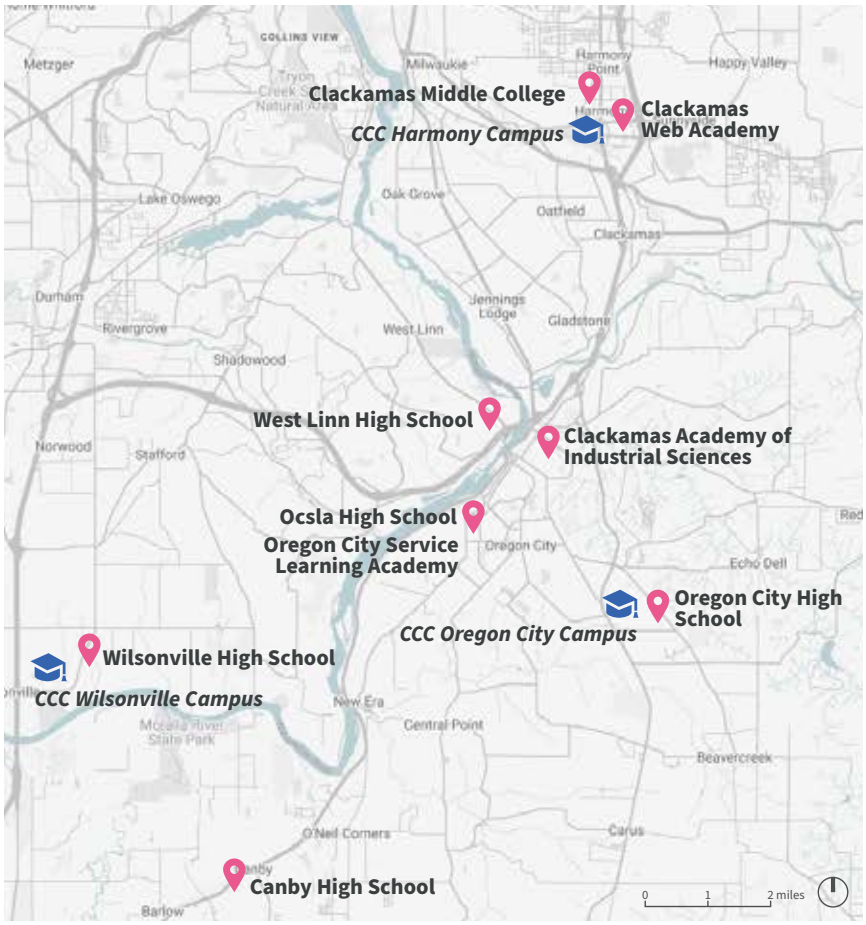


Figure 2.5. Student age at Oregon City and Harmony Campuses (2018).



Students at eight local high schools can take classes at CCC (Figure 2.6). Clackamas Middle College and Clackamas Web Academy are loated near CCC's Harmony Campus, and students there can use the CCC Xpress Shuttle to get to the Oregon City Campus. Oregon City Service Learning Academy provides its own shuttle service for students. Students at the remaining high schools do not have any form of shuttle access, and most students drive themselves.

Figure 2.6. Map of high schools and CCC campuses.



Students impacted by transit access improvements

To evaluate current access to CCC campuses via transit, we determined the share of students who can access CCC campuses via transit within 15, 30, 45, and 60 minutes. Figures 2.7 and 2.8 show residential locations and transit travel times to campus at each campus's peak class start time. The methodology for this analysis can be found in Appendix A, and further discussion of travel-time maps and the gaps that they reveal can be found in Chapter 5.

Figure 2.7. Residential location of CCC Students with at least one class at the Oregon City campus and travel time to the Oregon City Campus via transit at 7 AM.

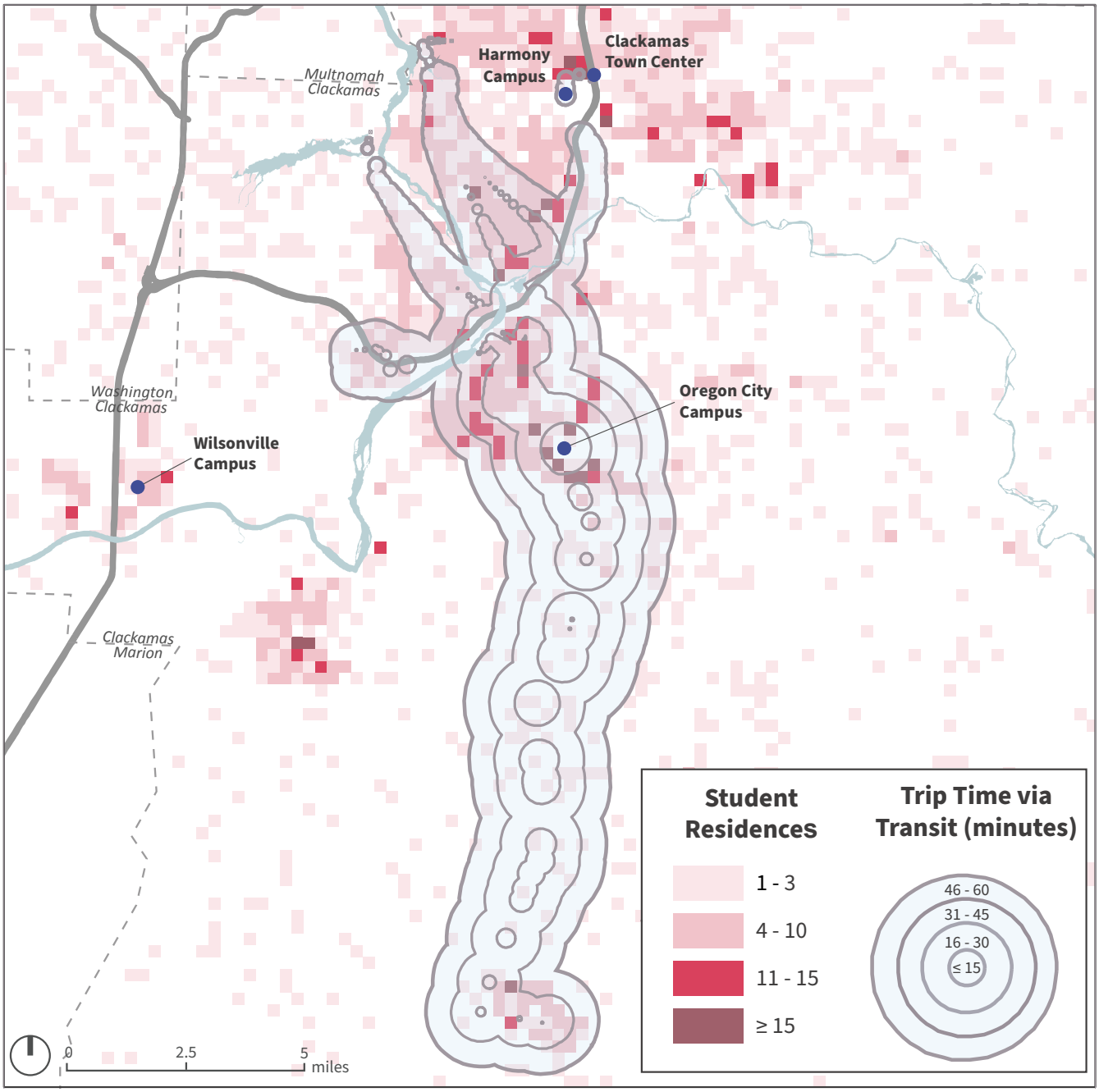


Figure 2.8. Residential location of CCC Students with at least one class at the Harmony Campus and travel time to the Harmony Campus via transit at 6 PM.

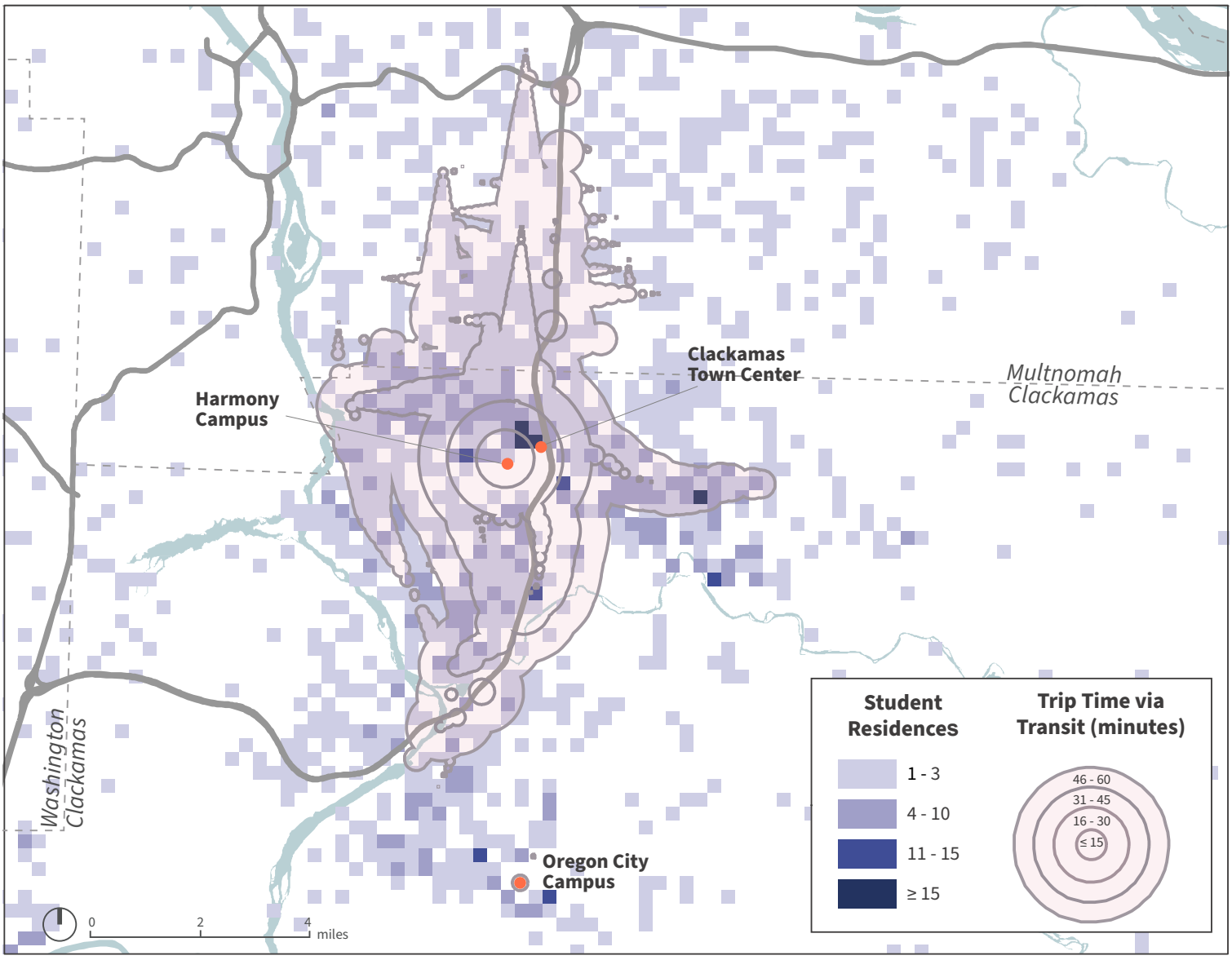
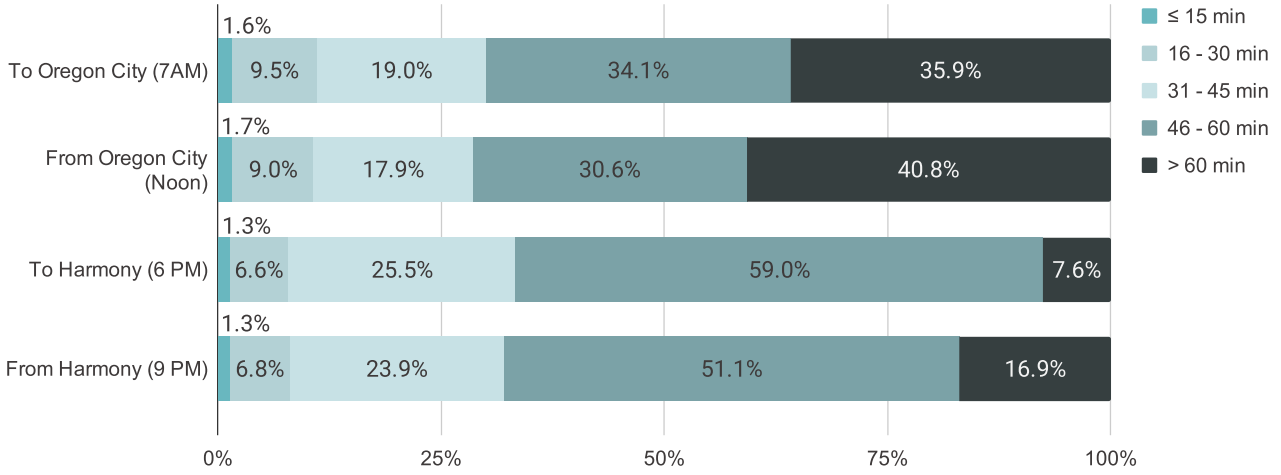


Figure 2.9 summarizes the share of students living within each of these transit travel time brackets. The percentage of students who can reach campus within 30 minutes is slightly higher at Oregon City than at Harmony. This is due to both the availability of transit service and the pattern of student residences. Beyond 30 minutes but less than 60 minutes of travel time, a much higher percentage of Harmony students have access to campus via transit than Oregon City students. At both campuses, the time it would take to return home after classes at peak times is longer than the to-campus travel time for most students.

Figure 2.9. Share of CCC Oregon City or Harmony Campus Students who live within a range of transit travel time brackets at peak class start- and end-times.

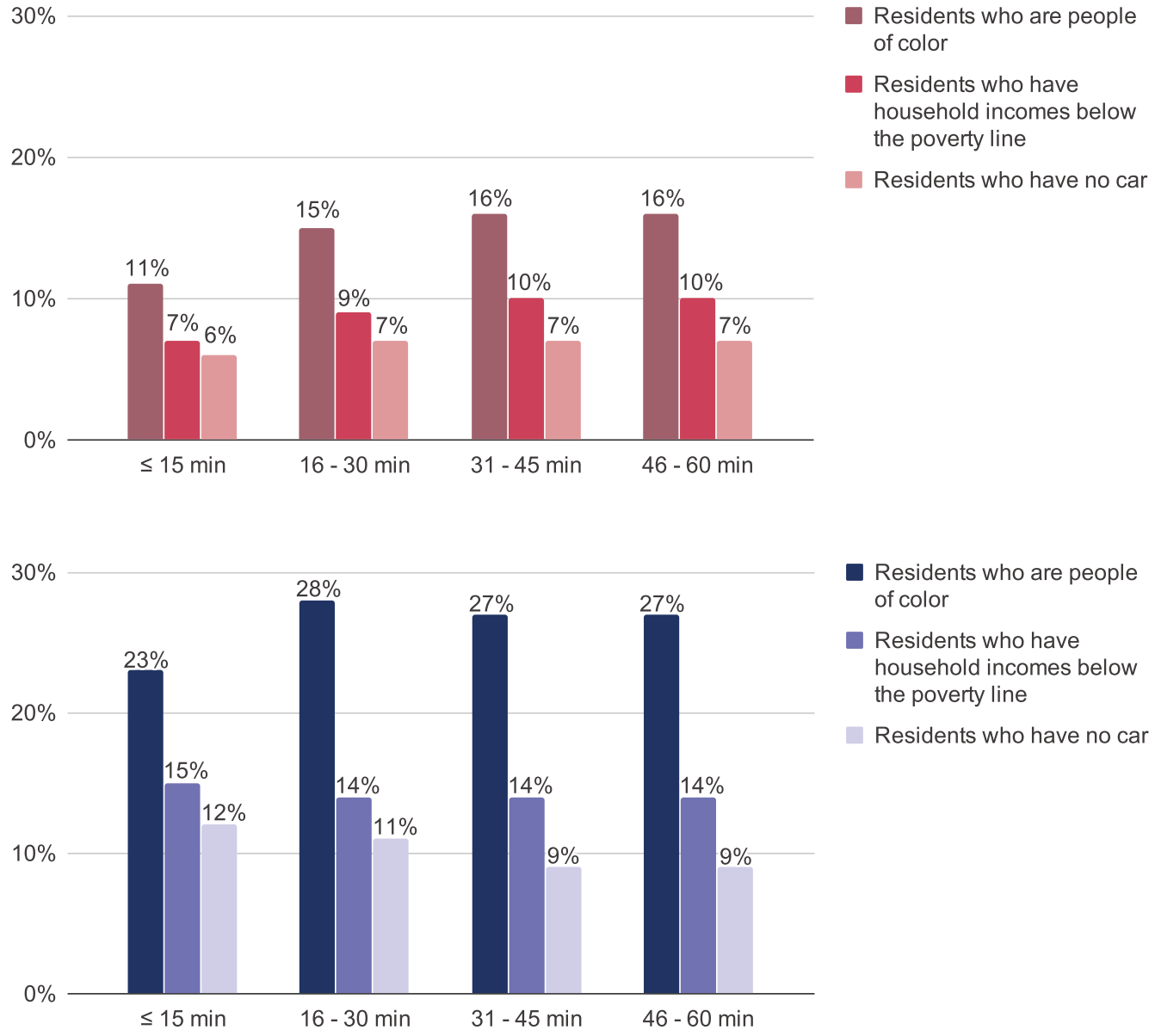


Potential students

While current students were the focus of engagement for the plan, improving access to campus via transit for them may improve access for potential students as well. Figure 2.10 shows the share of residents within each transit travel time block who are people of color, have household incomes below the federal poverty line, or live in zero-car households. In Clackamas, Multnomah, and Washington counties combined, 28.4% of residents are people of color, 11.8% have poverty-level incomes, and 8.8% live in zero-car households. Transit access to Harmony is much better than transit access to Oregon City for these groups. The share of the population within a 60-minute transit trip of Harmony with household incomes lower

than the federal poverty line, for example, is higher than the share region-wide. Improving the transit connection between these two campuses could potentially expand access to the Oregon City campus for priority populations. This is important because the Oregon City campus hosts the widest selection of courses among CCC campuses.

Figure 2.10. Share of residents who are people of color, have household incomes below the poverty line, or have no car within a range of transit travel times to CCC's Oregon City Campus at the peak class start time (top) and Harmony Campus at the peak class start time (bottom).



Source: 2017 American Community Survey via Remix.

TRANSPORTATION CONTEXT

For students and potential students without access to a vehicle, the auto-centric transportation system and suburban development pattern near campus makes getting to school tricky, time consuming, or dangerous.

CCC students live across the Portland metro area, but no matter where they live, they have to contend with the transportation context near CCC campuses. The CCC campuses are in suburban areas with suburban transportation difficulties that make driving the most convenient way to get to campus. For students and potential students without access to a vehicle, the auto-centric transportation system and suburban development pattern near campus makes getting to school tricky, time consuming, or dangerous.

Urban form and travel behavior

Research on how urban form influences travel behavior is widespread in planning. Cervero and Kockelman (1997) broadly categorize the elements of urban form that influence travel into the "three D's" of the built environment: density, design, and diversity (of land use). All three encourage walking and transit use and are negatively correlated with vehicle miles traveled (VMT).[4]

Density is the number of people living per unit of land area. Clackamas County, where Clackamas Town Center Transit Center, the CCC Oregon City campus, and the CCC Harmony campus are located, has the lowest population density of counties in the Portland metro area. The county is home to 65.6% of Harmony and Oregon City campus students. Multnomah and Washington Counties are much more dense and are home to 11% and 14.5% of CCC Oregon City and Harmony campus students respectively (Figure 2.11).

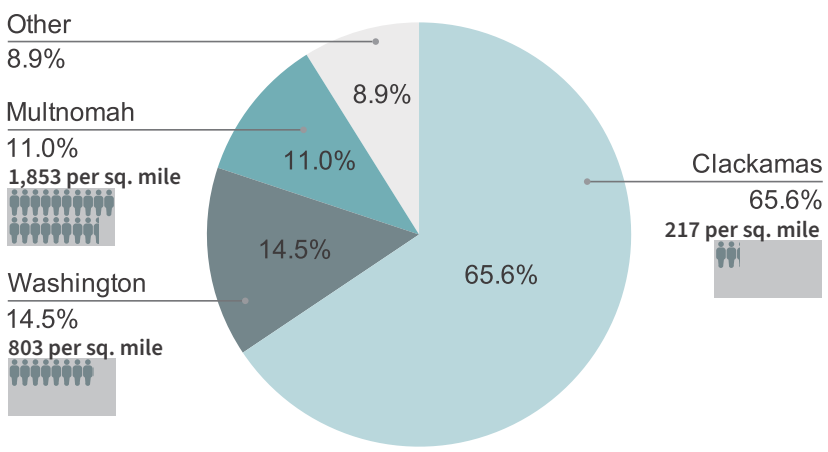


Figure 2.11. Population density of counties where CCC students reside.

Sources: CCC and 2017 American Community Survey.

In low-density residential neighborhoods, where most housing is single-family homes on lots with private yards, people live far apart from each other and from jobs, schools, grocery stores, and other essential locations. When distances to frequent destinations are large, most people will need to use motorized modes of transportation, but because low population density makes a robust public transit infeasible, a personal vehicle is often the most practical mode.

The **design** "D" refers to the design of the street network itself. The areas around both campuses in this plan and the Clackamas Town Center Transit Center are auto-centric, with large block sizes, wide arterial streets, and high vehicle traffic speeds and volumes.[5]

Figure 2.12. Street networks - *Clackamas Town Center and Harmony Campus area (upper left), Oregon City Campus and surrounding area (upper right), typical Happy Valley residential neighborhood (lower left), and typical medium-density Portland neighborhood (lower right).*

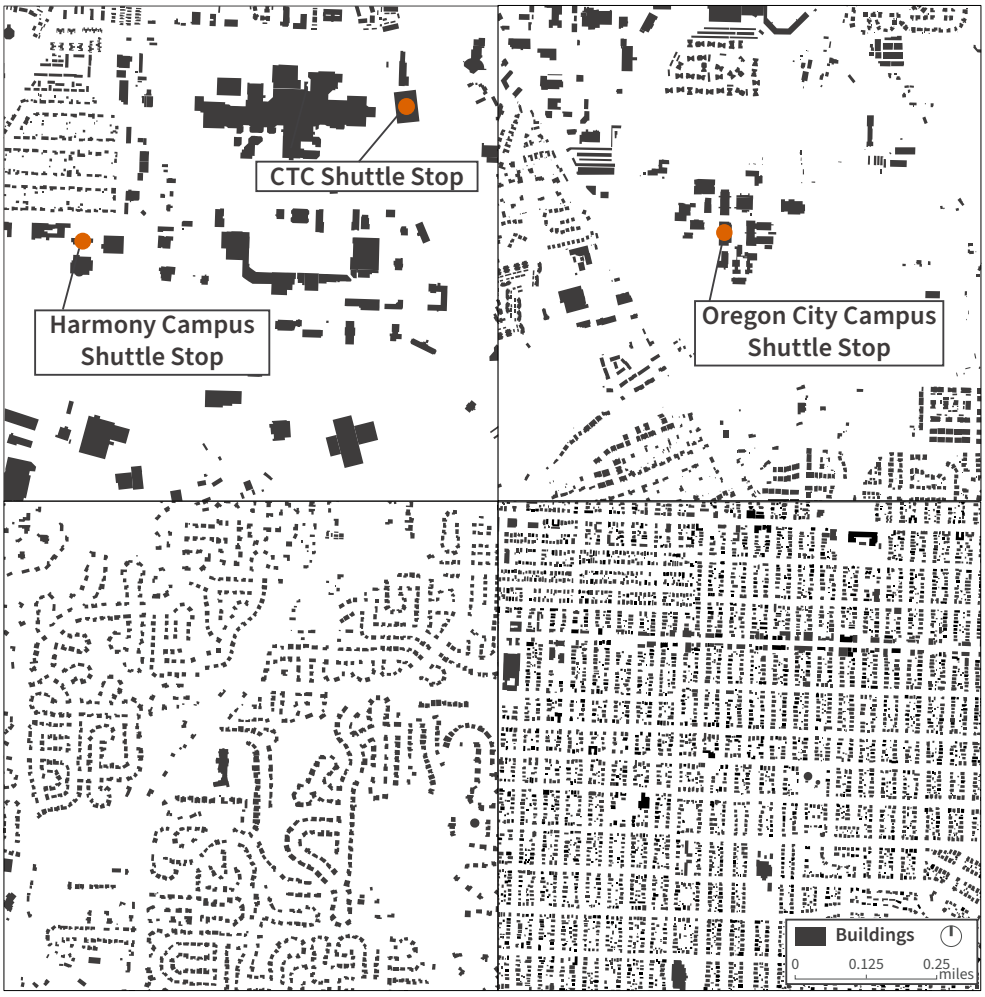


Figure 2.13. The built environment surrounding the CCC Oregon City campus.

The Oregon City campus is flanked by two major thoroughfares, South Beavercreek Road to the east and Highway 213 to the west. The core of campus is at the center of three surface parking lots and a ring road (Figure 2.13).

In the nearby residential neighborhoods of Gaffney Lane and Hillendale, the street network is largely loops and cul-de-sacs stemming off of feeders and collectors. Any pedestrians traveling to campus from the west would have to cross Highway 213, which has a 55 MPH speed limit and six lanes of vehicle traffic at the intersection with Molalla Ave/South Douglas Loop.

Students traveling from residential neighborhoods south of the Oregon City campus would do so via Highway 213 or South Beavercreek Road, which, like Highway 213, has relatively high vehicle speeds (35-40 MPH) and wide pedestrian crossings. Both streets have room in the shoulder for cyclists and pedestrians, but neither has usable sidewalks.

The area immediately around the Harmony Campus and CTC is similarly hostile to walking and biking. It is characterized by large block size and arterial boulevards with wide pedestrian crossings and high vehicle traffic speeds and volumes. Examples include 82nd Avenue, a primary arterial and state highway, which separates CTC and the Harmony campus, and at the intersection of Southeast Sunnyside Road, has six lanes of traffic. Southeast Sunnyside Road, which bounds CTC to the south, is a primary arterial with 5 to 11 lanes of vehicle traffic depending on location. West of Southeast 82nd Avenue, Southeast Sunnyside Road curves into Southeast Harmony Road, a primary arterial with 3 to 7 vehicle traffic lanes on the north side of the Harmony campus.[6]

The area immediately around both campuses is hostile to walking and biking.

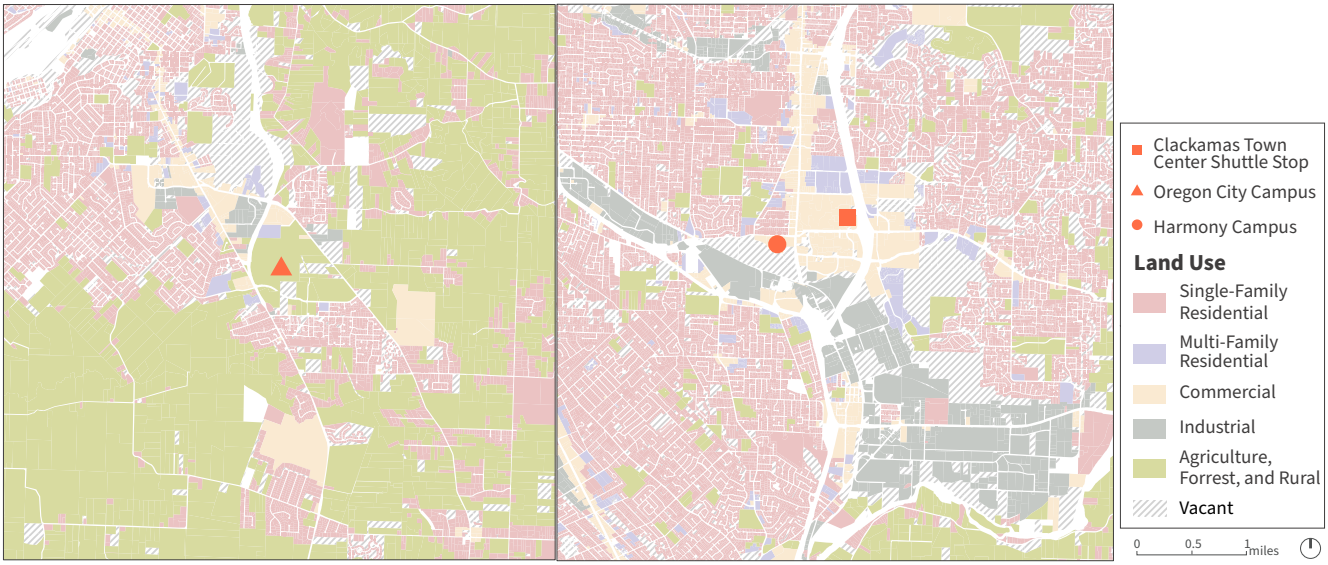
While the Harmony campus is less than one mile from CTC, a large portion of the area between the two locations is the vast surface parking lot of Clackamas Town Center (Figure 2.14). Someone walking between the transit stop at CTC and the Harmony campus would have to navigate a gauntlet of vehicles backing out of parking spots or hunting for open ones before crossing 82nd Avenue and Sunnyside Road or Harmony Road.

Street networks in residential neighborhoods to the east of the Harmony campus and CTC are made up of arterials and tertiary streets that feed into loops and cul-de-sacs. The “loop and lollipop” street pattern in Happy Valley forces people to take circuitous routes to destinations which may otherwise be geographically close, thus increasing trip distances (Figure 2.12). Moreover, I-205 acts as a literal transportation barrier between the Harmony campus and Happy Valley, since there are few streets that cross the interstate (Figure 2.14).

Figure 2.14. Aerial image of the built environment between Clackamas Town Center Transit Center and the CCC Harmony Campus.

Land-use **diversity** makes it possible for people to live near the places they need to go by mixing residential uses with commercial and other uses. Homogeneous land use, on the other hand, tends to increase auto dependency by further separating people from work, school, shopping, and other goods and services. As above, longer distances mean transit and active transportation are more time consuming.

Figure 2.15. Land use surrounding the CCC Harmony campus (left) and CCC Oregon City campus (right).

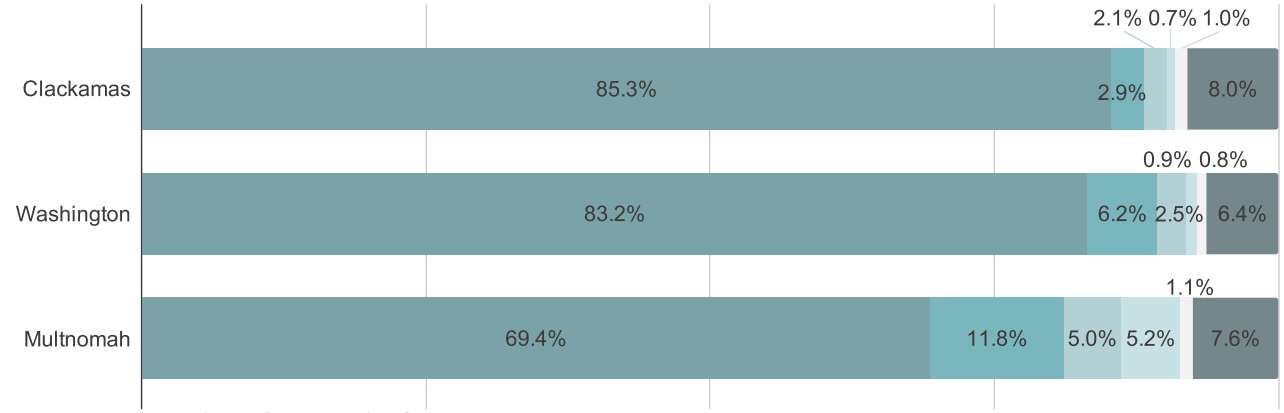


In Oregon City, most of the developed lots are single-family residential. The CCC Oregon City campus and most of the commercial and industrial land is situated on major thoroughfares like Highway 213 and South Beavercreek Road. The campus and commercial destinations are generally set back from the roads behind surface parking lots. Much of the land to the south and east of campus is agricultural land or is classified as forest or rural (Figure 2.15).

Much of the land near the CCC Harmony campus and CTC is commercial. CTC sits in the same lot as the Clackamas Town Center shopping mall and is across the street from a second large, auto-oriented shopping mall, Clackamas Promenade. East of campus, Sunnyside Road is lined with strip malls and has mostly low-density residential developments on either side. Neighborhoods to the west of the Harmony campus and 82nd Avenue, which is lined exclusively with commercial development, is single family residential. Residential neighborhoods to the south of campus are separated from it by industrial-use land (Figure 2.15).

The areas near all three shuttle stops exhibit typical suburban density, design, and land-use diversity. The combination of these factors makes driving the most convenient mode of access to campus and most other frequent destinations. The share of people

Figure 2.16. Means of transportation to work for workers 16 years and over - Clackamas Co., Washington Co., Multnomah Co.



Source: 2017 American Community Survey.

who drive to work in the area confirms this: in Clackamas and Washington counties, driving to work is much more common than it is in more-urban Multnomah County (Figure 2.16).

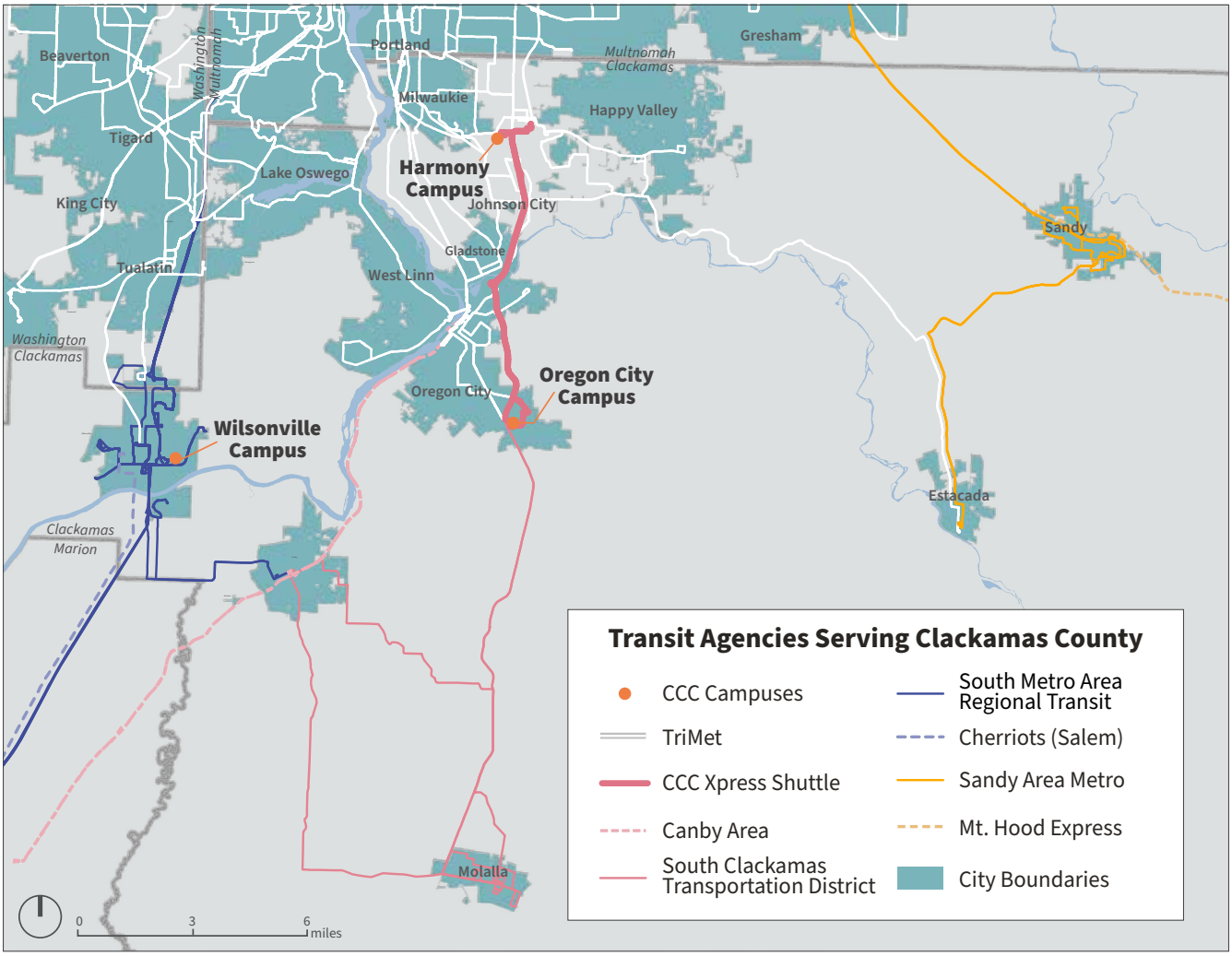
Transit network

While the automobile is the easiest mode of transportation to CCC, it is possible to get to campus by public transportation from some areas where students live. A patchwork of seven transit agencies and the CCC Xpress Shuttle serves CCC's three campuses (Figure 2.17). While the most populous areas of the region tend to have at least some transit service, many areas of rural Clackamas County to the southeast of either campus have no transit connection at all. According to CCC's Fall 2019 Transportation Survey, TriMet is the primary transit service used by students who take public transit to campus. Among students who used transit, 62% felt that commuting to campus via transit was either "somewhat easy" or "very easy," while 15% felt that it was either "somewhat difficult" or "very difficult."[7] This tells us little about the actual convenience of using transit to get to campus, however, since those who find it very difficult are likely to choose another mode if available or change something else (in the worst case, their enrollment status) to avoid the commute.

Automobile ownership

While automobile use has many negative consequences including greenhouse gas emissions, traffic congestion, worsened public health, and traffic-related deaths and injuries, personal vehicles provide unmatched access given the status quo of the built envi-

Figure 2.17. Transit routes serving Clackamas County.



ronment and transportation infrastructure. In both Clackamas and Washington County, 95% of households have access to at least one vehicle, while 87% in Multnomah County do. At least some of that difference can be explained by a built environment and transit network that facilitate car-free mobility. The actual availability of cars to students or potential students in these areas is likely lower: living in a household with a car does not necessarily mean the car is available for the student's journey to school.

Results from the Spring 2019 CCC Transportation Survey suggest that driving is the mode most frequently used by CCC students to access campus. Of the students surveyed, 88% said that they had access to a motor vehicle that they are able to drive to campus, while only 8% said that they lived within walking distance of a transit stop.

For current and potential CCC students with access to a car, the built environment as it currently exists affords them reasonably convenient but costly access to education. For those without access to a vehicle, transit is essential to their mobility. As we show in Chapter 3, at present the transit route network and frequency of service does not adequately meet the needs of all students.

Upcoming improvement projects

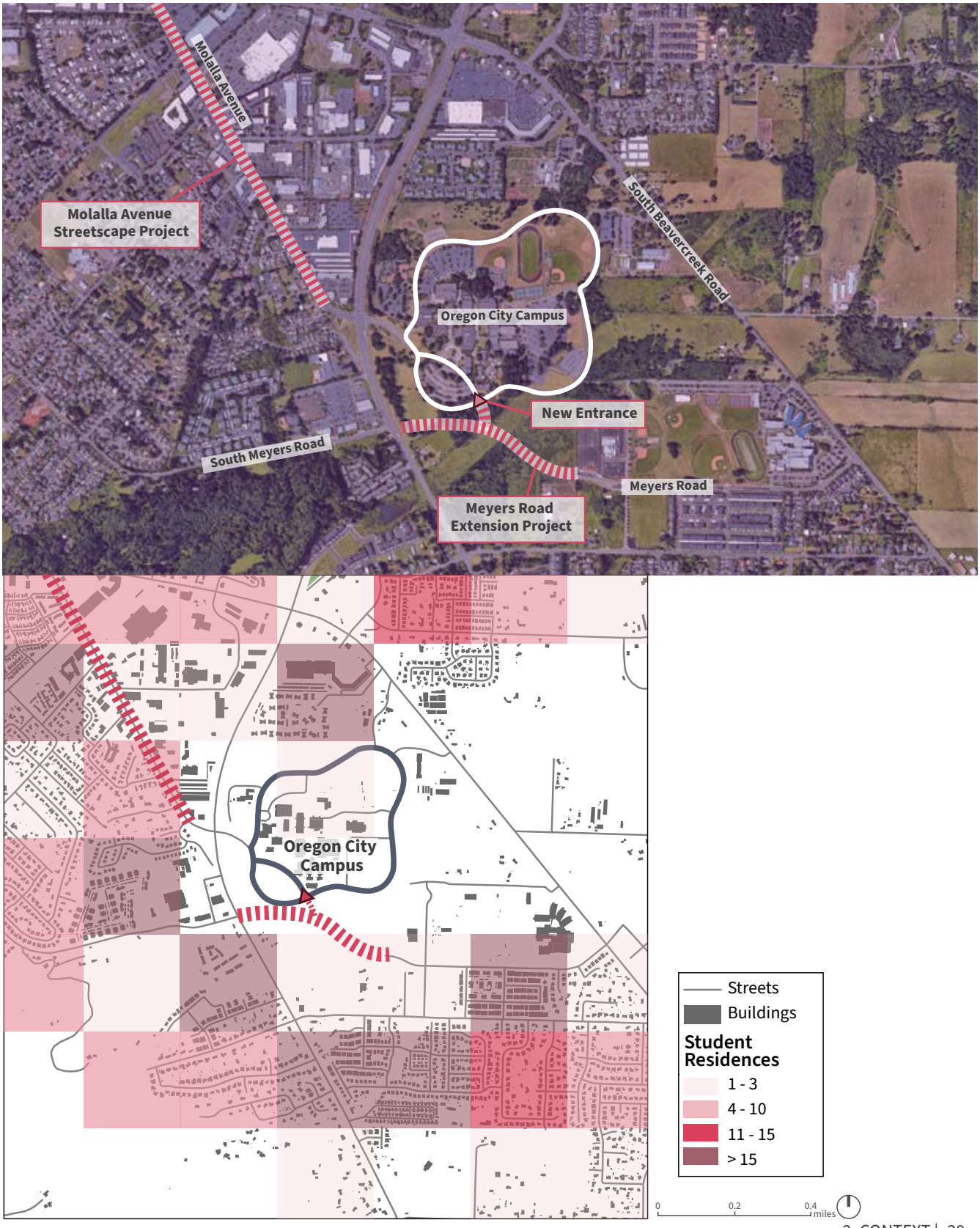
Since transit users typically access their transit stops by a mode other than driving, improvements to the walking and biking environment near CCC campuses will improve both direct access by these modes and access to the shuttle connecting the two campuses. Near both campuses, there are major streetscape or road construction projects in progress that should improve pedestrian, bicycle, and transit access. Figures 2.18 and 2.19 show the approximate residential locations of students who will be affected by these improvements. For some, the improvements may make using sustainable modes of transportation to campus possible for the first time.

Near both campuses, there are major streetscape or road construction projects in progress that should improve pedestrian, bicycle, and transit access.

Meyers Road Extension Project. The Meyers Road Extension will provide a safer multimodal connection for motor vehicles, bicycles and pedestrians traveling along Meyers Road. The project will address existing capacity concerns and provide an additional access point to CCC's Oregon City campus from the south. A key element of this project is the incorporation of buffered bike lanes, sidewalks, and ADA curb ramps. This project improves bicycle access, making bikes a more viable option for accessing the Oregon City campus. In addition, TriMet will be re-aligning some routes along Meyers Road, making those routes more direct.

Molalla Avenue Streetscape Project. Molalla Avenue from Beavercreek Road to Oregon Highway 213 in Oregon City is a key corridor for all modes. It connects Oregon City's Downtown with Clackamas Community College and connects residential areas on the west side to commercial areas on the north and east sides. Some of the highest population and employment densities in Oregon City are adjacent to the Molalla Avenue corridor. This project will consist of roadway improvements mostly on the west side of Molalla Avenue that will make the corridor safer for people biking, walking, and taking transit.

Figure 2.18. Map of upcoming improvements near the Oregon City campus (top) and nearby student residences (bottom).



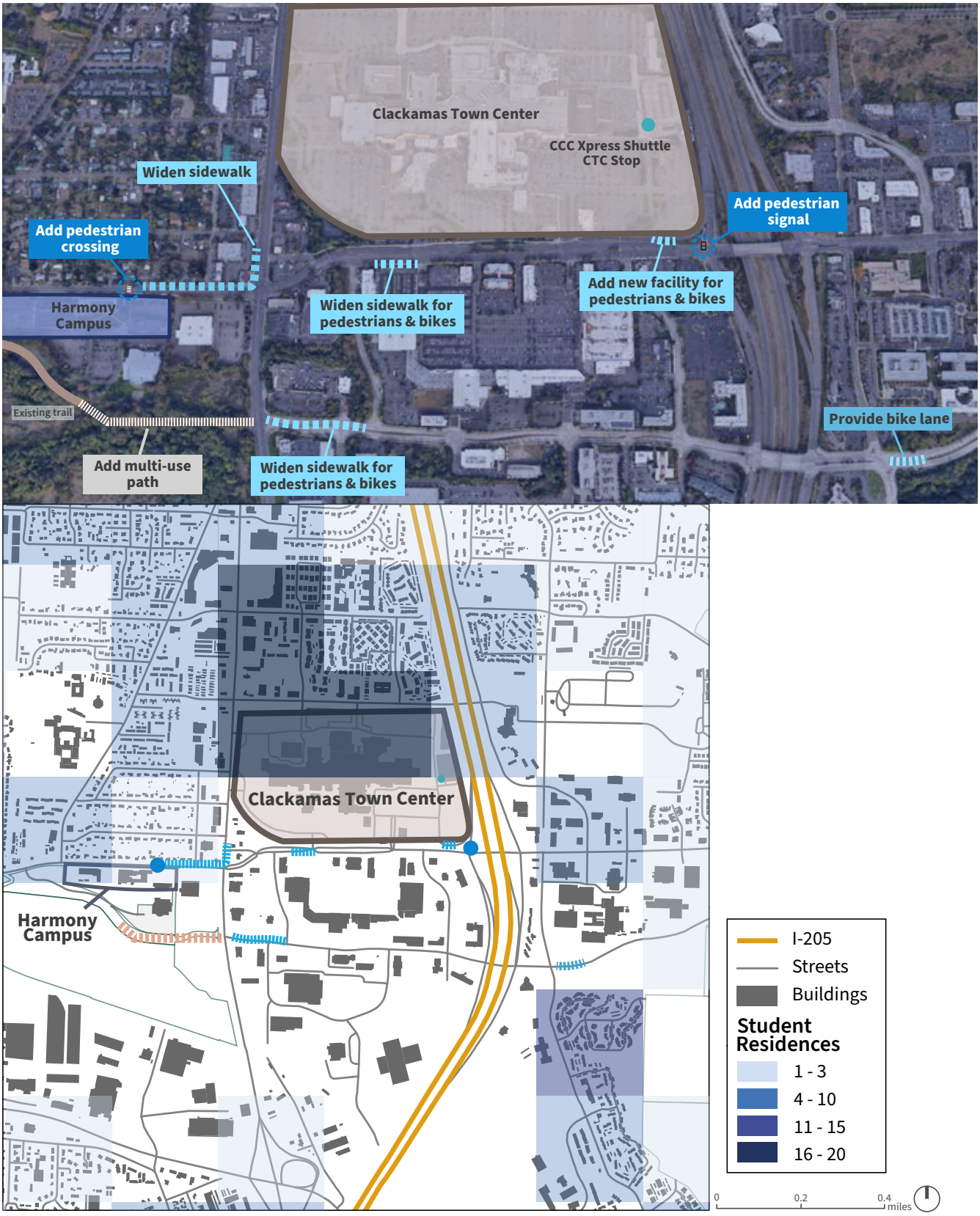
The improvements include new pavement, wider (10-foot) sidewalks on the west side of Mollala Avenue, amenities such as trash receptacles and benches, upgraded and relocated TriMet stop locations, new bike lanes to fill gaps on both sides of the street, relocated utility poles to expand the usable area of the sidewalk, and safer crossings at driveways.

Tualatin/West Linn/Oregon City Commuter, Clackamas Industrial, Milwaukie Industrial, and Oregon City Last Mile Shuttles. Several commuter and last mile shuttles are currently being planned in Clackamas County. These four shuttles are meant to be interconnected, sharing at least some stops with each other and other transit service providers, to connect low-income residents to city centers, industrial employment centers, and the regional transit network. The Milwaukie Industrial Shuttle and the Tualatin/West Linn/Oregon City Commuter Shuttle were scheduled to begin operation in June 2020, but this may be delayed due to COVID-19. The Clackamas Industrial and Oregon City Last Mile Shuttles are currently in the planning and operations phases.

Clackamas Regional Center Mobility Improvements Project. In 2017, the Clackamas County Board of Commissioners approved the Clackamas Regional Center Mobility Improvements Project, which identified over 30 transportation projects to improve safety and increase traffic flow for motorists, bicyclists, pedestrians, and transit riders.

There are two improvements that directly impact CCC's Harmony campus: a new crosswalk and center refuge island on Harmony Road at CCC and sidewalk widening on the north side of Harmony Road between Harmony and 80th avenue. On the east side of 82nd Avenue, a new, off-street multi-use path along Sunnyside Road could improve connections to Clackamas Town Center Transit Center (and therefore CCC's Harmony and Oregon City campuses) for Happy Valley residents who walk or bike.

Figure 2.19. Map of upcoming improvements near the Harmony campus (top) and nearby student residences (bottom).



PLANNING CONTEXT

Aligning the CCCSSAP with existing plans in the area should ease access to funding and provide a basis for building partnerships on particular projects.

In this section, we connect this plan with relevant plans in Clackamas County, Oregon City, and Milwaukie. There are many more existing plans and current planning processes that could have been included here, but we have focused on those that were most relevant to the intended outcomes of the CCCSSAP. Aligning the CCCSSAP with existing plans in the area should ease access to funding and provide a basis for building partnerships on particular projects.

Oregon City Transportation System Plan (2013)
The Oregon City Transportation System Plan evaluates the current transportation system and outlines policies and projects that are important to protecting and enhancing the quality of life in Oregon City.

Goals that are directly related to the CCCSSAP include:

- Enhancing the health and safety of residents
- Emphasizing effective and efficient management of the transportation system
- Fostering a sustainable transportation system
- Providing an equitable, balanced and connected multi-modal transportation system
- Identifying solutions and funding to meet system needs
- Increasing the convenience and availability of pedestrian, bicycle, and transit modes

The distribution of projects in Oregon City's TSP shows a general support for sustainable transportation improvements: 74% of projects are for sustainable modes. However, only 1% of projects are aimed at supporting transit.

The City of Milwaukie Transportation System Plan (2018)
The Milwaukie Transportation System Plan is the City's long-term plan for transportation improvements and includes policies and projects that could be implemented through the City Capital Improvement Plan, development review, or grant funding. Of the nine goals listed in the TSP, these five support the CCCSSAP:

- Safety
- Travel Choices
- Quality Design

- Reliability and Mobility
- Sustainability

Nearly all pedestrian, bicycle, and transit improvements suggested in the Milwaukie TSP would support non-automobile connectivity to CCC's campuses, especially the Harmony campus, since it is located in Milwaukie.

City of Milwaukie Community Climate Action Plan (2018)
Milwaukie's Climate Action Plan is the city's roadmap to preparing for and reducing the impacts of climate change. It was created by residents, community partners, and City staff from 2017 to 2018. In the vehicles and land use sections of the plan, several strategies are aligned with the CCC Shuttle Service and Access Plan, including

- Develop micro-transit from park-and-ride or light rail stations to local destinations,
- Increase transit service, particularly underserved employment areas,
- Incentivize employers to encourage active transportation and transit, and
- Implement parking pricing in downtown.

Reducing automobile traffic to a critical community location, the Harmony campus, is in line with the overarching objectives of the Climate Action Plan.

INSTITUTIONAL CONTEXT

CCC is already working on the two basic concerns of this plan: transportation access and equity. This section describes the institution's current programs and services intended to overcome student transportation barriers and the ongoing Diversity, Equity, and Inclusion Strategic Plan process.

Transportation programs

CCC's transportation program funding comes from several sources. Marketing for all transportation programs are funded by a 3-year $150,000 Metro Regional Travel Options Core partner grant. The funding for the operation of the CCC Xpress Shuttle comes from a 3-year $275,000 Oregon Department of Transportation (ODOT) Statewide Transportation Improvement Fund grant, and an additional $186,000/academic year of student fees are used to operate the shuttle during all terms except Summer. The Transportation Office does not currently manage car parking. Figure 2.20 shows the five current programs and services for sustainable modes of transportation.

Figure 2.20. Existing CCC programs and services for sustainable modes of transportation and their usage.

Program/Service	Usage
CCC Xpress Shuttle	**27,686 trips** 2018-2019 academic year
TriMet Student Discount	**134 term tickets sold** 2018-2019 academic year
TriMet Low-Income Fare Program	**27 enrollments** through CCC Transportation since Spring 2019
Bike Rental	**9 rentals** 2018-2019 academic year
Carpool Incentives	**8 registrations** since Summer 2019

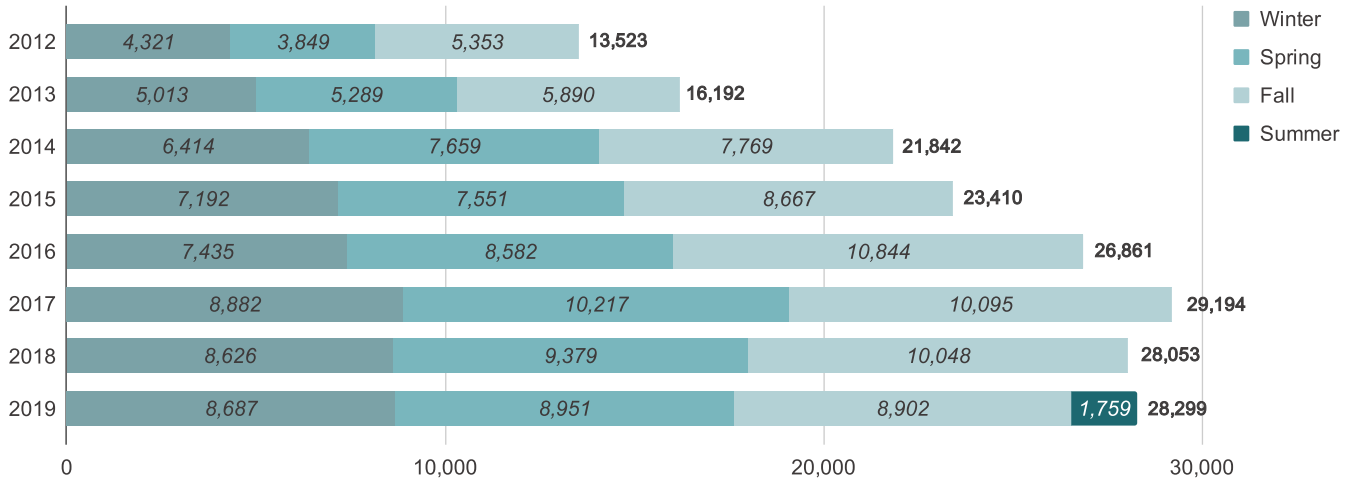
CCC Xpress Shuttle. The CCC Xpress shuttle is free to ride for students and anyone else interested in accessing CCC. It stops at the Clackamas Town Center Transit Center, CCC Oregon City, and CCC Harmony. The Xpress Shuttle began as a pilot project in Spring Term of 2010, funded by a Job Access and Reverse Commute Program grant from Metro with additional funds from Clackamas County. The original shuttle schedule only had Monday-Thursday daytime service. Evening and Summer term service were added in Summer of 2019 when CCC received the ODOT Statewide Transportation Improvement Fund grant. The schedule varies from term to term, but in Winter Term 2020, it operated with 30-45 minute headways for most of the day, switching to headways of over an hour in the evenings.

The CCC Xpress shuttle is free to ride.

Currently, shuttle operations are funded through a combination of ODOT grants and student fees. Shuttle service decisions are made by CCC's Transportation Systems Analyst under supervision of the Director of Student Life and Leadership.

CCC's Xpress Shuttle is the college's most successful transportation initiative. During the Fall 2019 term, 91% of those surveyed on-board the shuttle ride it at least a few days per week, and 35% ride it daily. Trips between the Clackamas Town Center Transit Center and the Oregon City campus were the most common. Satisfaction with the CCC Xpress Shuttle was generally high among riders surveyed: less than 1% marked "dissatisfied"

Figure 2.21. Annual CCC Xpress Shuttle ridership, 2012-2019.



The trip from CTC to Oregon City takes about an hour by TriMet buses and only 25 minutes by shuttle.

or "very dissatisfied" when asked questions about on-time performance, driver safety, and general satisfaction.[8] The shuttle saves students a significant amount of time: the trip from CTC to Oregon City takes about an hour by TriMet buses and only 25 minutes by shuttle.

TriMet Student Discount. Through TriMet's Universal Term Pass Program, CCC is able to offer a reduced fare to all registered students. The discount is $100 off a three-month pass, a 33% discount. TriMet has partnered with CCC to offer this program since the 2015-2016 academic year. The subsidy is covered by the school's student fee fund. All of the state-supported higher education institutions in the region provide some version of this subsidy.

TriMet Low-Income Fare Program. Starting in the summer of 2018, TriMet began offering a 50% discount on all single rides and a 72% discount on monthly passes to eligible riders through the Low-Income Fare program. While this program is not specific to CCC, a large portion of CCC's student body qualifies for the program.[9] Riders are automatically eligible if they receive any of a number of public benefits, including the Supplemental Nutrition Assistance Program, Medicaid, HUD Housing Choice Vouchers, or unemployment. People who earn up to 200% of the federal poverty level but are not enrolled in any of these programs also qualify for the Low-Income Fare. CCC's transportation office helps students register for this program. The process takes about 10 minutes with proper documentation, but only 27 students have registered for this program through the transportation office since Spring Term 2019. It is likely that some students register for the program elsewhere, so the actual uptake for the program is likely higher.

These transit fare programs are particularly useful because they reduce one of the biggest barriers to transit use, cost. They are limited however, because even at a reduced price transit is still not affordable to many, and discounted transit is only as good as the routes it travels.

Bike Rental. CCC also offers term-long bike rentals at $25 per term. The program began in the Fall of 2017 when CCC received

a $7,995 grant from the Clackamas County Healthy Eating Active Living grant program. Rentals include a helmet, lock, front and rear lights, fenders, and a rear rack. The bike rental program was established in partnership with Clackamas County as a tool for providing healthy and affordable transportation options. Currently, the bike rental program is underused: during the 2018-2019 school year there were nine rentals to five unique renters. The bike rental program helps solve first- and last-mile problems for some students, but there are no adaptive options for students with mobility-related disabilities.

The bike rental program helps solve first- and last-mile problems for some students.

Carpooling Incentives. CCC also encourages carpooling by providing prizes to students who choose to carpool. Prizes include Barnes & Noble and Dutch Bros gift cards, which students are eligible to receive when they sign up for Get There Oregon and log carpool trips. As of Spring 2020, only eight students have created a Get There Oregon account, and only one student has logged trips. CCC offers reserved parking spaces for students who carpool, but there is no enforcement of these spaces.

At first glance, carpooling appears to be a reasonable solution to student transportation barriers, but the coordination problem is difficult. Students have incompatible class schedules and most students (71% surveyed in 2018-2019) work in addition to going to school.[10]

CCC provides a variety of sustainable transportation programming and services for students, but few students take advantage of them. The Xpress Shuttle is the exception to this rule.

Diversity, Equity, and Inclusion Strategic Plan

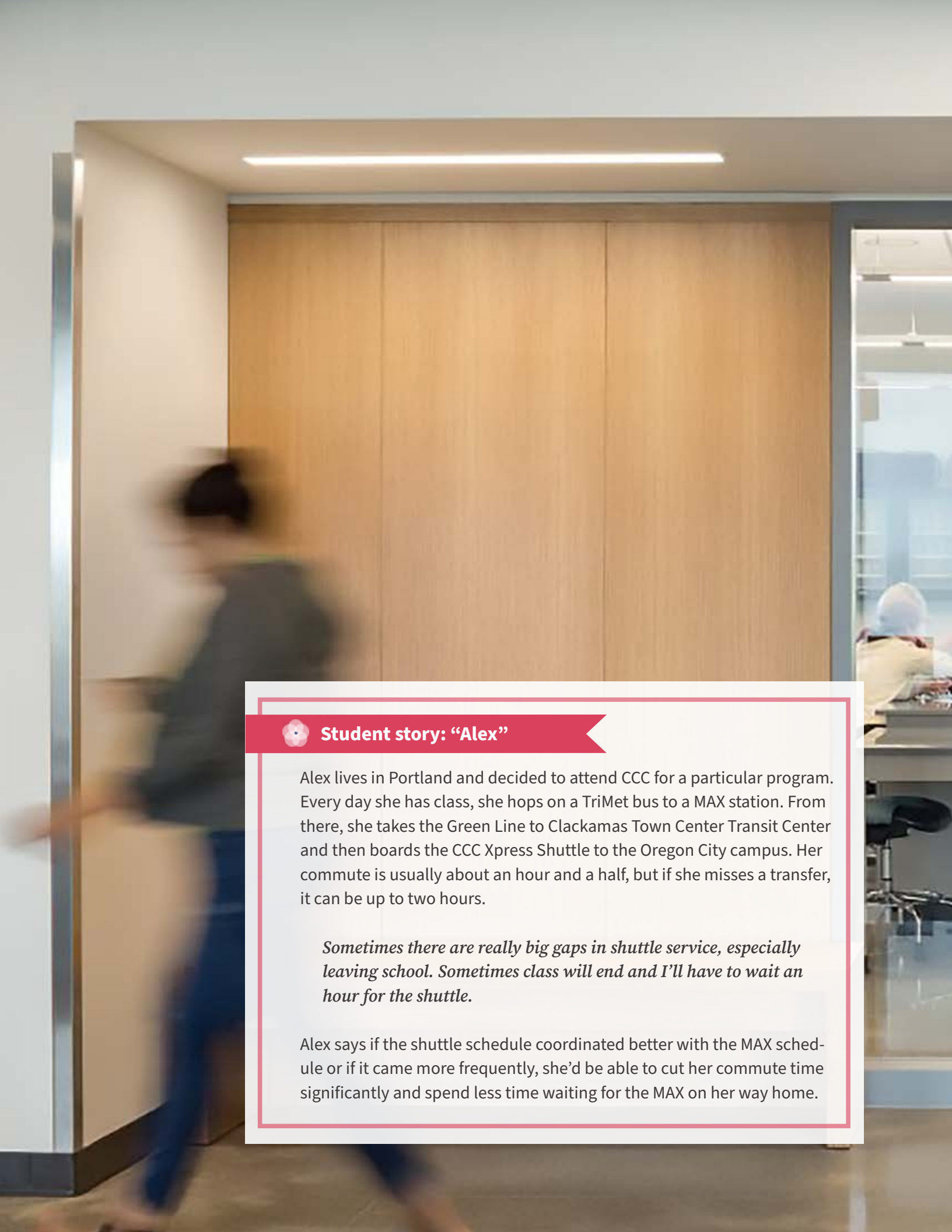
CCC is currently in the process of developing a Diversity, Equity, and Inclusion Strategic Plan. Because the CCCSSAP is centered on equitable access, connections with the DEI Strategic Plan are essential. As of May 2020, the DEI Strategic Plan subcommittee has produced a draft plan whose recommended actions are focused on building capacity for DEI work at CCC. The excerpts provided here, which we used to help guide the CCCSSAP, are from the September 2019 progress report. This early report gave more detail about the ultimate goals of the Strategic Plan.

Because the CCCSSAP is centered on equitable access, connections with the DEI Strategic Plan are essential.

The following goals were taken from sections on priorities, student experience, and success. These were generated through over 10 hours of visioning sessions with students, faculty and staff. We have included only the elements most directly related to transportation planning.

- DEI needs to be infused in and central to the institutional mission, values, priorities, strategic and operational planning, and outcome assessments.
- DEI should be practiced so it is sustainable and visible in all the College does.
- Reduce barriers for recruiting and onboarding underrepresented and underserved students.
- Providing students of all background support that allows them to succeed and reach their potential.
- The college climate should be safe, welcoming, inclusive, and visually representative of diversity and inclusion for all.
- The college should actively take steps to eliminate gaps in achievement between students of color and white students, improve retention, and reduce barriers to completion.
- The campus should be easy to navigate with clear directions.
- DEI work should be collaborative and not siloed.

In Chapter 4: Recommendations, we identify recommended actions that advance these goals.



Student story: "Alex"

Alex lives in Portland and decided to attend CCC for a particular program. Every day she has class, she hops on a TriMet bus to a MAX station. From there, she takes the Green Line to Clackamas Town Center Transit Center and then boards the CCC Xpress Shuttle to the Oregon City campus. Her commute is usually about an hour and a half, but if she misses a transfer, it can be up to two hours.

> *Sometimes there are really big gaps in shuttle service, especially leaving school. Sometimes class will end and I'll have to wait an hour for the shuttle.*

Alex says if the shuttle schedule coordinated better with the MAX schedule or if it came more frequently, she'd be able to cut her commute time significantly and spend less time waiting for the MAX on her way home.

3 BARRIERS

Through interviews and surveys, we identified existing student transportation barriers for all modes, with particular emphasis on shuttle-specific barriers. We interviewed 20 students about their experiences accessing CCC and received 569 responses to our online survey. Additional details about the student engagement methodology can be found in Appendix 3.

OVERVIEW

Through interviews and surveys, we identified existing transportation barriers for all modes, with particular emphasis on shuttle-specific barriers. We interviewed 20 students about their experiences accessing CCC and received 569 responses to our online survey. Additional details about the student engagement methodology can be found in Appendix 3.

Representativeness of engagement methods

Of the 569 survey respondents, 440 took a class at either Oregon City, Harmony, or both during Winter Term 2020. Based on Winter 2020 enrollment numbers, the survey respondents represent 3.6% of Oregon City students and 5.9% of Harmony students. Students who responded to the survey were younger and more likely to be female than students overall at both campuses. White students were also over-represented. In addition, we received more responses from students with mobility-related disabilities than would be expected based on CCC's records, though this could be because we asked about any mobility-related disability while CCC's records are for students with a documented, permanent disability. Tables comparing the demographics of survey respondents to the demographics of the student body can be found in Appendix 3.

We focused on priority populations when selecting students for interviews to correct for their underrepresentation in the survey results.

We focused on priority populations when selecting students for interviews to correct for their underrepresentation in the survey results. Demographic information is only available for 14 of the 20 students interviewed, of whom 12 had annual household incomes of less than $25,000, five were students of color, and two had mobility-related disabilities. Two students for whom demographic information is not available were contacted through the Disability Resource Center.

Transportation modes

Figure 3.1 shows the mode by which students traveled the furthest on their journeys to campus during Winter Term 2020. There are differences between the two campuses: a much higher percentage of trips to Oregon City were made by students driving alone, while many Harmony students carpooled or got a ride with someone else. The share of walking trips was much higher at Harmony than Oregon City (13% vs 1%). Some commonalities exist: students at both cam-

puses used a personal vehicle (whether driving alone, carpooling, or getting a ride) more often than any other mode, and differences in mode split between the student body at large and students of color were small. Low-income students at both campuses take public transit at much higher rates than the student body overall. Very few students biked to either campus.

When asked specifically about shuttle use, 15% of students who only traveled to Oregon City, 3.1% of students who only traveled to Harmony, and 36% of students who traveled to both campuses said they rode the Xpress Shuttle at least one day a week. According to the Fall 2019 Shuttle Survey, 16.5% of riders usually traveled between campuses.

Figure 3.1. Mode split by campus for students overall and priority populations. Because of small response numbers, students with disabilities are not separated out by campus.

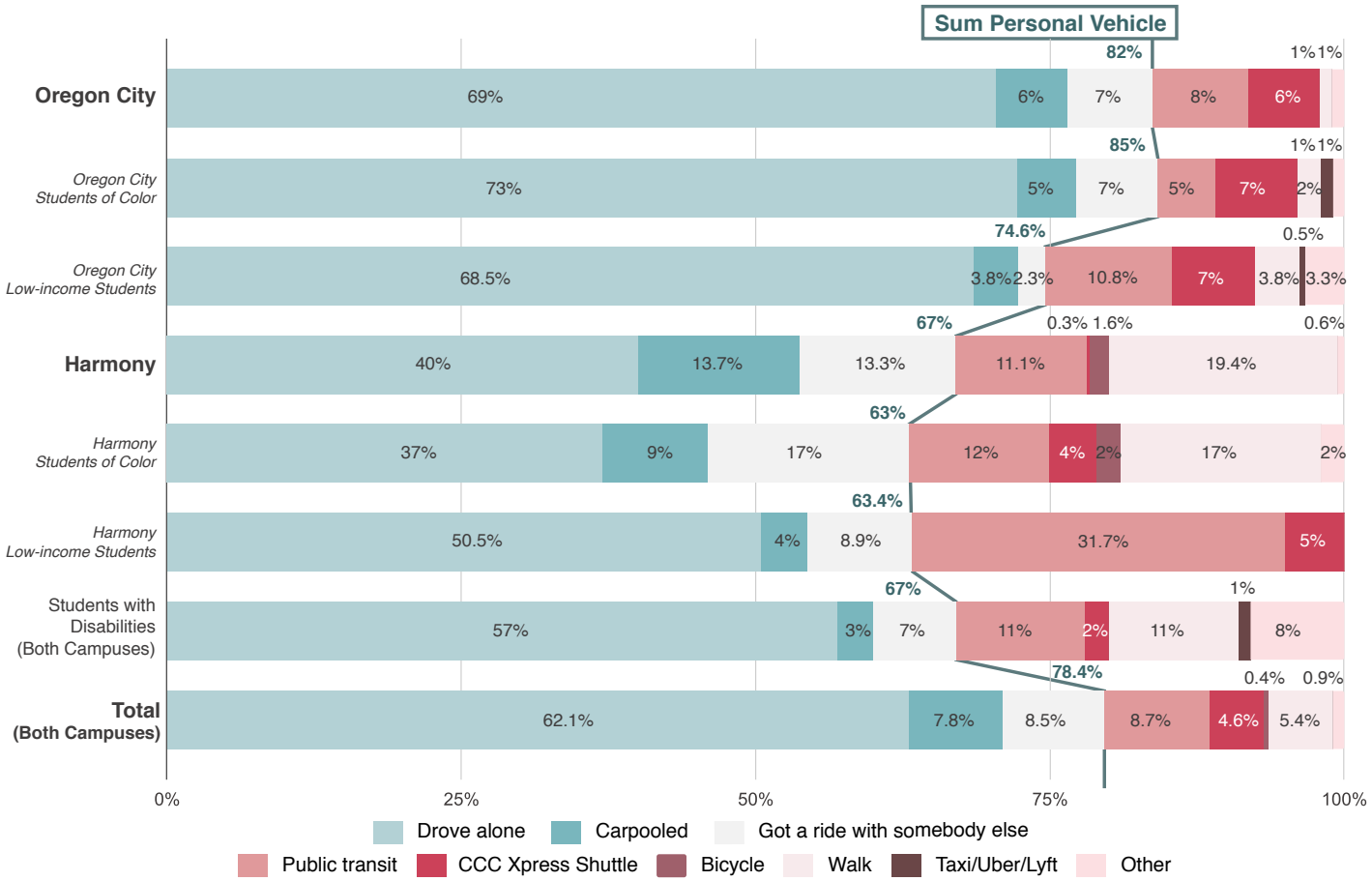
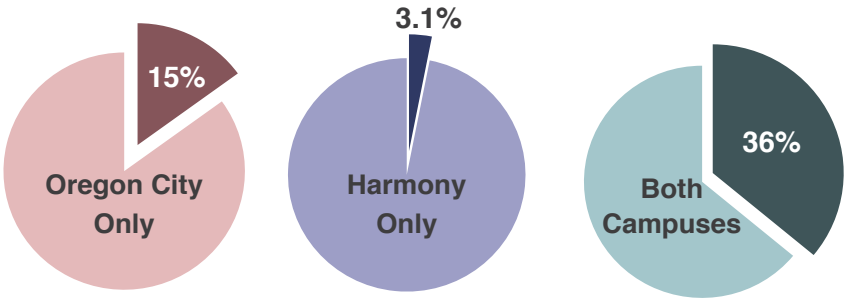


Figure 3.2. Survey respondents who attend Oregon City only, Harmony only, and both campuses who rode the shuttle at least once per week.



KEY FINDINGS

The survey and interviews revealed several themes in student transportation barriers:

- Students must balance cost with convenience, whether that is with respect to vehicle ownership or taking other transit services when they miss the shuttle.
- The CCC Xpress Shuttle is very important to its core riders, many of whom would not be able to attend CCC without it.
- There are areas for improvement in Xpress Shuttle service. Specifically, increasing shuttle frequency would resolve many of the frustrations students expressed.
- Access to the shuttle could be improved with better advertisement, translations of shuttle information into languages other than English, improved shuttle stops, and new stops close to popular destinations.
- Students were asked about the possibility of overcoming transportation barriers with micromobility options such as bike- or scootershare, but there was only lukewarm interest in these options.

Some of these barriers and opportunities are particularly relevant to the plan's priority populations. In the remainder of the chapter, we indicate where a priority population is impacted in a different way from the student body at large by indenting the relevant text block.

VEHICLE OWNERSHIP

Some interviewees who have attended CCC for more than one year took public transit or the shuttle during their first year and started driving to campus in subsequent years. Students who switched from taking the shuttle or transit to driving said that they switched once they had the ability to legally drive or had access to a vehicle. These students said that driving to campus is more convenient because their trip is quicker, they can add stops to their trip, and they have more control over their punctuality. Two of these students, however, brought up financial concerns due to the added cost of driving. Both said that if they had better access to the shuttle or transit, whether it be a stop closer to them or a quicker commute, they would prefer these options over driving because of the cost.

Two students we interviewed said that if they had better access to the shuttle or transit, they would prefer these options over driving because of the cost.

The survey also revealed the financial burden of vehicle ownership. 82% of Oregon City and 63% of Harmony students owned or shared a vehicle. Of these, 9 in 10 said that getting to class was a primary reason for owning the vehicle, and more than half said that vehicle ownership posed a financial hardship for them. This points to the need to provide lower-cost transportation options for students and to make sure that those options are convenient.

> ***Low-income students.*** If CCC decides to price parking, as we recommend in the next chapter, they should implement the charge carefully to avoid creating an additional financial burden on students who are stressed by the costs of owning a car.

IMPORTANCE OF THE XPRESS SHUTTLE

Of interviewees who primarily took the shuttle or transit to campus, their cited reasons for taking this mode fell into the following three categories:

- **Convenience** - Transit or the shuttle was the most convenient or easiest option.
- **Inability to drive** - These students did not have a license, did not know how to drive, were unwilling to drive, or did not have access to their own personal vehicle.
- **Cost** - Taking transit or the shuttle was the most financially feasible option.

One student said that without the shuttle, she would not have been able to get to school her first year attending CCC.

Several students said they are grateful for the shuttle service. This was a recurring statement from younger students and students who started attending CCC before they were legally able to drive. One student said that without the shuttle, she would not have been able to get to school her first year attending CCC. Another said that her experience on the shuttle has been "good, all the way around." This same student said she appreciates the shuttle drivers because they seem to really care about students.

Costs of other transit services

It is possible to travel from any shuttle stop to another using other transit services. At the Oregon City campus, there are many bus routes that stop at the same location at the shuttle. At Harmony, most bus routes are not located directly on campus but require a

short walk. While students seemed glad to have this flexibility given the low frequency of the shuttle service, the shuttle is the cheapest and quickest option available. If a student misses the shuttle or has a long wait between the end of class and the next shuttle departure, they can incur an unexpected cost in the form of a fare or longer trip time on another service.

If a student misses the shuttle, they can incur an unexpected cost in the form of a fare or longer trip time on another transit service.

> ***Low-income students.*** Whereas the shuttle is free at the point of use, every time a student misses a shuttle and must take TriMet, this may present financial challenges for them. One student said that because he's reliant on the shuttle, he rarely has his Hop card loaded, so even if there is a bus available, he may not take it because he doesn't have the money.

Safety

While the survey did not ask students whether they felt safer on the shuttle or on other transit services, several interviewees volunteered this information, saying that they felt safer on the shuttle. One student whose trip home from campus requires a transfer from the shuttle to TriMet said that she has been followed when leaving her TriMet stop.

> ***Students of color.*** One student told us that she did not feel safe riding TriMet to school for two reasons: first, the assault on two young Black girls on a MAX train in 2017 that led to the stabbing of three men, two of whom died; and second, "the current political climate." She said that as an African-American woman boarding public transit, she feels like she never knows what she might run into. She noted that she would feel much safer riding the shuttle with mostly other students and suggested the shuttle expand and add more stops in the areas that surround CCC campuses.

XPRESS SHUTTLE SERVICE

A majority of interviewees who rely on the shuttle and other transit services expressed some level of mental fatigue produced by the need to carefully plan their commutes and by the amount of time their commutes take. Several students said that this time and mental energy would be better put to use on doing schoolwork or taking care of other responsibilities such as housework and childcare.

Coordination with other schedules

A couple of students said evening classes can be tough at the Harmony campus because it is easy to miss the shuttle if a class runs slightly late. Though Clackamas Town Center Transit Center (CTC) is only a mile away, the walking route does not currently feel safe or comfortable. Students suggested better coordination with class schedules, especially in the mornings and evenings. Students expressed particular frustration about not having a shuttle available soon after getting out of evening classes. Some students also had trouble catching the last bus to rural areas after taking the shuttle to Oregon City from Harmony because of a lack of schedule coordination.

Capacity

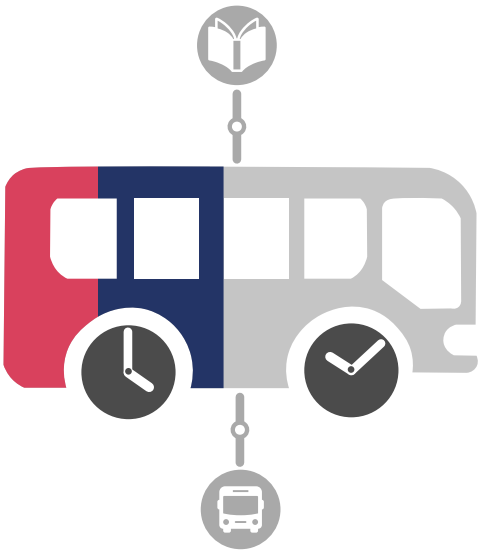
Shuttle capacity was brought up by four interviewees who have been regular shuttle users of CCC's shuttle service. For these students, overfull shuttles were deeply frustrating. Even if they arrived early to a shuttle stop, they would sometimes find the shuttle would quickly fill up and they and/or other students would be left waiting for the next one. At shuttle frequencies of 30 minutes to over an hour, having to wait for the next shuttle added significantly to their commute. One student said it was particularly exhausting waking up early to catch the shuttle only for the shuttle to be full or having to worry at the end of a long day of class whether she will be able to make it home on the shuttle or not.

Only a small fraction of students surveyed said that more room on the shuttle would make them more likely to use it, and data from the shuttle contractor shows that overfull shuttles are uncommon. Still, our interviews suggest that even if full shuttles are not particularly common, they are very frustrating for students who depend on the shuttle.

Half of regular shuttle users interviewed said that they wished the shuttle ran more frequently.

Frequency

Half of regular shuttle users interviewed said that they wished the shuttle ran more frequently. Running the shuttle at a higher frequency throughout the day and into the evening would help alleviate both the schedule coordination problem and the capacity problem above. There is probably no tweak to the shuttle schedule at current frequencies that would perfectly coordinate with all of the other schedules relevant to students. Increasing frequency, however, would make it more likely that there is a shuttle at approximately the time a student needs to ride it.



19% of Oregon City students &
27.5% of Harmony students surveyed said that the shuttle **didn't work** with their **schedule**
(classes or connections to other transit agencies)

5% of Oregon City students &
3.3% of Harmony students surveyed cited **full shuttles** as a reason for **taking another mode** to campus

6.5% of Oregon City students &
8.3% of Harmony students surveyed cited **low shuttle frequency** as a reason for **not taking the shuttle**

Stop locations

Though Wilsonville students were not part of this student engagement process, adding shuttle service to Wilsonville still came up. One student we interviewed lived in Wilsonville and exclusively drove to campus. She said that though she is able to drive to her primary campus, she knows of students who do not have the option to drive and have to take transit to Oregon City or Harmony campuses, which can take more than two hours. Another student said she had interest in taking classes offered at Wilsonville but decided not to because taking transit would be too difficult.

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> ***Students with disabilities.*** Survey respondents with a mobility-related disability ranked the proximity of shuttle stops to building entrances "Extremely Important" more often than other students.

OTHER SHUTTLE IMPROVEMENTS

Several regular shuttle users we interviewed said they did not know about the shuttle service when they first started attending CCC.

Shuttle information

82% of Harmony survey respondents and 81% of Oregon City respondents indicated they were already aware of the shuttle service, an improvement over the last two CCC surveys that asked about shuttle awareness.[11] However, our interviews with students suggest that information about the shuttle could still be better distributed. Several regular shuttle users we interviewed said they did not know about the shuttle service when they first started attending CCC. These students learned about the shuttle service either after meeting with an advisor or hearing about it directly from an instructor. One student pointed out that though the shuttle information is available in the student web portal and web onboarding, not all students are tech-savvy or know to pay attention to information

presented in that way. These accounts suggest that word of mouth, particularly from faculty and staff, may be an effective and currently underutilized method of promoting the shuttle service.

Language access. One student pointed out that information about the shuttle is only available in English. The student suggested promoting the shuttle in other languages to make sure students whose primary language is not English are informed about this option. Promoting the shuttle in the other languages most spoken by the student body is an easy and effective way of making shuttle information more accessible. Spanish and Russian were the most common primary languages indicated on the survey, but further research is needed, since the survey was only provided in English.

Because the shuttle schedule changes ever term, students may be relying on outdated schedules.

A few students questioned the accuracy of the shuttle schedule. One student said she received an inaccurate paper copy of the schedule. A couple of students said they have sometimes found the shuttle both arriving at their stop and leaving earlier than scheduled, making them miss the shuttle. Others said that the shuttle only runs until 8:00 PM, though the schedule shows the shuttle running until 10:45 PM. Because the shuttle schedule changes every term, students may be relying on outdated schedules.

Improved shuttle stops

Improved shuttle stops were of particular concern to Harmony students. 26% of Harmony survey respondents said that higher-quality shuttle stops, with shelters and lighting, would make them more likely to take the shuttle. A couple of interviewees also suggested improved shelters because of weather patterns in fall and winter terms, when days are often cold, rainy, and dark.

Students of color. Most survey respondents indicated they felt safe waiting for the shuttle. However, 33% of students of color at the Oregon City campus said that they did not.

Driver safety
89% of shuttle riders surveyed said that they felt safe riding the shuttle, and most students interviewed who have taken the shuttle regularly expressed no safety or accessibility concerns about riding the shuttle. However, two interviewees felt unsafe riding the shuttle due to how the buses are driven, which led one student to stop riding the shuttle altogether. This student said that she had reported the unsafe driving but saw no change in driving behavior nor received any word about how her report was handled. She suggested that CCC be more transparent with students when they report unsafe driving as to how these reports will be addressed.

FIRST AND LAST MILE ISSUES

The shuttle is only one leg of a student's journey to campus. Among the shuttle riders who responded to our survey, walking, getting a ride from someone else, and taking the bus or MAX were the most common modes used to access the shuttle. Walking was especially common for those who took the shuttle to Harmony. While it was less common than most other modes, over 10% of shuttle riders said that they drove and parked near their shuttle stop. None of the shuttle riders we surveyed said that they traveled to their shuttle stop by bike. This is not surprising given that only 4% of Oregon City students and 6% of Harmony students said they owned or shared a working bicycle.

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For students with classes at Harmony, we asked a set of survey questions to gauge the desire for and impact of shared micromobility connecting Harmony to CTC. CCC's Transportation Office identified this as a possible pilot project to supplement shuttle service between these two stops and to take advantage of planned safety improvements to the roadways nearby. We asked students about bikeshare and scootershare options and their likelihood of using them if they were made available.

Bikeshare
30% of respondents said they would use bikeshare for some of their trips if available. Besides being generally satisfied with their current mode of transportation between CTC and Harmony, poor weather was most often cited as the reason people would not want to use bikeshare. Traveling with too many items was also a concern, as

were not having a helmet and the cost of having to regularly rent a bike. For the most part, students of color, low-income students, and students with disabilities cited similar reasons for not using bike share as the general population.

Students with disabilities were much more likely to say that they often travel with too many items to make bikeshare a good transportation option for them. None of the students with disabilities surveyed said that they would use bikeshare for any trips.

Scootershare

Just as with bikeshare, poor weather was the primary deterrent.

Scootershare garnered slightly more positive results: 35% of respondents said that they would use the mode for some of their trips. A majority of respondents indicated being satisfied with their current mode as their main reason for not considering this mode. Just as with bikeshare, poor weather was the primary deterrent. Again, reasons for not riding were similar among priority populations and the general population with these exceptions:

Students with disabilities were again much more likely to be traveling with too many items, and they also cited not having a helmet with them as a reason for not riding. However, students with disabilities said they were more likely to use scootershare for some trips than bikeshare.

For ***students of color***, never having ridden an e-scooter before was the biggest deterrent besides satisfaction with current mode. Students of color were slightly less likely to say that they would use scootershare for at least some trips than students overall (27% vs 35%).

Low-income students were not much more likely than other students to say that the costs of bikeshare or the method of payment would prevent them from using it, but they were much more likely to say so of scootershare. If CCC moves forward with shared micromobility pilots, the program needs to have a low-cost or free option for low-income students in order to promote equitable access.

Student story: "Marley"

Marley would have to wake up at 6:30 am to catch a bus to reach the shuttle to Oregon City from Clackamas Transit Center. This was a challenge for Marley who struggles with an irregular sleep schedule. One of her family members offered to drive her to CTC in the mornings to help her get a bit more sleep. While getting to school is now more convenient for Marley with the support of her family, getting home can be quite challenging on occasions.

> *There have been a few times when I missed the shuttle home and had to take TriMet because waiting for shuttle and travel time would have been equivalent to just taking the bus. When you miss the shuttle, your option is to wait for the next shuttle or take a bus line. I've been followed taking TriMet, so I would prefer taking the shuttle. It would be safer.*

4 RECOMMENDATIONS

STRATEGIES FOR IMPROVING ACCESS

The central goal of the CCCSSAP is to improve access to campus by transit and the CCC Xpress Shuttle. Based on information about barriers to student access from the previous chapter, we developed five strategies for reaching this goal.

1. Make riding the shuttle more convenient

When the shuttle is more convenient, it becomes a viable option for students who are looking to reduce their travel times or costs. Recommended actions under this strategy are about reducing student travel times on the shuttle and increasing the reliability of shuttle service.

2. Improve access to information about the shuttle

A recurring theme in interviews was students' limited knowledge of the Xpress Shuttle service during their first and second terms attending CCC. In addition, information about the shuttle is currently only provided in English. Recommended actions under this strategy increase awareness of the shuttle and help students understand how they might be able to use the shuttle to decrease their commute time and/or cost.

3. Improve shuttle safety and comfort

While safety and comfort do not themselves reduce travel times or costs, when students feel unsafe or uncomfortable waiting for or riding the shuttle, they may no longer consider it a viable transportation option. Recommended actions under this strategy improve the rider experience.

4. Create supportive parking policies

Some of our recommended actions require additional parking enforcement, and most could benefit from having a reliable, flexible funding source. Recommendations under this strategy support the other recommended actions by creating space in parking lots for non-drive-alone modes and by creating a new funding source.

5. Expand the variety of transportation options available to students for first- and last-mile connections

Students who use the shuttle must always connect through another mode to reach their destination. Improvements near both campuses will make walking, biking, and micromobility modes more feasible options for students to access the shuttle and both campuses. The recommended actions under this strategy address these first- and last-mile connections. They make bikes more readily available to students, encourage students to try out new modes that might be more affordable and convenient for them, and encourage students with cars to participate in carpooling.

These strategies support the following draft goals from CCC's Diversity, Equity, and Inclusion Strategic Plan process:

- Reduction of barriers to college entry, especially cost of college.
  → *Strategies 1 and 5*
- Providing students of all background support that allows them to succeed and reach their potential.
  → *All strategies*
- The college climate should be safe, welcoming, inclusive, and visually representative of diversity and inclusion for all.
  → *Strategy 3*
- The college should actively take steps to eliminate gaps in achievement between students of color and white students, improve retention, and reduce barriers to completion.
  → *Strategies 1, 2, 3, and 5, with evaluation as written in Chapter 5 and Appendix C*
- The campus should be easy to navigate with clear directions.
  → *Strategy 2*

RECOMMENDED ACTIONS

The remainder of this chapter describes the recommended actions associated with these five strategies. Each action has its own page with a description of the action, funding and decision-making partners and potential supporters, and any risks and challenges we have identified. A few partners appear with many actions:

- Oregon Metro provides marketing funding for CCC's transportation programs, so they appear in any marketing-related actions.
- Clackamas County expects to be consulted in all transit planning, so they appear in all shuttle service-related recommendations.

Many of the recommendations depend on each other to work well.

Many of the recommendations depend on each other to work well, so we note the relationships between actions on each page. We also list the estimated complexity, time to completion, and cost associated with each action.

- **Complexity.** The complexity rating indicates how complicated we expect implementation of the action to be. Actions that require collaboration with many partners or partners who require convincing receive higher complexity ratings

than those that can be implemented by the Transportation Office alone. In general, higher complexity means a longer time to completion, so CCC should begin work on high-complexity actions immediately in order to accomplish them by the recommended timeline.

- **Timeline.** The timeline rating takes into account complexity, funding cycles, and dependencies between recommended actions. For example, *1.2. Move Harmony stop to the north parking lot* requires *4.1. Modify the parking enforcement program*, so it is a medium-term action.
- **Cost.** Cost ratings are meant for comparison purposes only and were developed based on existing costs. The lowest-cost actions require no or very little additional funding, medium-cost actions involve small capital improvements or require new funding, and high-cost actions involve hiring new staff or significant service expansions. Cost ratings apply to individual actions: to avoid double-counting, the cost estimate for an action does not include the costs of actions that would be required before implementation.

Finally, each action comes with a list of performance measures. We provide more information on these measures and some guidance for setting targets in Chapter 5. In this chapter, we group recommended actions by strategy. Appendix C contains a table that lists actions by their implementation timeline.

PRIORITIES

Because of the great impact that the CCC Xpress Shuttle has on student access to campus, we recommend prioritizing investments that will improve this service under Strategies 1, 2, and 3. In particular, *1.1. Increase shuttle frequency*, *1.3. Stop at CTC in both directions*, and *2.2. Provide shuttle information in languages other than English* are likely to have the greatest impact on student access. Unfortunately, state funding for increased frequency may be unavailable in the next grant cycle. Many other recommendations are low-hanging fruit that will improve access in the meantime. These include all the actions under Strategy 2 and the low-cost actions under Strategies 3 and 5. We want to emphasize that the actions under Strategy 5 are meant as complements to the shuttle service, not replacements, and so if CCC must make a choice between the higher-cost last-mile actions in Strategy 5 and increased shuttle service, we recommend increased shuttle service.

Short term (2 years)

#	Project name	Requires*	Complexity	Cost	Partners
1.3	Stop at CTC in both directions	(1.1), (1.2)	●	$	Shuttle vendor, TriMet, Clackamas County
1.5	Schedule tank refills when riders are not on board	(1.3)	●	$	Shuttle vendor
2.1	Install additional way-finding	2.2	●	$	CCC Campus Services, Oregon Metro, Shuttle Vendor
2.2	Provide shuttle information in more languages		●	$	CCC ESL Program CCC Spanish Language GED Program, Oregon Metro
2.3	Promote shuttle to faculty	2.2	●	$	CCC Faculty, Oregon Metro
2.4	Create example trip plans	2.2	●	$	CCC Student Life and Leadership, Oregon Metro
3.2	Improve driver feedback loop		●	$	Shuttle vendor
5.1	Remove GPA requirement for bike rental program		●	$	none
5.2	Make bike rental program free		●	$	none
5.6	Improve carpool program	4.1	●●	$	CCC Campus Services, Oregon Metro, RideAmigos, Get There Oregon

** While not strictly required, actions in parentheses should be implemented before or with the listed action for best outcomes.*

Medium term (5 years)

#	Project name	Requires*	Complexity	Cost	Partners
1.1	Increase shuttle frequency		●	$$$	Shuttle vendor, Clackamas County, TriMet, ODOT
1.2	Move Harmony stop to north parking lot	4.1	●●	$$	Shuttle vendor, CCC campus services, City of Milwaukie
1.4	Pilot new shuttle stops near Harmony or Oregon City	1.1	●●	$	Shuttle vendor TriMet, Clackamas County, Cities of Milwaukie and Oregon City, TriMet, ODOT, Clackamas Middle College
3.1	Improve stop amenities at Harmony		●●	$$	CCC Campus Services
4.1	Modify the parking enforcement program		●●●	$$	CCC Campus Services, CCC College Safety, CCC Student Life and Leadership
4.2	Price parking	4.1	●●●	$	CCC Campus Services, CCC Associated Student Government, CCC College Safety
5.3	Start build-a-bike program		●●●	$$	A local bike shop A CCC department, Oregon Metro
5.4	Hold a Spring Term Bike Challenge	(5.1), (5.2), (5.3)	●●	$	Community organizations/ businesses/agencies willing to donate prizes, Oregon Metro
5.5	Pilot scooter share at Harmony		●●	$$	A scootershare company City of Milwaukie TriMet CCC Campus Services, Oregon Metro, ODOT, Clackamas County

Strategy 1. Make riding the shuttle more convenient

1.1. Increase shuttle frequency

Timeline ●●○
Complexity ●○○
Cost ●●●

Increasing shuttle frequency will remedy several concerns expressed by the students we interviewed and surveyed. Many students wanted the shuttle schedule to be better coordinated with their class schedule, work schedule, or other transit providers' schedules. Increasing the frequency of service is the best way to accomplish that coordination. When frequency increases, wait time decreases, so it is more likely that a student can catch a shuttle at the time they want. An added benefit of solving the coordination problem with increased frequency is predictability across terms: when the shuttle schedule no longer has to be coordinated with the class times each term, a single schedule can be set for the entire academic year.

Increasing shuttle frequency also addresses student concerns about being unable to board a shuttle due to overcrowding. With more-frequent service, shuttle vehicles are less likely to fill up completely, which will make the shuttle a more reliable option for students. Reducing crowding is also important from a public health standpoint as long as there is no vaccine for COVID-19.

We recommend decreasing shuttle headways from 30-40 minutes during the day to approximately 15 minutes, and from over an hour in the evening to approximately 30 minutes. Exact headways will need to be negotiated with the vendor.

This recommendation would benefit all shuttle users. Based on its potential impact, we believe this action should be CCC's top priority.

If funding for new programs is available in the State Transportation Improvement Fund's next grant cycle, the project could be implemented within two years. However, there is significant uncertainty surrounding state funding for transportation projects due to the COVID-19 pandemic. We have listed a more conservative timeline for this recommendation assuming that current grants will be renewed but not increased in the next funding cycle.

Partners

Shuttle vendor
Clackamas County, TriMet, ODOT (funding)

Risks & Challenges

- Uncertainty of state funding post-pandemic

Connections to other recommendations

- Supports *1.3. Stop at CTC in both directions*
- Supports *1.4. Pilot new stops near Harmony or Oregon City*

Performance measures

- Share of students who ride the shuttle
- Student wait times at shuttle stops
- Share of students who say shuttle overcrowding is a problem
- Number of riders who are left behind at shuttle stops

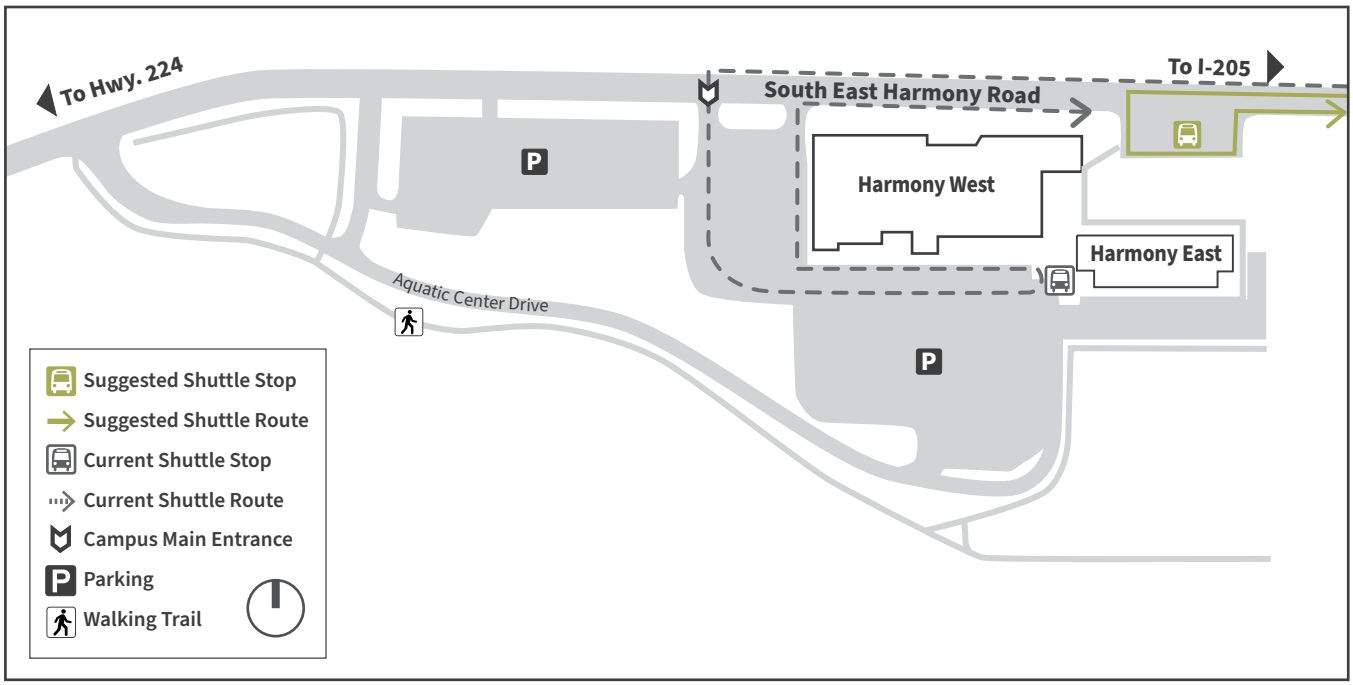
Strategy 1. Make riding the shuttle more convenient

1.2. Move Harmony stop to north parking lot

Timeline ●●○
Complexity ●●○
Cost ●●○

Moving the Harmony stop to the north parking lot on Harmony Road will reduce the travel time on any leg of the shuttle route that stops at Harmony by about five minutes. The time-savings associated with this change are small, but over the course of a day they can add up. Reducing travel time for a leg of the route allows the route to run more frequently with the same number of driver-hours.

This recommendation will require the construction of an additional egress point on the east end of the north parking lot. CCC will have to work with the City of Milwaukie, in whose jurisdiction this section of Harmony Road falls, to get the egress point approved. In addition, CCC may have to prohibit parking in this lot to give the shuttle enough room for turning and boarding. For that reason, this recommendation will work best if implemented with *4.1. Modify the parking enforcement program*.



Partners

Shuttle vendor, CCC Campus Services, City of Milwaukie

Risks & Challenges

- Only those associated with modifying the parking enforcement program (Action 4.1)

Connections to other recommendations

- Requires *4.1. Modify the parking enforcement program*
- Supports *1.3. Stop at CTC in both directions* by decreasing travel times to Harmony

Performance measures

- Share of Harmony students who use the shuttle

Strategy 1. Make riding the shuttle more convenient

1.3. Stop at CTC in both directions

Timeline ●○○
Complexity ●○○
Cost ●○○

The current shuttle route forms a loop from CTC to Oregon City to Harmony and back to CTC. This means that travel times between CTC and Harmony are drastically different depending on which direction a student is travelling. We recommend modifying the route so that the Oregon City and Harmony stops are the endpoints of a line that passes through the CTC stop.

While this would increase trip times between the campuses in one direction, it would also provide a direct connection between each campus and CTC. This direct connection to a location with so many transfer options available will make transit an easier option for both campuses, since average trip times between each campus and CTC will be reduced. Trips between the campuses are relatively uncommon in any case: the Fall 2019 Shuttle Survey found that only 16.5% of shuttle riders typically used the shuttle to get from one campus to the other.

To keep the end-to-end route time down (and therefore frequency up), this recommendation should be implemented with Action 1.2., which will shorten the Harmony leg of the route.

Partners

Shuttle vendor, TriMet, Clackamas County

Risks & Challenges None identified

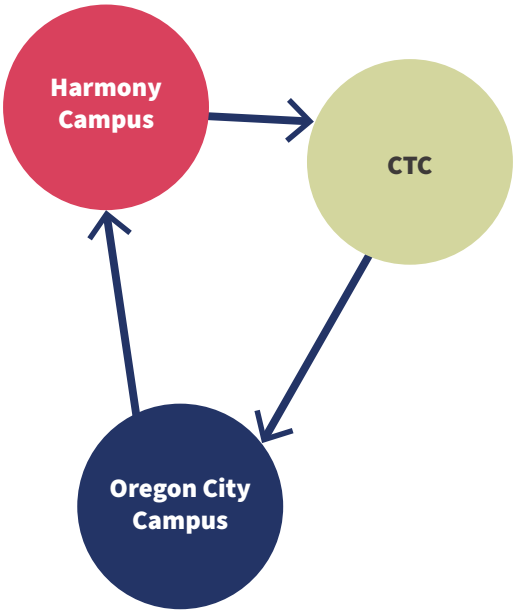
Connections to other recommendations

- Improved by *1.1. Increase shuttle frequency*
- Improved by *1.2. Move Harmony stop to north parking lot*
- Supports *1.5. Schedule tank refills when riders are not on board*

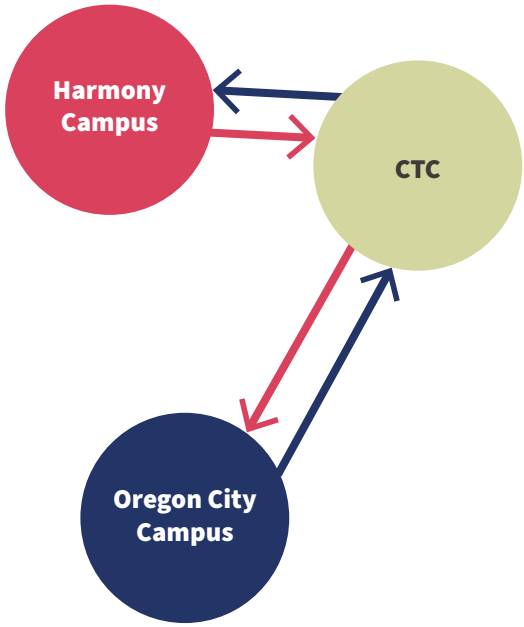
Performance measures

- Share of students at each campus who use the shuttle

Current route



Suggested route



Strategy 1. Make riding the shuttle more convenient

1.4. Pilot new shuttle stops near Harmony or Oregon City

Timeline ●●○
Complexity ●●○
Cost ●○○

In interviews, surveys, and feedback from a presentation to the Associated Student Government (ASG), students expressed a desire for additional shuttle stops. We provide considerations for planning service far off the current route in Chapter 5, but there are some destinations near the current route that could be included without too much additional research. Clackamas Middle College is one such stop, and it could be accommodated without causing delays for Oregon-City-to-CTC trips if *1.3. Stop at CTC in both directions* is implemented. While additional shuttle stops would increase the overall route time, the level of service could stay relatively consistent if CCC also increases the number of driver-hours as recommended in Action 1.1. The additional stop could be shared with one or more of the new shuttles mentioned in Chapter 2. The primary risks associated with the implementation of new shuttle stops are the additional costs, which vary depending on where the stops are located, and the potential impact on ridership if trip times become much longer. We suggest further research be done on optimal stop placement.

Partners

Shuttle vendor, Clackamas Middle College, Cities of Milwaukie and Oregon City, Clackamas County, ODOT, TriMet

Risks & Challenges

- Additional costs depending on location
- Additional research needed to determine optimal stop locations
- Impacts on ridership if trip times increase

Connections to other recommendations

- Requires *1.1. Increase shuttle frequency*
- Requires *1.3 Stop at CTC in both directions*

Performance measures

- Number of students who use new stops
- Share of students who use the shuttle

Strategy 1. Make riding the shuttle more convenient

1.5. Schedule gas fill-ups when riders are not on board

Mid-route gas stops increase trip times for riders, which can frustrate them. We recommend adjusting the shuttle schedule so that drivers can fill up when riders are not on board. This recommended action will be simpler if implemented in conjunction with *1.3. Stop at CTC in both directions*, since the shuttle vehicles will likely empty out at both ends of the route. If implemented separately from Action 1.3, we suggest filling up after an Oregon City stop for the same reason.

Timeline ●○○
Complexity ●○○
Cost ●○○

Partners

Shuttle vendor

Risks & Challenges None identified

Connections to other recommendations

- Made easier by *1.3. Stop at CTC in both directions*

Performance measures

- Number of times that drivers fill up gas tanks on the route

Strategy 2. Improve access to information about the shuttle

2.1. Install additional shuttle wayfinding

Timeline ●○○
Complexity ●○○
Cost ●○○

Interviewees told us that it took them several terms to learn about the CCC Xpress Shuttle. Adding wayfinding in high-traffic locations may increase the chance that students learn about the shuttle in their first term. Wayfinding could be large and centralized, like a large banner at each student center with the stop location marked on a map, or it could be small and dispersed, like the flyer-sized signs below. Small signs should include arrows pointing toward the shuttle stop, the time it would take to walk there, and the names of the shuttle's other stops. All new signage should state that the shuttle is free to ride, and it should be translated into the most commonly spoken languages at CCC.

Partners

CCC Campus Services, Shuttle vendor (marketing support), Oregon Metro

Risks & Challenges None identified

Connections to other recommendations

- Supports *1.2. Move Harmony stop to north parking lot*
- Coordinate with *2.2. Provide shuttle information in more languages*

Performance measures

- Share of students who are aware of the shuttle
- Share of students who are aware of the shuttle at the end of their first term

Strategy 2. Improve access to information about the shuttle

2.2. Provide shuttle information in more languages

Timeline ●○○
Complexity ●○○
Cost ●○○

In addition to more readily accessible information, we recommend providing all shuttle information in the most commonly spoken languages at CCC and ensuring that CCC's English as a Second Language and Spanish-Language GED programs are providing shuttle information to their students. Spanish and Russian were the most common languages spoken by students who took our survey, but because the survey was offered only in English, translation into additional languages may be needed.

Partners

CCC ESL Program, CCC Spanish Language GED Program, Oregon Metro
Possible supporters: TriMet

Risks & Challenges

- Coordination with translators for frequently updated transportation information

Connections to other recommendations

- Coordinate with *2.1 Install additional shuttle wayfinding*

Performance measures

- Share of students whose primary language is not English who are aware of the shuttle
- Share of students whose primary language is not English who use the shuttle
- Number of page views for CCC website pages with shuttle information in languages other than English

Strategy 2. Improve access to information about the shuttle

2.3. Promote shuttle to faculty

Timeline ●○○
Complexity ●○○
Cost ●○○

Students we interviewed shared that class announcements by professors were instrumental in their learning about the shuttle. We recommend that CCC create an informational handout for instructors to share information about the shuttle in the first or second class of the term. Faculty could also be encouraged to include information about the shuttle and other transportation programs in the resource section of their syllabi.

Partners

CCC Faculty, Oregon Metro

Risks & Challenges None identified

Connections to other recommendations

- Coordinate with *2.2. Provide shuttle information in more languages*

Performance measures

- Share of students who are aware of the shuttle
- Share of students who are aware of the shuttle at the end of their first term
- Number of times the Transportation Office promotes the shuttle to faculty

Strategy 2. Improve access to information about the shuttle

2.4. Distribute example trip plans

Trip planning can help those unfamiliar with transit become comfortable enough to try it.[12] We recommend generating example trip plans from popular locations that are simple and straight to the point, including travel times, a clear and well-designed map, and instructions for transfers. The target students for this recommendation work or live within an easy transit trip from CCC but have no idea where to start. Since many students travel to campus from locations other than their homes, at least some sample trips should be to/from non-residential locations, possibly centers of employment.

Timeline ●○○
Complexity ●○○
Cost ●○○

Partners

CCC Student Life and Leadership (for distribution), Oregon Metro
Possible supporters: PSU Transportation and Parking Services, OHSU Transportation and Parking Services, TriMet, Clackamas County, SCTD

Risks & Challenges None identified

Connections to other recommendations

- Coordinate with *2.2. Provide shuttle information in more languages*

Performance measures

- Number of page views for CCC website pages with shuttle information
- Share of students who live in areas for which trip plans exist who are aware of the trip plans

Strategy 3. Improve shuttle safety and comfort

3.1. Improve stop amenities at Harmony

Timeline ●●○
Complexity ●●○
Cost ●●○

In order to address crowding in the existing bus shelter at the Oregon City campus shuttle stop, the Transportation Office is currently working with CCC Campus Services, TriMet, and the South Clackamas Transportation District to install additional covered waiting space. The Harmony campus stop currently has no shelter, and students who take the shuttle from Harmony said that it is unpleasant to wait for the shuttle in the rain and the cold. We recommend also installing a bus shelter at the Harmony campus stop.

Partners

CCC Campus Services

Risks & Challenges None identified

Connections to other recommendations

- Wait to build improvements until *1.2. Move Harmony stop to north parking lot* is achieved or ensure that any shelters and lighting can be moved

Performance measures

- Share of students who feel safe waiting for the shuttle

Strategy 3. Improve shuttle safety and comfort

3.2. Improve driver feedback loop

At least one student has stopped riding the shuttle because of concerns that their feedback on driver safety is not being taken seriously. In order to increase transparency, we recommend that CCC close the feedback loop with each safety complaint, letting the student who made the complaint know what was done about it. Since shuttle service is contracted and complaints are sometimes fielded by the vendor, this would need to be added to the service contract.

Timeline ●○○
Complexity ●○○
Cost ●○○

Partners

Shuttle vendor

Risks & Challenges None identified

Connections to other recommendations None identified

Performance measures

- Share of students who feel safe riding the shuttle
- Share of student reports that the Transportation Office or shuttle vendor follows up on

Strategy 4. Create supportive parking policies

4.1. Modify the parking enforcement program

Timeline ●●○
Complexity ●●●
Cost* ●●○

** variable depending on extent of expansion*

Two recommended actions, *1.2. Move Harmony stop to north parking lot* and *5.6. Improve carpool program,* will require more parking enforcement than CCC currently conducts. These are important enough actions that we recommend working with CCC College Safety to make larger changes to the parking enforcement program. If additional parking enforcement staff need to be hired, we recommend hiring CCC students, perhaps through the Peer Assistant program. PSU has a much larger Transportation and Parking Services office than CCC, but student employees are responsible for the majority of parking enforcement on PSU's campus.

This action makes the most sense in conjunction with *4.2. Price parking* in order to be self-funding, but it could be implemented by itself.

Partners

CCC Campus Services, CCC Student Life and Leadership, CCC College Safety

Risks & Challenges

- Involves expanding programs that the Transportation Office is not currently responsible for

Connections to other recommendations

- Supports *1.2. Move Harmony stop to north parking lot*
- Supports *5.6. Improve carpool program*
- Could be funded by *5.2. Price parking*

Performance measures

- Number of carpool parking spot violations
- Number of parking violations at the north parking lot at Harmony
- Number of times the shuttle is delayed due to unauthorized parking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Strategy 4. Create supportive parking policies

4.2. Price parking

Timeline ●●○
Complexity ●●●
Cost ●○○

We recommend pricing parking for several reasons:

- Parking revenue could serve as a funding source for other transportation programs at CCC, including *5.1. Modify the parking enforcement program*, which is required for several other recommendations, and any of the recommendations offered here without an obvious grant source. At PSU, the entire Transportation and Parking Services office is funded through parking permits and citation revenue.[13]
- CCC's parking capacity is likely to come under increased strain in the wake of the COVID-19 pandemic due to increased enrollment (as happened after the 2008 recession) and fear of shared spaces including transit. Pricing parking can relieve some of that strain by shifting the behaviour of people who currently drive but have other options for getting to campus.
- Pricing parking is one of the most effective tools available for encouraging people to use non-drive-alone modes,[14] which CCC is required to do as a condition of some transportation grant funding.
- Surface parking typically costs $5,000 to $10,000 per space once land value, construction, maintenance, stormwater management, and indirect environmental costs are accounted for.[15] Reducing demand for parking will reduce the need to write bonds to cover additional parking construction.

The permit price must be set carefully, and CCC must offer a low-income exemption to prevent it from being too big a burden on low-income students. Participation in the carpool program (Action 5.6) should also earn students a discount on their parking fees. CCC will have to create a new system for visitor parking, perhaps offering timed, enforced free spots near building entrances.

Partners

CCC Campus Services, CCC Associated Student Government

Risks & Challenges

- Risk of restricting access for low-income students if a low-income exemption is not offered
- Setting the permit price appropriately

Connections to other recommendations

- Requires *4.1. Modify the parking enforcement program*
- Revenue from this could be used to support any other recommended actions

Performance measures

- Share of students who drive alone to campus
- Number of open parking spots at peak demand

Strategy 5. Expand the variety of transportation options available to students for first- and last-mile connections

5.1. Remove GPA requirement for bike rental program

Timeline ●○○
Complexity ●○○
Cost ●○○

Currently, information about the bike rental program lists that students must have a minimum GPA of 2.5 in order to participate. Even if this requirement is not enforced, it could be a barrier for students interested in the program. Since we found that transportation issues cause students a lot of stress that could affect their school performance, it is counterproductive to impose a GPA minimum on a program that could help alleviate some of that stress.

Partners None identified

Risks & Challenges None identified

Connections to other recommendations None identified

Performance measures

- Number of rentals

Strategy 5. Expand the variety of transportation options available to students for first- and last-mile connections

5.2. Make bike rental program free

Timeline ●○○
Complexity ●○○
Cost ●○○

Cost is a critical factor in transportation decision making, and any cost on unfamiliar modes will further discourage students from using it. Since very few students have access to a working bicycle and the bike rental program is not well-used, we recommend making the program free to reward students who choose non-auto modes of travel. Student accounts could still be charged for failure to return a bike or excessive damage. If demand for the bikes outpaces supply when the program is free, then the price can be increased. If the bike rental program is not free for all students, it should at minimum be free for low-income students.

Partners None identified

Risks & Challenges None identified

Connections to other recommendations None identified

Performance measures

- Number of rentals

Strategy 5. Expand the variety of transportation options available to students for first- and last-mile connections

5.3. Start a build-a-bike program

Timeline ●●○
Complexity ●●●
Cost ●●○

This program would subsidize bike ownership and equip students with the knowledge and ability to maintain their own bikes, potentially increasing their likelihood to use a bike as a primary mode of transportation. As we imagine it, the build-a-bike program would be a partnership with a community-based cycling store. CCC would purchase (or have donated) the tools and parts necessary to construct complete builds, and students would work towards building their own bike. We anticipate this program starting out as a small pilot and growing if student interest is present. If there are CCC departments willing to house the program, it could be offered for credit. The biggest challenges for this program are establishing the partnership with a local bike shop and finding a space to serve as a workshop. The Oregon Metro Regional Travel Options Core Partner grant may be used for marketing, tools, and parts.

Partners

A local bike shop, A CCC department, Oregon Metro
Possible supporters: Clackamas County or City of Oregon City (space), PSU Bike Hub

Risks & Challenges

- Finding an appropriate partner may take some time
- It may be difficult to find a CCC department that wants to house the program and space for the workshop

Connections to other recommendations None identified

Performance measures

- Number of students who are aware of the program
- Number of students who participate in the program
- Number of students who commute by bike after the program

Strategy 5. Expand the variety of transportation options available to students for first- and last-mile connections

5.4. Hold a Spring Term Bike Challenge

Timeline ●●○
Complexity ●●○
Cost ●○○

Bike Challenges are a popular way for institutions to encourage their employees and/or students to try a new mode of transportation and reduce VMT. The Challenge's role in increasing access to CCC is to encourage students to try a new mode that may be cheaper, quicker, or more reliable than their current mode.

Incentives play a critical role in transportation decision making.[16] We recommend using participation incentives that will appeal to most students, including tuition subsidies, cash, free meals, and PE credit.

The Bike Challenge should occur after the street improvements near each campus are complete (Spring 2022 at the earliest).

Partners

Community organizations/businesses/agencies willing to donate prizes, Oregon Metro
Possible supporters: The Street Trust, PCC, PSU

Risks & Challenges None identified

Connections to other recommendations

- Encourage participation by coordinating with *5.1. Remove GPA requirement for bike rental program*
- Encourage participation by coordinating with *5.2. Make bike rental program free*
- Encourage participation by coordinating with *5.3. Start a build-a-bike program*

Performance measures

- Number of students who participate in the program
- Number of students who say that they will commute by bike or walk after the Spring Challenge
- Share of students who are aware of bike-related programs at CCC

Strategy 5. Expand the variety of transportation options available to students for first- and last-mile connections

5.5. Pilot scootershare at Harmony

Timeline ●●○
Complexity ●●○
Cost ●●○

Data from existing bikeshare and scootershare systems throughout the US show that the average station-based bikeshare and scootershare trips are about 1.2 miles, slightly longer than the distance from the Harmony campus to CTC.[17] Micromobility options could provide a supplement to shuttle service for Harmony students but should not be considered a replacement.

Scootershare was slightly more popular than bikeshare among all students and students with disabilities in our Harmony survey, so we recommend piloting shared micromobility with scooters instead of bikes. Our survey revealed several equity concerns with scootershare that make the details of the program important.

- Low-income students were the most likely to cite the cost and payment method for scootershare as a reason for not using it, so CCC should subsidize and/or offer free memberships to low-income students. PSU's free Biketown memberships for students provide a good example. It may also be necessary to offer ways to circumvent the typical requirement that members register with a credit card.
- Students of color were more likely to say that not having ridden an e-scooter before was their reason for not wanting to use the service to get to campus, so we recommend having a test-drive day at the beginning of the pilot.
- Finally, many students were concerned about weather and not having helmets. We recommend that CCC distribute helmets and ponchos several times during the pilot to address these concerns.

Docked scooters would ameliorate Campus Services' concerns about clutter, but they are more expensive and less common than dockless scooters. We recommend that CCC consider dockless scooters if geofences can be set small enough to prevent clutter. The bike cage at the Harmony campus is a promising location for geofences.

Partners

Scooter company, City of Milwaukie, TriMet, CCC Campus Services, Oregon Metro, ODOT, Clackamas County

Risks & Challenges

- Scootershare companies are folding during the COVID-19 pandemic, which could make it hard to attract one. On the other hand, this may provide an opportunity to acquire some e-scooters at low cost, after which CCC could have complete control over the program.
- Trade-offs between cost and clutter.
- Possible pedestrian safety issues, particularly for pedestrians with mobility-related disabilities.

Connections to other recommendations None identified

Performance measures

- Number of students who use the program
- Number of students who are aware of the program
- Number of students who feel the program makes it easier to commute to CCC with non-drive options

Strategy 5. Expand the variety of transportation options available to students for first- and last-mile connections

5.6. Improve carpool program

Timeline ●○○
Complexity ●●○
Cost ●○○

When more students offer their cars for carpooling, more students without cars are able to access campus or get a ride to the shuttle. A report prepared by the Texas A&M Transportation Institute lists ridematching, priority parking for carpool vehicles, and guaranteed ride home programs as techniques employers or institutions can use to encourage carpooling.[18] We recommend that CCC use the first two techniques.

- **Ridematching.** The current ridematching process through Get There Oregon is static. The Transportation Office is working with RideAmigos to convert CCC's ridematching to dynamic matching to accommodate changing student schedules.
- **Priority carpool parking.** While CCC has marked carpool spots at both campuses, they are not currently enforced. Without enforcement, they do not incentivize carpooling. We recommend one of two enforcement strategies: either issue general carpool parking permits to students registered with the ridematching service, or assign numeric spots for regular carpoolers. Carpoolers could become eligible for permits by reaching a target number of shared trips each term.

In addition, we recommend increasing the incentives for carpooling. We suggest piloting award amounts for carpooling somewhere between $25 and $50 dollars to explore the impact this has on student behavior. If successful we recommend permanent implementation.

Partners

CCC Campus Services, Oregon Metro, RideAmigos, Get There Oregon

Connections to other recommendations None identified

- Requires *4.1. Modify the parking enforcement program*

Performance measures

- Number of carpool trips per term
- Number of students who feel using carpool is easy


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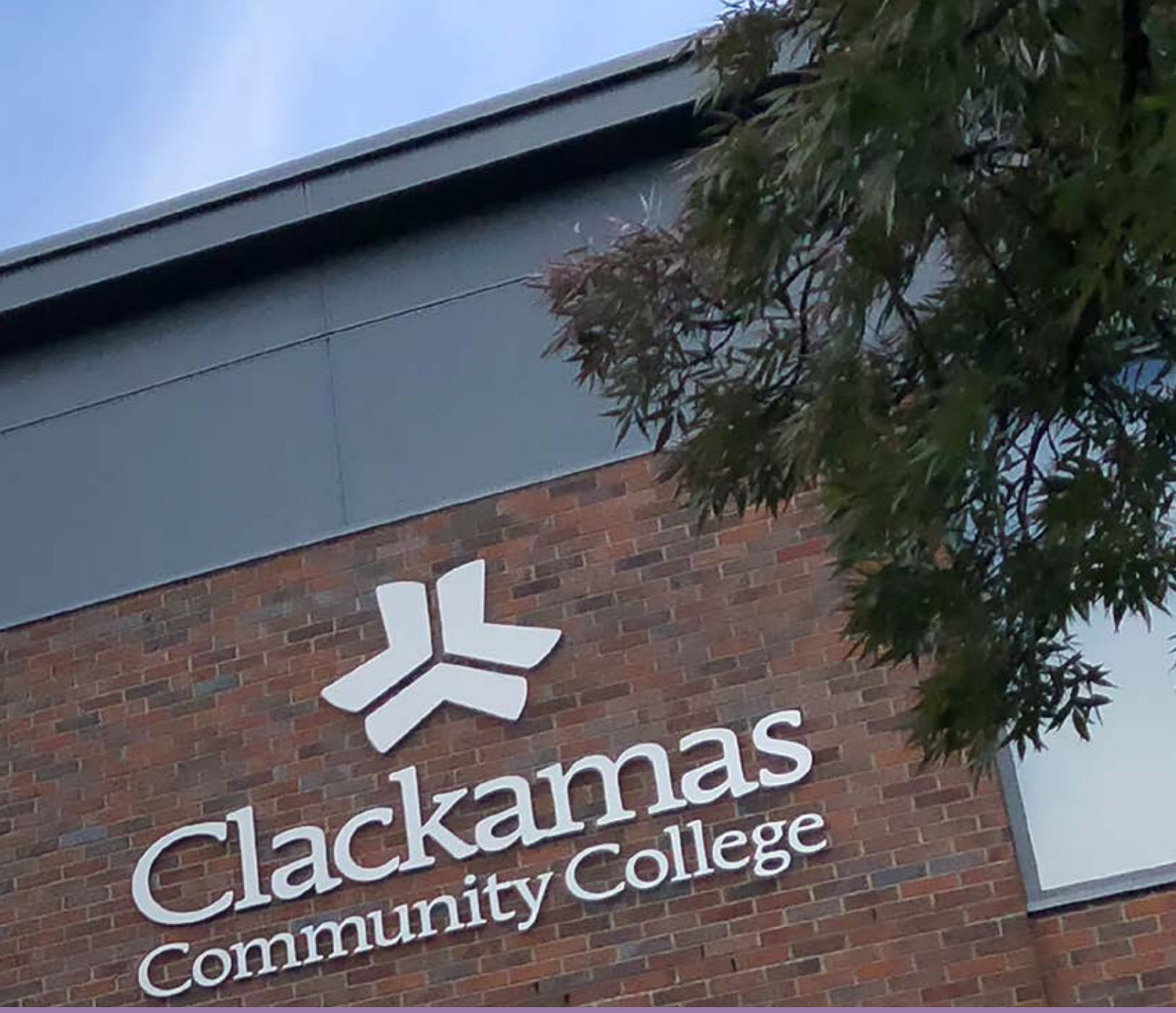
Student story: “Laura”

Laura lives in Wilsonville and mostly attends the Oregon City campus. As much as Laura would prefer not to drive, it’s the only feasible option for her. If she were to take public transit to the Oregon City campus, her commute would include four transfers and take at least two hours. Laura feels lucky to have a car but worries how she’d get to school if it broke down. Further, she’d prefer to save money that is currently going to her gas and other car-related costs. Laura also knows there are other students attending the Harmony or Oregon City campus who don’t have access to a car and are reliant on public transit. Her ideal commute would be a convening point in central Wilsonville where CCC students could board a bus or shuttle that goes straight to the other campuses.



5 EVALUATION & FUTURE PLANNING

This chapter provides guidance for making future decisions about the actions recommended in the previous chapter and future planning processes.

MEASURING PERFORMANCE

Regular evaluation is essential to ensure that improvements are being distributed equitably.

We recommend measuring the performance of each recommended action annually so that CCC can identify any obstacles and make needed changes. Regular evaluation is also essential to ensure that improvements are being distributed equitably and that priority populations are benefiting from them. Furthermore, regular evaluation provides an opportunity for continued stakeholder engagement through the implementation phase.

Principles for choosing measures

To track the status of each project or program accurately and efficiently, the indicators used to measure performance should meet these criteria:

- The measure is directly related to outcomes.
- It is specific and does not use any vague words that need to be defined.
- It is not too complicated to measure.
- Measurement is practical and inexpensive.
- The results and information sources are reliable.[19]

We used these criteria to set the recommended performance measures, which are listed under each recommended action in Chapter 4 and compiled into a master list in Appendix C.

Focus on equity

It is important to evaluate the impact of projects and programs on students of color, low-income students, students with disabilities, and other marginalized student groups. Evaluating this impact is impossible without collecting data on race, income, and disability with most performance measures. For the measures marked "Disaggregate" in the appendix, evaluations should compare priority populations to overall results to assess the equity of impacts. Projects with more positive impacts on priority populations should be prioritized when CCC makes decisions about which pilots to make permanent and which programs to continue.

Data collection

Data for the performance measures can come from the following sources:

- **Surveys.** CCC currently collects information on student transportation through three surveys: On-board shuttle surveys, the Leavers Survey, given to students who discontinue their enrollment at CCC, and an optional transportation section distributed with the twice-a-year general student survey. The excellent response rate to our survey suggests that a separate transportation survey may get more responses than the optional transportation section. CCC should conduct a general student transportation survey twice a year and continue to incentivize participation with gift card raffles.
- **Interviews.** Some measures are best evaluated through in-depth interviews. Interviews also provide the opportunity to discover unknown barriers. Because surveys tend to over-represent white and higher-income people, CCC should focus on priority populations for interviews. While this plan relied heavily on the survey for identifying interview participants, we recommend recruiting participants through the student groups, programs and resource centers listed in Appendix B to ensure that students who do not take the surveys are still included.
- **Participation numbers.** For some programs, participation numbers will be collected as a matter of course. Again, it is important to collect demographic information as well to assess disparate impacts on priority populations.
- **Shuttle data collected by the contractor.** In the past, the shuttle vendor has tracked ridership, on-time-performance, and other shuttle-related information and shared that with CCC.

What is the impact of the project on students of color, low-income students, students with disabilities, and other marginalized student groups?

Using performance measures for decision making

Once CCC collects enough information about the performance of the projects through the performance measures listed above, the next step is analyzing them to inform decisions about future projects and planning. Evaluation should focus on these three key issues:

- **Student needs.** Is the project in line with student interests and concerns?
- **Equity.** What is the impact of the project on students of color, low-income students, students with disabilities, and other marginalized student groups?
- **Magnitude of impact.** What is the increase in sustainable transportation access for CCC students associated with the project? What are the cost savings?

It is essential that the evaluation of the project not be based purely on whether or not the target performance measures are met. Target performance measures should be set ambitiously, and progress toward them could be enough to justify continuing a project. In addition, performance measures themselves should be revisited annually. They should be tested against the principles for choosing measures that we used above to make sure they are still relevant, informative, and efficient.

Ridership is an important measure of the magnitude of impact of the CCC Xpress Shuttle. However, decisions about whether to cut or continue service should not be based purely on ridership since route segments or times of day with low ridership are still important for access.

Suggestion: Annual performance measurement spreadsheet

We suggest using something like the spreadsheet in Appendix C to track all performance monitoring. Whatever method of tracking CCC uses, however, the method should review the connection between the project being evaluated and the final goal, gather all the relevant performance measures in one place, check the project against the three key issues listed above, and reevaluate the performance measures.

FUTURE PLANNING

The *Clackamas Community College Shuttle Service and Access Plan* serves to move transit and shuttle investments forward for students of Clackamas Community College's Oregon City and Harmony campuses. We developed an extensive list of recommendations based on virtual student engagement, but in-person student engagement would have made deeper analysis possible. There are several other unanticipated gaps in the plan. We hope that CCC can prioritize improvements in these areas in future planning.

- Because the engagement transitioned to virtual platforms, students with limited or no internet access were largely excluded. If in-person engagement continues to be a public health hazard, CCC should consider methods that would make it possible for these students to participate. These could include SMS-based surveys or the option to request a paper survey.
- On our survey, 9.7% of Harmony students and 11.3% of Oregon City students indicated that they had a mobility-

related barrier or disability. The survey did not ask any disability-specific questions, and since almost all interviewees were already shuttle riders, we may have missed important information about barriers to shuttle access for students with disabilities. In the future, we recommend more collaboration with the Disability Resource Center in designing survey materials to prevent this sort of oversight.

- While we attempted to connect with students who do not speak English as a first language, this group of students was not thoroughly interviewed nor surveyed. We believe primary-language interviews or focus groups are the best engagement method for understanding the barriers these students face, and we encourage CCC to budget extra time for scheduling these interviews in future planning processes.

Expanding scope

In future planning where time is less constrained, CCC could expand the focus of transportation planning to include a broader range of stakeholders:

In future planning where time is less constrained, CCC could expand the focus of transportation planning to include a broader range of stakeholders

- **Staff and faculty.** Focusing on student transportation barriers simplifies the engagement strategy, and students are the most numerous group traveling to CCC on a regular basis. However, including staff and faculty would allow for a richer understanding of the transportation system serving CCC.
- **Wilsonville campus.** Due to capacity, equity, and scope considerations, the Wilsonville campus was not included in the CCCSSAP. As we found in Chapter 3, however, there is some demand for a fast and affordable transit connection to the Wilsonville campus. If CCC decides to plan for service to Wilsonville, that plan could be informed by student engagement work from the CCCSSAP and could use our Oregon City/Harmony-specific survey questions as a template for a Wilsonville-specific survey.
- **Potential students.** CCC has expressed an interest in focusing transportation planning on potential future students as well as current students, since the barriers preventing potential students from accessing CCC may not be the same as those faced by current students. The public engagement plan would have to be designed differently from our campus-based student engagement plan. Below, we give some recommendations for identifying priority areas for future planning.

Depending on the exact scope of future planning, CCC may need to make decisions about where to conduct off-campus public engagement or where to consider adding shuttle service. We recommend selecting focus areas partly through demographic analysis, in keeping with the goal of ensuring equitable access to campus. Below, we have provided maps of the current transit travel times to Oregon City and Harmony campuses overlaid on the share of the population who are people of color (Figure 5.1), the median household income (Figure 5.2), and the share of households with no car available (Figure 5.3).

We recommend prioritizing areas in which

- People of color make up at least 5% of the population,
- Median household incomes are lower than $25,000,
- Greater than 7% of households have no car available, and
- Transit trips to one or more campuses take longer than 60 minutes.

A second tier of focus areas could include slightly higher incomes and transit travel times between 30 and 60 minutes. CCC should supplement this Census-data based approach to identifying focus areas with consultation with its partners, including high schools and community based organizations, who may be able to identify additional areas.

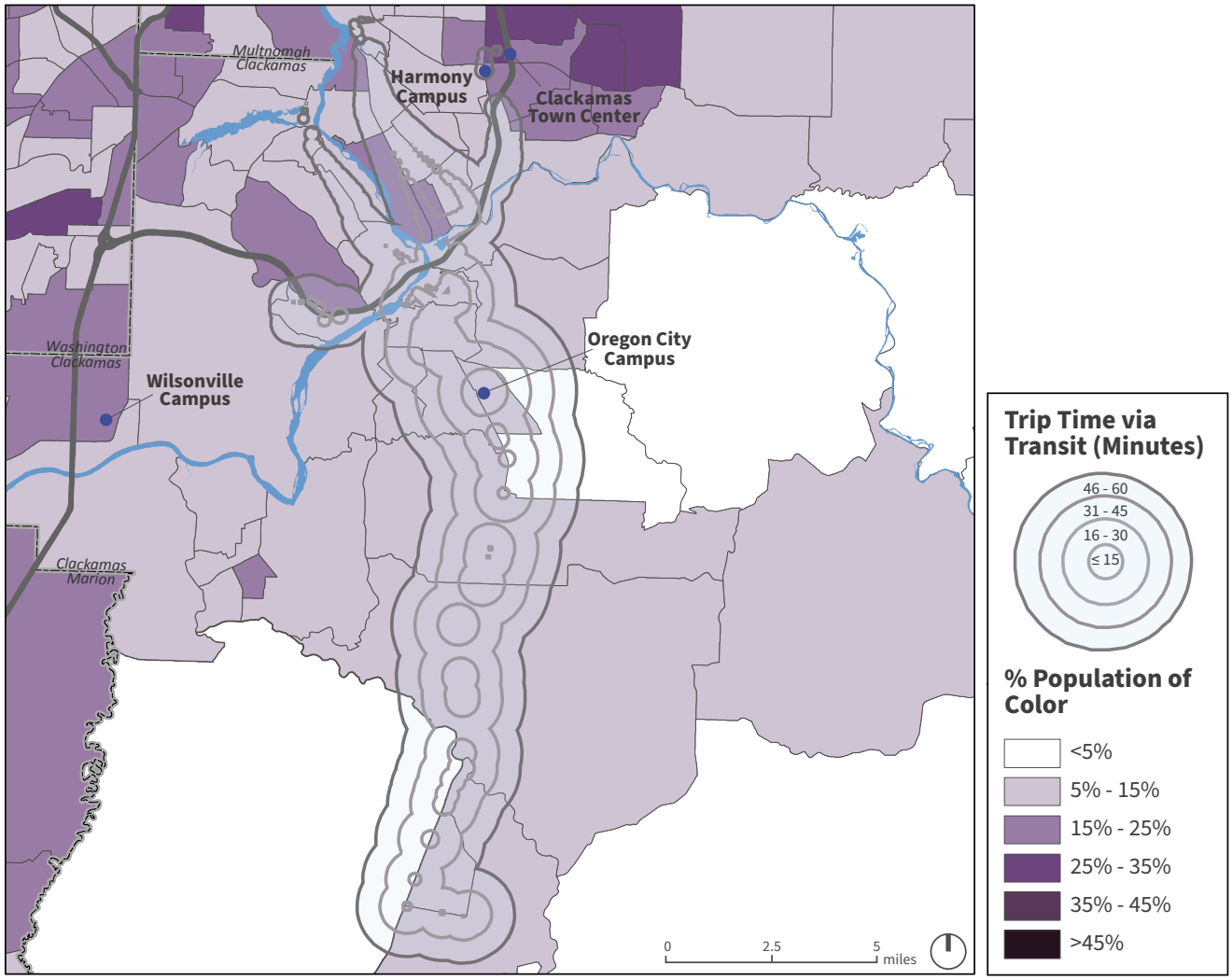
Committing to centering equity work in future shuttle service and access projects is essential. CCC transportation planners should continue to work with the ongoing DEI planning processes on campus with shared goals of eliminating barriers to entry and completion of CCC degrees.

CCC transportation planners should continue to work with the ongoing DEI planning processes.

Plan automobile and sustainable transportation together

Our final recommendation is an organizational one. Every mode of transportation to campus has impacts on the others, and considering them separately means missing some opportunities for creative solutions that involve more than one mode. Housing both automobile-centric and sustainable mode programs and policies under one office would make it easier to consider trade-offs between all modes. Consolidated transportation planning would also create an intuitive pathway from revenue generation (for example, by pricing parking) to funding for programs.

Figure 5.1. Transit travel times to Oregon City and Harmony campuses and share of population of color by census tract.



Source: American Community Survey 2017 via Remix.

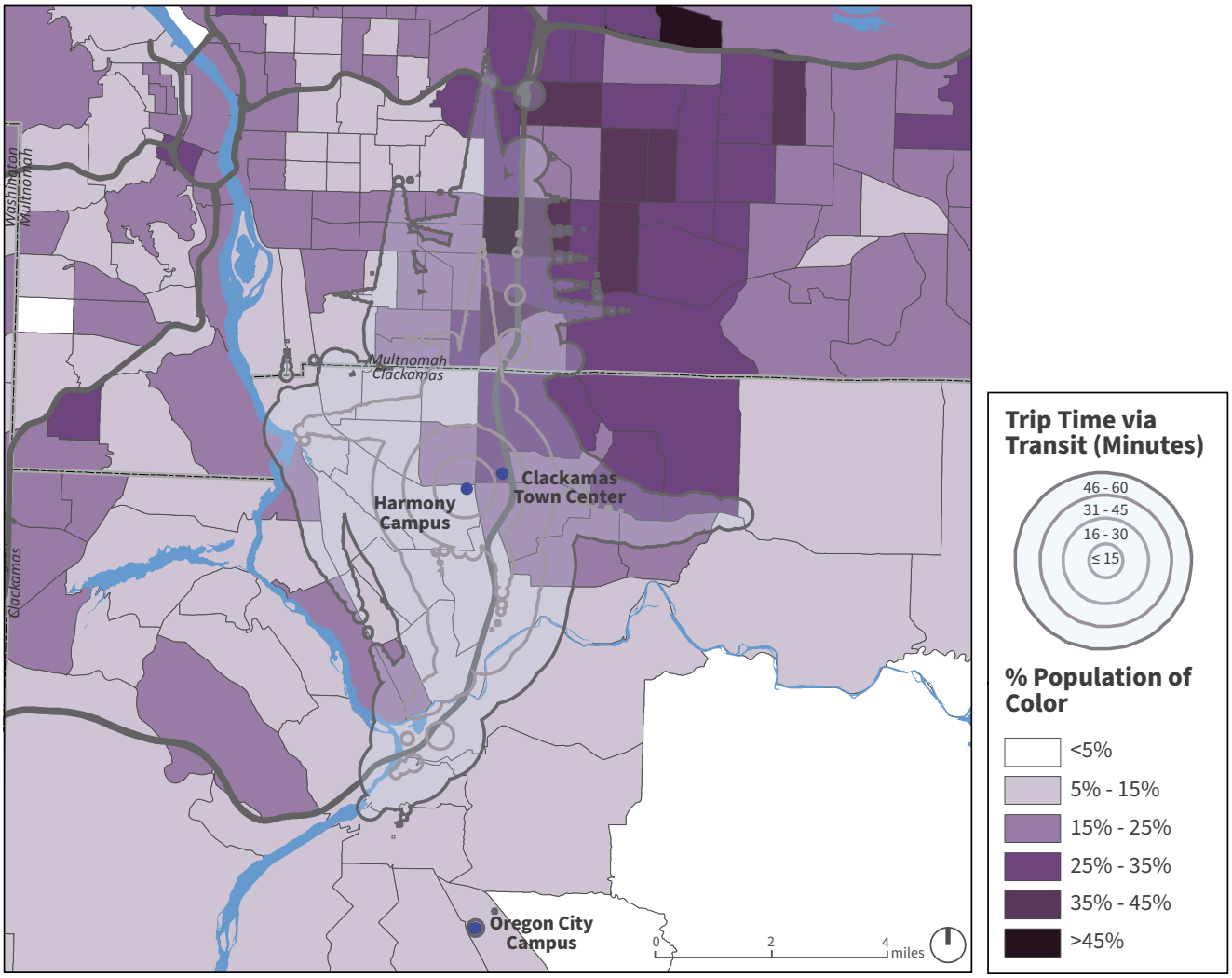
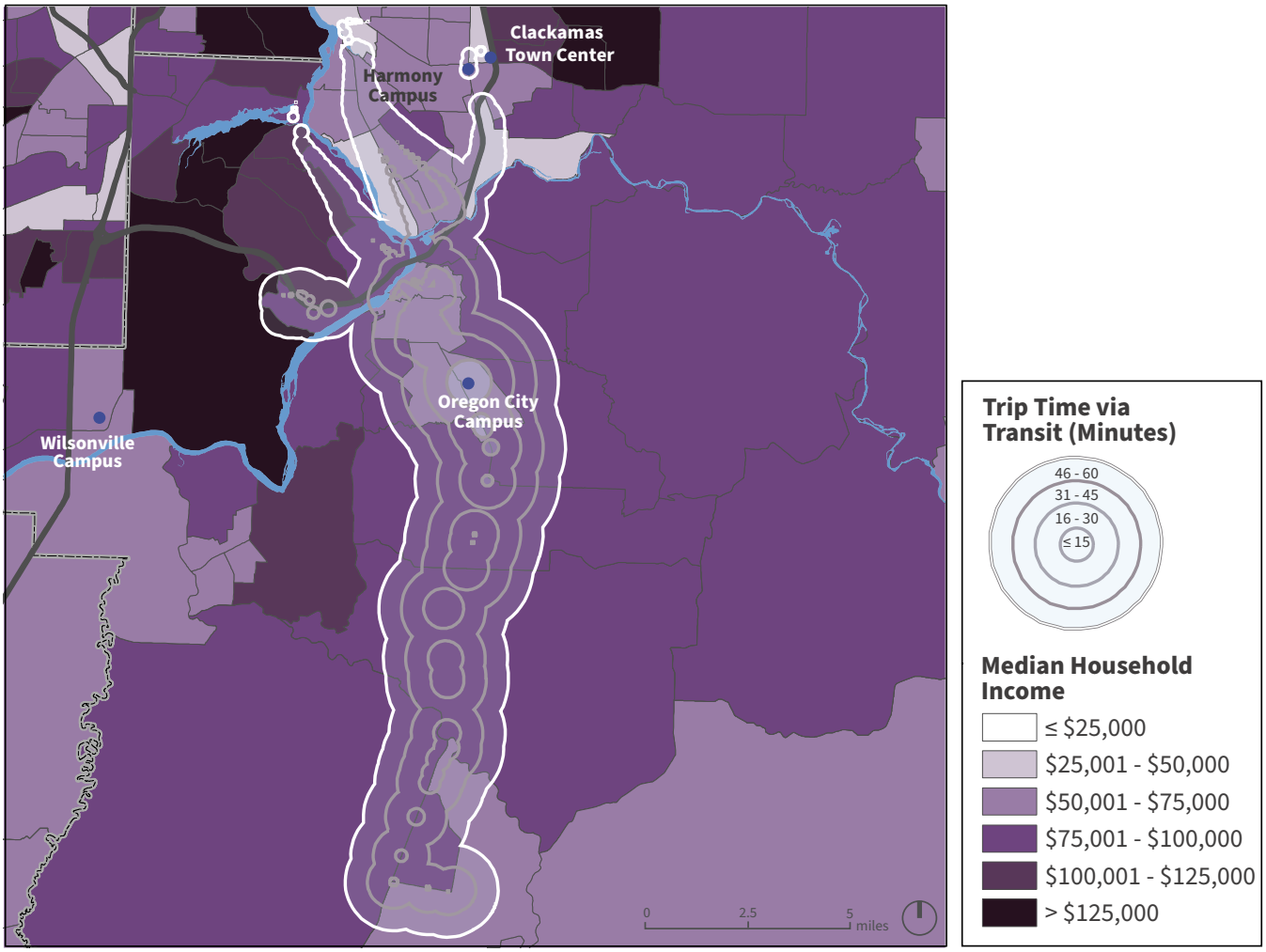

Washington
Multnomah
Multnomah
Clackamas
Clackamas
Harmony Campus
Clackamas Town Center
Oregon City Campus
0
2
4
miles
Trip Time via Transit (Minutes)
46 - 60
31 - 45
16 - 30
≤ 15
% Population of Color
<5%
5% - 15%
15% - 25%
25% - 35%
35% - 45%
>45%

Figure 5.2. Transit travel time to Oregon City and Harmony campuses and median household income by census tract.



Source: American Community Survey 2017 via Remix.

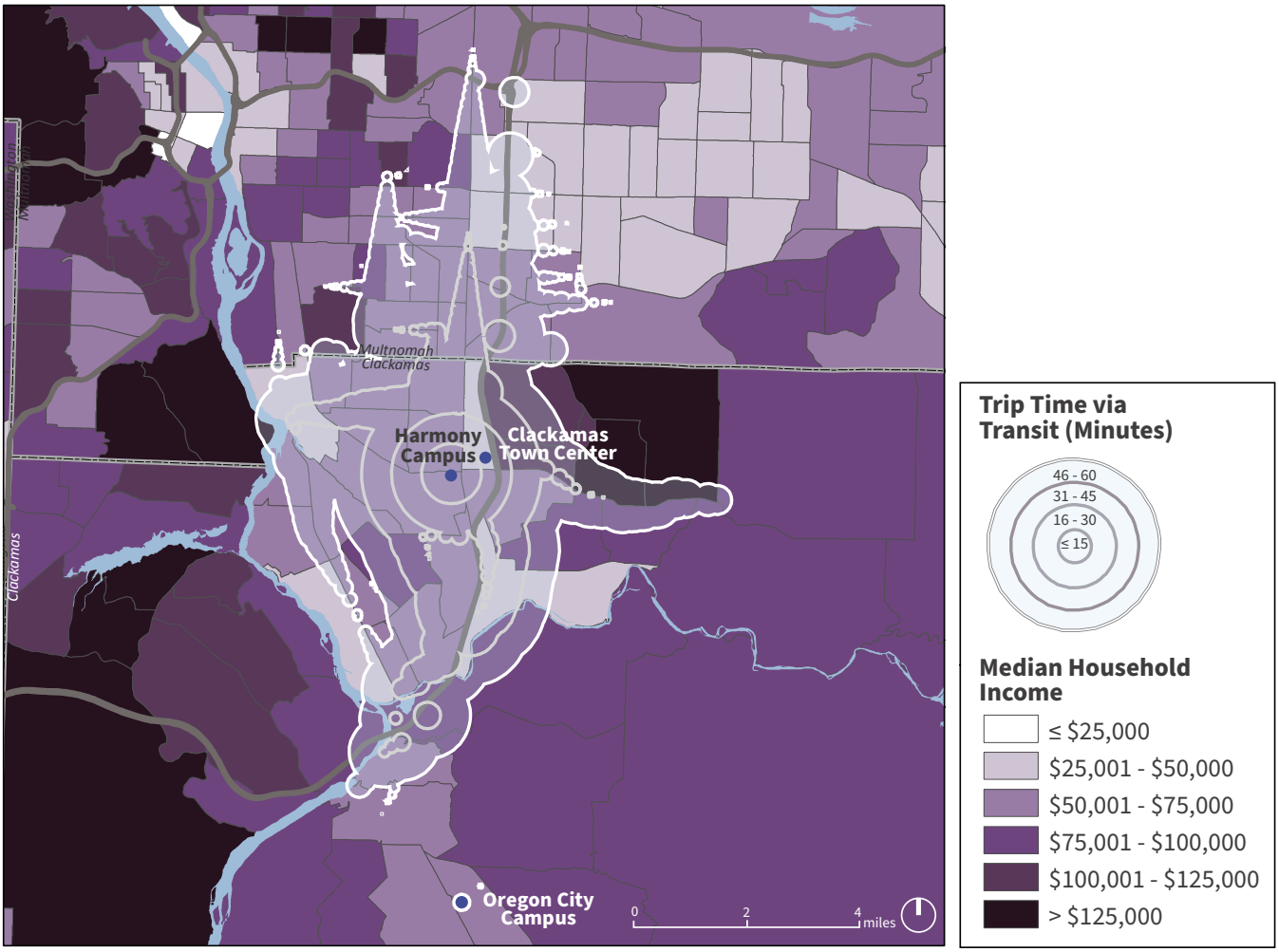
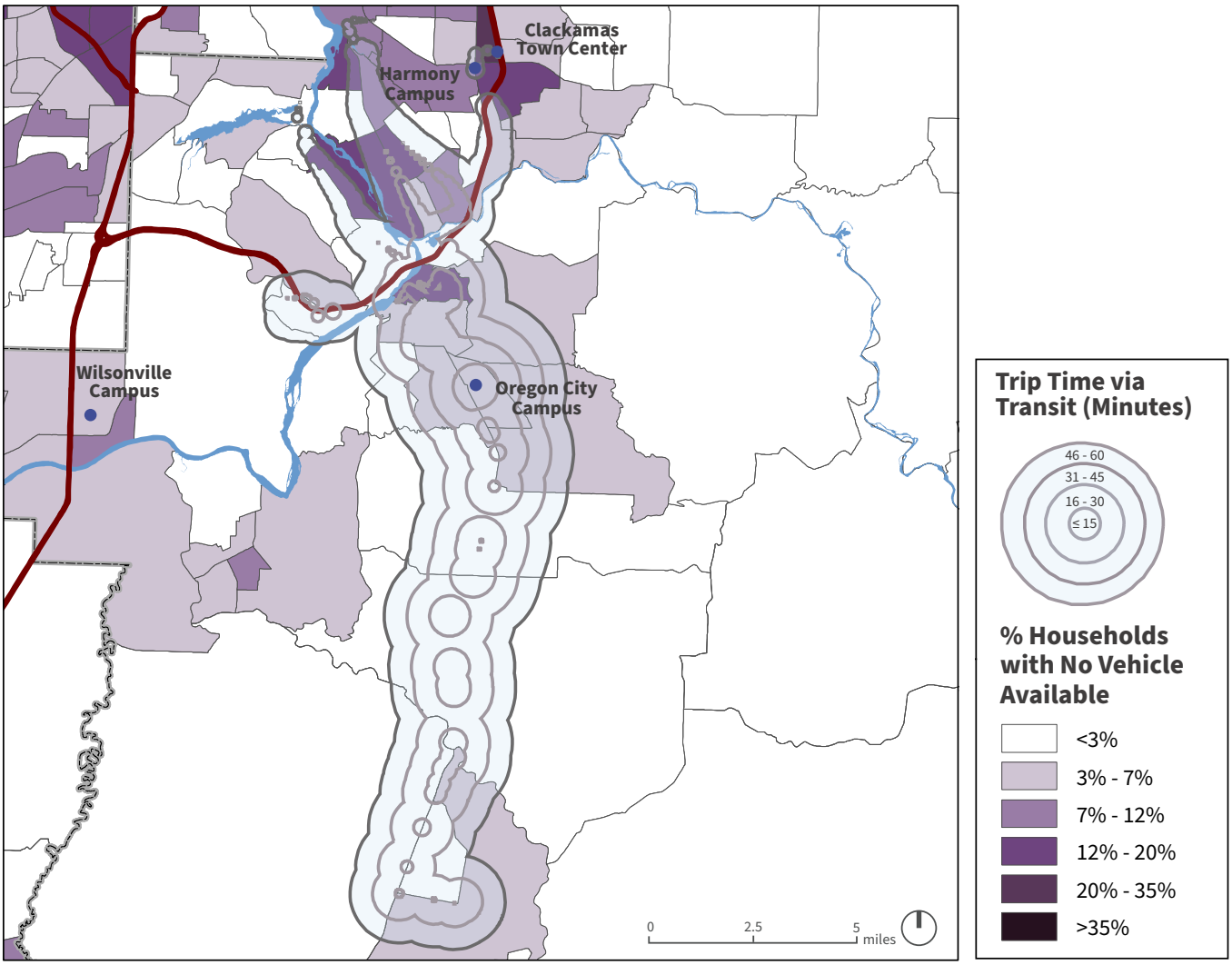
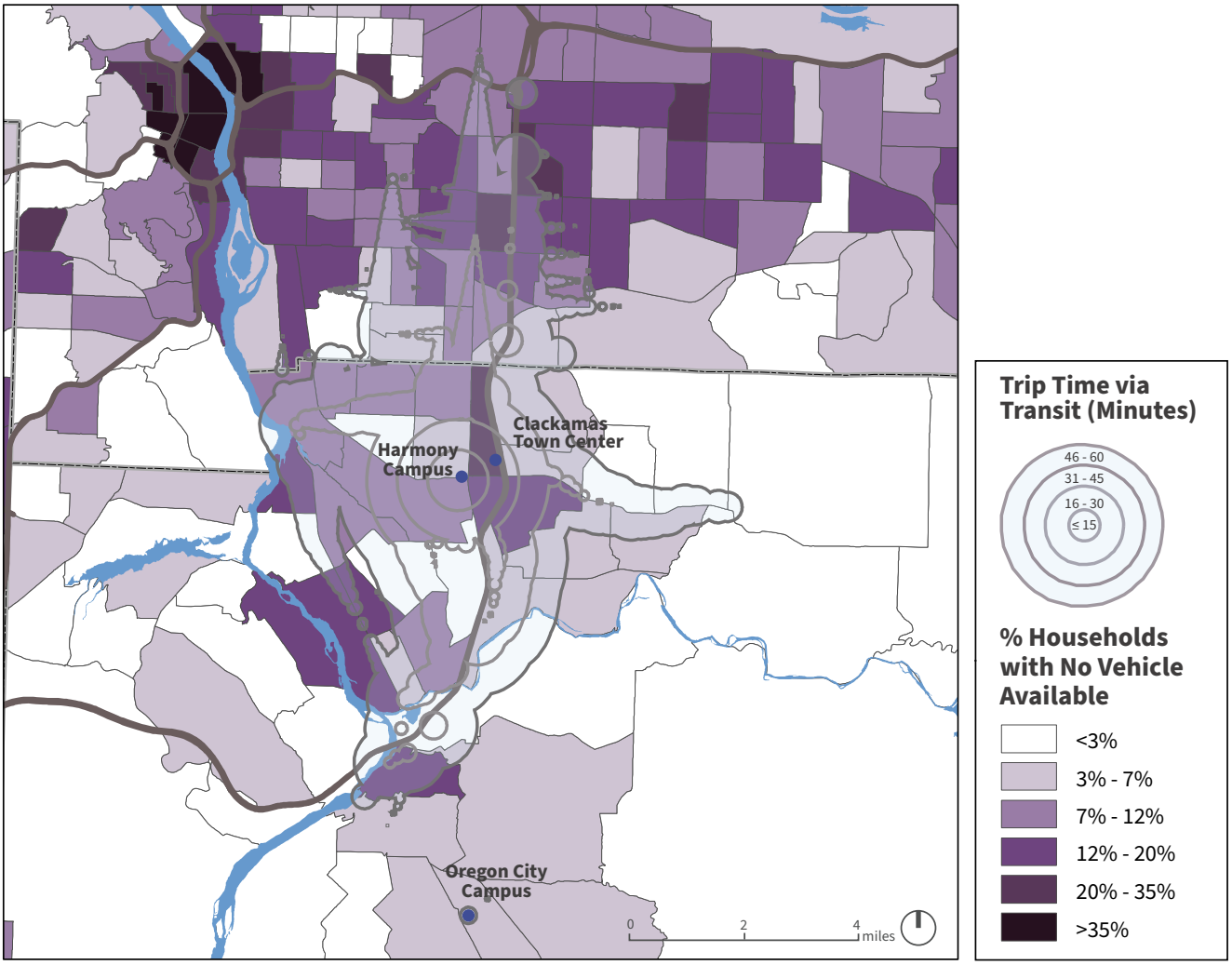

Multnomah
Clackamas
Harmony Campus
Clackamas Town Center
Clackamas
Oregon City Campus
0
2
4
miles
Trip Time via Transit (Minutes)
46 - 60
31 - 45
16 - 30
≤ 15
Median Household Income
≤ $25,000
$25,001 - $50,000
$50,001 - $75,000
$75,001 - $100,000
$100,001 - $125,000
> $125,000

Figure 5.3. Transit travel times to Oregon City and Harmony campuses and share of households with no vehicle available by census tract.



Source: American Community Survey 2017 via Remix.


Harmony Campus
Clackamas Town Center
Oregon City Campus
0
2
4
miles
Trip Time via Transit (Minutes)
46 - 60
31 - 45
16 - 30
≤ 15
% Households with No Vehicle Available
<3%
3% - 7%
7% - 12%
12% - 20%
20% - 35%
>35%

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PHOTOGRAPHY

Clackamas Community College: Cover page, pages 9, 65, 99, and 104

Shiori Azumaya: Pages 54, 60, and 85

Hennebery Eddy Architects: Pages 17, 23, and 49

Matt Tomasulo: Page 81

Google: Pages 31, 33, 38, 40, and 61

ENDNOTES

[1] The TriMet equity index combines ten factors for each block group: share of the population who are people of color, share of households with incomes below 200% of the federal poverty level, share of the population with limited English proficiency, share of the population with disabilities, share of the population older than 65 years, share of the population younger than 21 years, share of households with poor vehicle access, and access to low- and medium-wage jobs. HB 2017 Transit Advisory Committee Meeting, April 24, 2020.

[2] Oregon Executive Order No. 20-12, March 23, 2020.

[3] While CCC collects data on gender identity for internal use, we were only able to access admissions data used for federal reporting, which uses legal sex.

[4] Robert Cervero and Kara Kockelman, "Travel Demand and the 3Ds: Density, Diversity, and Design," Transportation Research Part D 2, no. 3 (1997): 199-219.

[5] Clackamas County traffic counts available at https://cmap.clackamas.us/maps/traffic. City of Portland traffic counts available at https://pdx.maps.arcgis.com/apps/webappviewer/index.html?id=7ce8d1f5053141f1bc0f5bd7905351e6

[6] All street classifications in this section are taken from Oregon Metro's Regional Land Inventory System.

[7] CCC Transportation Survey, Fall 2019.

[8] CCC Xpress Shuttle On-board Survey, Fall 2019.

[9] Precise information on student incomes was not available from CCC, but 23.4% of students received Pell Grants in the 2018-2019 academic year. CCC Institutional Research, Student Profile, accessed at https://public.tableau.com/profile/andreac#!/vizhome/CCCataGlance_0/Demographics.

[10] CCC Student Survey, 2018-2019 Academic Year

[11] 52% of respondents to the Spring 2019 Transportation Survey and 69% of respondents to the Fall 2019 Transportation Survey were aware of the shuttle.

[12] Lorelei Schmitt, Alexa Delbosc, and Graham Currie. “Learning to Use Transit Services: Adapting to Unfamiliar Transit Travel.” Transportation 46, no. 3, 1033-049.

[13] Portland State University, Transportation and Parking Services Financial Information, accessed at https://www.pdx.edu/transportation/financial-information-0

[14] Todd Litman, “Parking Pricing Implementation Guidelines,” Report for Victoria Transport Policy Institute, April 11, 2018, accessed at https://vtpi.org/parkpricing.pdf

[15] Victoria Transport Policy Institute, “Parking Costs” in Transportation Cost and Benefit Analysis: Techniques, Estimates, and Implications, 2nd ed. (Victoria, BC, 2016), https://www.vtpi.org/tca/tca0504.pdf

[16] Zheng Zhang, Hidemichi Fujii, and Shunsuke Managi. “How Does Commuting Behavior Change Due to Incentives? An Empirical Study of the Beijing Subway System.” Transportation Research Part F: Psychology and Behaviour 24, no. C (2014): 17-26, https://doi.org/10.1016/j.trf.2014.02.009.

[17] National Association of City Transportation Officials, “Shared Micromobility in the U.S.: 2018.”

[18] Texas A&M Transportation Institute, “Carpooling,” accessed at https://mobility.tamu.edu/mip/strategies-pdfs/travel-options/technical-summary/Carpooling-4-Pg.pdf

[19] Adapted from: Japan International Cooperation Agency, “Project Evaluation Guidelines,” February 2004. Accessed at https://openjicareport.jica.go.jp/pdf/11747086.pdf (in Japanese).

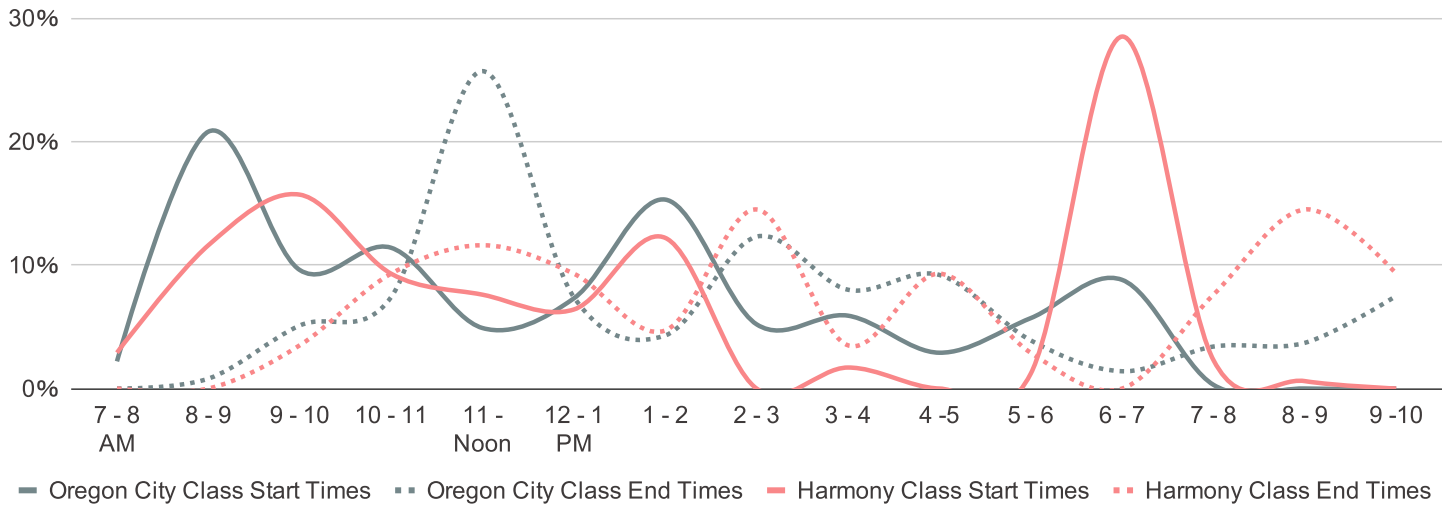
Appendix A - Travel time methodology

We used Remix, a transportation planning platform, for all calculations involving travel time by transit. Remix uses open source General Transit Feed Specification (GTFS) data available from transit agencies. CCC staff aggregated the home addresses of students registered for class at either the Harmony or Oregon City campus during Winter Term 2020 to ¼-mile cells to preserve student privacy. We joined the travel time isochrones generated in remix to this mesh of cells to calculate the share of students who live within a given travel time by transit.

Travel times by transit differ depending on the time of the day and day of the week due to variations in frequency of service and levels of congestion. For this analysis, we selected departure times to and from the Oregon City and Harmony campuses based on when the greatest number of classes started and ended (Figure A1).

Since about 30% of classes at the Oregon City campus start between 8:00 AM and 9:05 AM (Figure A1), travel time isochrones to this campus were calculated assuming a 7:00 AM weekday departure to allow for a 1-hour

Figure A1. Class start and end times at Oregon City and Harmony, Winter 2020.



transit trip to campus. Many morning classes on the Oregon City campus are dismissed between 11:00 AM and 12:00 PM, so we chose a noon departure to calculate travel time isochrones from the Oregon City campus .

The departure times to and from the Harmony campus also reflect when the most activity on campus typically occurs. At the Harmony campus, class start times peak at 6:00 PM, and these classes mostly let out between 8:00 PM and 9:10 PM.

Appendix B - Student engagement methodology

SURVEY METHODOLOGY

Prior to the outbreak of the COVID-19 pandemic, we planned to conduct two intercept surveys at the Oregon City and Harmony campuses: one for students driving to campus and another for students taking the shuttle. Students intercepted at the Harmony campus would have also received a set of questions about first/last mile options like bikeshare and scooter-share. These surveys were to be conducted during the first week of Spring Term 2020 and were also supposed to serve as a tool to recruit students for one-on-one interviews and focus groups. When the COVID-19 outbreak reached Oregon, we shifted the surveys online and combined them.

The online survey was open to all CCC students, but only those who indicated that they attended Oregon City or Harmony received the full version. The survey asked about students' access to transportation options, their travel patterns and mode choices, and the factors that influenced their decisions not to ride the shuttle. For shuttle riders, there were additional questions about shuttle service. Both Harmony and Oregon City students received questions about bike- and scootershare, but we only analyzed the responses for Harmony, since Oregon City first/last-mile solutions were out of scope. The survey also included a robust set of demographic questions to help us assess whether students of certain demographics are facing disparate challenges in their transportation to campus. To incentivize participation, we offered students the option to enter into a raffle drawing for one of three $50 gift cards. We provided students the option to be contacted to participate in one-on-one interviews as well at the end of the survey. This became our primary way of sourcing students for interviews (see *Interview Methodology* below).

The survey was disseminated via a school-wide email from the CCC transportation office on Wednesday, April 8th, which was the third day of Spring term classes for CCC students. The survey was open for twelve days. We received a total of 569 survey responses. To even out the number of respondents and make disaggregation by race, disability, and income possible, students who took classes at both campuses received the Harmony-specific version of the survey. 257 students took the Oregon City version, and 183 students, of whom 89 also took classes at Oregon City, took the Harmony version. Comparisons of the student demographics

at the Oregon City and Harmony campuses with the demographics of survey respondents can be found in Tables 1 - 4. Student household incomes for comparison were not available from CCC.

Figure B1. Race and ethnicity of survey respondents compared to the student body.

	Oregon City	Oregon City Survey	**Difference**	Harmony	Harmony Survey	**Difference**
White	60.5%	67.4%	**6.9%**	43.4%	67.0%	**23.6%**
Hispanic or Latinx/Latino/Latina	11.6%	7.4%	**-4.2%**	17.2%	10.4%	**-6.8%**
Asian or Pacific Islander	3.5%	5.3%	**1.8%**	4.1%	5.2%	**1.1%**
Black or African American	1.9%	1.6%	**-0.3%**	1.9%	2.6%	**0.7%**
American Indian or Alaskan Native	1.0%	1.1%	**0.1%**	0.7%	0.0%	**-0.7%**
Multiple Races	4.5%	14.2%	**9.7%**	4.3%	8.7%	**4.4%**
Declined to Answer	16.9%	3.2%	**-13.7%**	28.4%	6.1%	**-22.3%**

Figure B2. Age of survey respondents compared to the student body.

	Oregon City	Oregon City Survey	**Difference**	Harmony	Harmony Survey	**Difference**
<18 years old	4.2%	10.2%	**6.0%**	4.7%	38.2%	**33.5%**
18 - 21 years old	30.8%	54.1%	**23.3%**	25.7%	31.8%	**6.1%**
22 - 29 years old	23.2%	18.3%	**-4.9%**	23.7%	13.5%	**-10.2%**
30 - 39 years old	16.4%	9.2%	**-7.2%**	20.3%	9.9%	**-10.4%**
40 - 49 years old	10.1%	4.7%	**-5.4%**	14.3%	5.4%	**-8.9%**
50 - 64 years old	10.5%	2.5%	**-8.0%**	9.7%	0.9%	**-8.8%**
>64 years old	4.9%	0.5%	**-4.4%**	1.6%	0.0%	**-1.6%**

Figure B3. Gender of survey respondents compared to the student body.

	Oregon City	Oregon City Survey	**Difference**	Harmony	Harmony Survey	**Difference**
Male	51.6%	32.3%	**-19.3%**	36.8%	22.4%	**-14.4%**
Female	47.7%	61.5%	**13.8%**	62.6%	72.4%	**9.8%**
Other	0.6%	6.2%	**5.6%**	0.7%	5.2%	**4.5%**
Non-binary, gender-queer, gender fluid, or third gender	*Not asked*	*2.6%*		*Not asked*	*0.0%*	
prefer to self-describe	*Not asked*	*0.5%*		*Not asked*	*0.9%*	
Pefer not to say	*0.6%*	*3.1%*	***2.5%***	*0.7%*	*4.3%*	***3.6%***

Note: The data for the student body comes from applications to CCC, which ask for legal sex, so the numbers are not strictly comparable.

Figure B4. Disability status of survey respondents compared to the student body.

	Oregon City	Oregon City Survey	**Difference**	Harmony	Harmony Survey	**Difference**
	4.9%	11.3%	**6.4%**	3.2%	9.7%	**6.5%**

Note: The survey asked specifically about mobility-related disabilities, while the numbers CCC reports are for students who "received a certain level of service due to a permanent disability."

INTERVIEW METHODOLOGY

Our second student engagement method consisted of one-on-one student interviews conducted by phone or video call. Interviews provided an opportunity to gather qualitative data on students' transportation experiences and an avenue for students to bring forth important aspects of their transportation experiences that cannot be adequately gathered from a survey. Keeping in mind that surveys are a dominant culture engagement method which tend to over-represent responses of white, affluent, cis, and able-bodied folks, we focused our interview outreach and recruitment towards students of often underrepresented demographics.

Students were recruited to interview in three main ways. First, we contacted a number of student groups, resource centers, and student programs that carve out spaces for students from historically marginalized communities:

Student groups

- Black Student Union
- Latinx Student Union, also known as Unidos Club
- Asian, Pacific Islander, and Desi Association
- American Sign Language Club
- Gender and Sexuality Alliance

Resource Centers

- Disability Resource Center

Student Programs

- Spanish-Language GED Program
- English as a Second Language Program

Many of the student groups were inactive or just forming, with very small memberships. We provided background information about the project and said we were interested in interviewing students who have in the past or are currently taking the shuttle or transit to campus. Some groups reported that none of their active students take these forms of transportation to campus. This outreach resulted in three student interviews. We reached out directly to the Spanish-language GED program and the English as a Second Language Program through the program directors in an effort to engage students who speak Spanish as their primary language and conduct interviews in Spanish. However, we did not receive any interest in interviewing from students in either of these two programs however.

The second primary outreach method was with the support of the Transportation Office at CCC, who emailed student respondents from the Fall 2019 shuttle survey with information about our survey and the opportunity to interview. The Transportation office then put us in contact with students who volunteered to be interviewed.

The third recruitment method for student interviews was through our survey, where students had the option of indicating whether they were interested in being interviewed. From the survey respondents who volunteered to interview, we pulled contact information for students who indicated they were any of the following: low income (≤$25,000/year), non-white, had a disability, had children, identified as trans, non-binary, or questioning of their gender identity, or spoke a language other than English as their primary language. The majority of our student interviews came from this recruitment method.

We conducted a total of 20 one-on-one student interviews from mid-March to late April. To incentivize participation and as an acknowledgement of the time and labor students give in this extractive form of engagement, we offered $15 gift cards to all participants. We asked students about their transportation modes, routes, opinions about their commutes and mode, and how their transportation to school affects their educational experience at CCC. At the end of the interview, students were given the opportunity to provide additional comments or suggestions.

Student interview questions

1. How did you hear about this project?
2. Tell me about how you get to CCC
    a. Which campus/es do you attend? Which campus do you spend the most time at?
    b. How long is your commute?
    c. What modes of transportation do you use and why?
3. What is the most frustrating or challenging part about getting to CCC for you, if any?
    a. Have you had any safety or accessibility concerns?
    b. In what ways do you feel these challenges have affected your educational experience at CCC, if at all?
4. What would make your trip to CCC easier or more convenient?
    a. How do you feel these changes would impact your educational experience at CCC, if at all?
5. Are there other students or student groups with similar transportation experiences that you think we should connect with?
6. Any other comments, suggestions you'd like to add?

Most interviews were 25-30 minutes long. Since students were learning remotely this term, interviews focused on past experiences traveling to school. Interviewees attended the Oregon City campus, the Harmony campus, or both. A majority of student interviewees were transit/shuttle reliant, but we interviewed students who used other modes of transportation as well to get a better understanding of the reasons they took that mode.

Mode split of interviewees:

- Students who took transit/shuttle first then started driving exclusively : 4
- Students who take a combination of transit/shuttle/ride/borrowing car to drive/getting a ride: 14
- Students who exclusively walk to campus: 1
- Students who have only driven to campus: 1

Appendix C - Performance measures

Sample annual performance worksheet

Project name	
Overview and progress this year	
Strategy	
Performance measures	
1.	
2.	
3.	
Other information	

Evaluation

Is the project responsive to student needs?	
What is the impact of the project on priority populations?	
What is the increase in access to CCC associated with the project? What are the cost savings?	
Continue project? (Reasons, if necessary):	
Changes?	
Are the performance measures still appropriate?	
Performance measures for next year:	

List of recommended actions with performance measures and collection methods.

Performance measures with an "✓" in the column labeled "Disaggregate" should be collected along with demographic information and disaggregated for each priority population.

				Methods		
#	Action	Performance measures	Disaggregate	Existing survey	Interview	Other
1.1	**Increase shuttle frequency**	Share of students who ride the shuttle	✓	✓		
		Student wait times at shuttle stops				Average headway
		Share of students who say shuttle overcrowding is a problem	✓	✓	✓	
		Number of riders who are left behind at shuttle stops				Collected by vendor
1.2	**Move Harmony stop to north parking lot**	Share of Harmony students who use the shuttle	✓	✓	✓	
1.3	**Stop at CTC in both directions**	Share of students at each campus who use the shuttle	✓	✓	✓	
1.4	**Pilot new shuttle stops near harmony or Oregon City**	Number of students who use new stops	✓	✓		Collected by vendor
		Share of students who ride the shuttle	✓	✓		
1.5	**Schedule gas fill-ups when riders are not on board**	Number of times that drivers fill up gas tanks on the route		✓		Collected by vendor
2.1	**Install additional wayfinding**	Share of students who are aware of the shuttle	✓	✓	✓	
		Share of students who are aware of the shuttle at the end of their first term	✓	✓	✓	

#	Action	Performance measures	Methods			
			Disaggregate	Existing survey	Interview	Other
2.2	**Provide shuttle information in more languages**	Share of students whose primary language is not English who are aware of the shuttle		✓	✓	
		Share of students whose primary language is not English who use the shuttle		✓	✓	
		Number of page views for CCC website pages with shuttle information in languages other than English				Page views
2.3	**Promote shuttle to faculty**	Share of students who are aware of the shuttle	✓	✓	✓	
		Share of students who are aware of the shuttle at the end of their first term	✓	✓	✓	
		Number of times the Transportation Office promotes the shuttle to faculty				Count
2.4	**Distribute example trip plans**	Number of page views for CCC website pages with shuttle information				Page views
		Share of students who live in areas for which trip plans exist who are aware of the trip plans	✓	✓	✓	
3.1	**Improve stop amenities at Harmony**	Share of students who feel safe waiting for the shuttle	✓	✓	✓	
3.2	**Improve driver feedback loop**	Share of students who feel safe riding the shuttle	✓	✓	✓	
		Share of student reports that the Transportation Office or shuttle vendor follows up on	✓			Count (shuttle vendor or Transportation Office)

#	Action	Performance measures	Methods			
			Disaggregate	Existing survey	Interview	Other
4.1	**Expand the parking enforcement program**	Number of carpool parking spot violations				Count (Parking enforcement)
		Number of parking violations at the north parking lot at Harmony				Count (Parking enforcement)
		Number of times the shuttle is delayed due to unauthorized parking				Count (shuttle vendor)
4.2	**Price parking**	Share of students who drive alone to campus	✓	✓		
		Number of open parking spots at peak demand				
5.1	**Remove GPA requirement for bike rental program**	Number of rentals	✓			Count (program)
5.2	**Make bike rental program free**	Number of rentals	✓			Count (program)
5.3	**Start a build-a-bike program**	Number of students who are aware of the program	✓	✓	✓	
		Number of students who participate in the program	✓			Count (program)
		Number of students who commute by bike after the program	✓	✓	✓	Program follow-up survey

#	Action	Performance measures	Methods			
			Disag-gregate	Existing survey	Inter-view	Other
5.4	**Hold a Spring Term Bike Challenge**	Number of students who participate in the program				Count (program)
		Number of students who say that they will commute by bike or walk after the Spring Challenge	✓			Program follow-up survey
		Share of students who are aware of bike-related programs at CCC	✓	✓		
5.5	**Pilot scootershare at Harmony**	Share of Harmony students who use the program	✓	✓	✓	
		Share of Harmony students who are aware of the program	✓	✓	✓	
		Share of program participants whose commute is easier because of the program	✓	✓	✓	


CONEXION
STUDIO