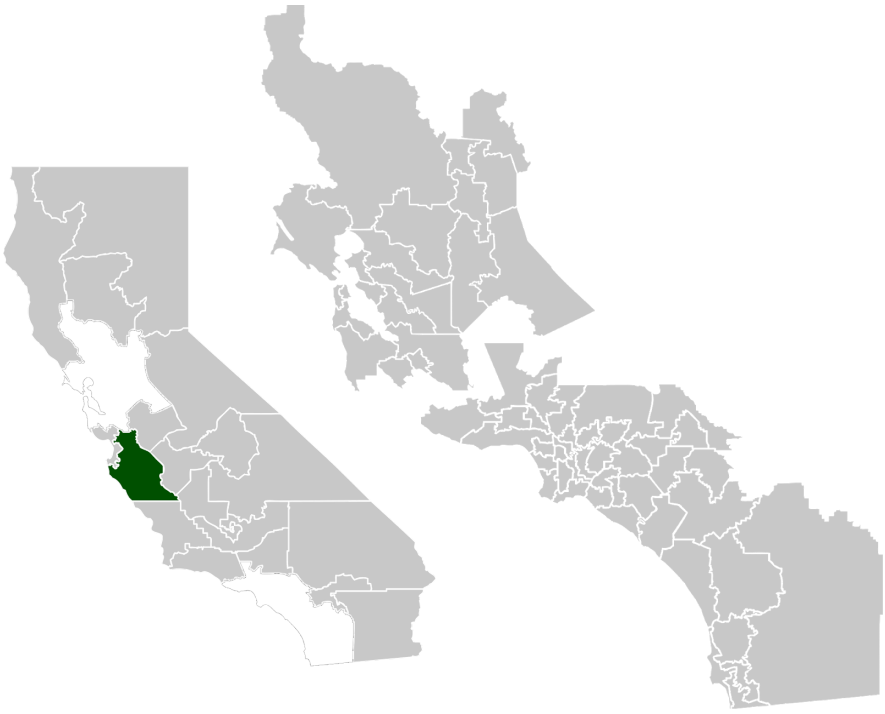
Broadband Access and Constituent Experiences Under COVID-19 Shelter-In-Place Orders: California Assembly District 30



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Cover image from https://en.wikipedia.org/wiki/California%27s_30th_State_Assembly_district

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Introduction

If a silver lining is to be found amid the immense and ongoing tragedies of 2020, it may be that the light upon some of our society's most egregious injustices became too bright to ignore any longer. Disparities in policing and police violence, generational wealth and economic opportunity, and access to well-resourced schools including digital learning tools have persistently left students of color, students learning English as a new language, students with disabilities, and students in poverty, as well as their families and communities at the margins. The year's events and subsequent mobilizations for justice and mutual aid have finally spurred notable action to address these inequities. This inquiry project and report seek to contribute to that action.

This report adds to our understanding of disparities in broadband access along racial, socioeconomic, and geographic lines across California's 30th Assembly District. In addition, this report contributes to our understanding of the challenges and opportunities experienced by students, families, workers, and other community members in District 30 through a focus on Watsonville, CA, and specifically the shift from in-person to online schooling starting in Spring 2020. Other entities have examined the issue of educational opportunity gaps, and we refer readers to their work for further elucidation. The Public Policy Institute of California has already noted that despite districts' efforts to provide technological hardware to students (Internet-enabled devices such as laptops or tablets and Wi-Fi hotspots, most often), this has not sufficiently addressed lack of consistent and reliable access to high-speed Internet with which to participate in the kinds of bandwidth-intensive activities that comprise online schooling, such as large videoconferences, collaborative editing of online documents, streaming informational content, and uploading large files of student work. Similarly, The Education Trust-West has mapped disparities between Internet access and projected need by county and school district. We also note for the reader that the state of California already faces litigation alleging that these disparities in opportunity constitute a violation of students' right to basic educational equality as set forth in Article 1, S. 200 of the state's Education Code, "It is the policy of the State of California to afford all persons in public schools...equal rights, and opportunities in the educational institutions of the state." This project builds on such efforts to provide data specific to California's 30th Assembly District.

Origins and Scope of the Project

This project originated by request of the office of Assemblymember Rivas, representative of California's 30th Assembly District. Curious as to the impacts of the known gaps in broadband access within the district, Assemblymember Rivas approached San José State University for support in

mapping these areas of need and assessing their educational impacts. Initial contacts to the Department of Urban and Regional Planning within the College of Social Sciences could yield maps showing differences between available network capacity and population in different zones within the district, but faculty members from the Connie L. Lurie College of Education (LCOE) were brought in later in the work to assess students' actual educational experiences and those of community members under such conditions. Given prior acquaintance between LCOE faculty and teachers at Watsonville High School's Education, Community, Humanitarian Outreach (ECHO) Leadership Program, as well as the ECHO program's commitments to community-engaged learning, the project proceeded as a case study of experiences within one community in the district and through student-engaged action inquiry. Consistent with ECHO's focus on empowerment, initiative, and leadership, students set about to document their own, their peers' and relatives', and community members' experiences related to broadband access, under COVID-19 conditions.

Inquiry Process

The data collection process began in October in dual strands. Prof. Zandiatashbar undertook the effort to map and analyze broadband access in the district, and in total, 175 students learning with five separate teachers conducted interviews of classmates, family, relatives, or other acquaintances. Students, with the support of their teachers, designed interview protocols to capture the experiences of community members with broadband access, with a particular focus on education, before and after the shift to remote schooling (see Appendix A for the interview protocol and student assignment instructions). Given the risks of the ongoing pandemic and the primacy of protecting student privacy, WHS students could opt to only interview members of their immediate household and to conduct their interviews fully online. Moreover, students could opt to withhold their interview recordings from SJSU faculty for the purposes of this report and apply them only to their schoolwork if they so chose. Over 350 separate interviews were conducted, of which a random sample of 60 were transcribed and analyzed thematically to identify patterns in Internet access and educational experiences both before and after the transition to online schooling.

Summary of Key Findings

- **Reported broadband access in District 30 is haphazard and inequitably distributed, with low-income communities of color most impacted.**
  Whereas the northern portion of the district is generally "Well-Served" in its broadband infrastructure (at least three Internet Service Providers, with reported availability of download speeds of up to 25 mbps and upload speeds of 4 mbps by ISPs in the area), there are sizeable pockets of the district lacking this baseline (refer to Figure 1), including regions with sizeable student populations (refer to Figure 2). These disparities in access disproportionately harm low-income households and people of color within the district (refer to Figure 3).

- **Baseline broadband infrastructure is not sufficiently predictive of stable access for remote schooling.**
  Interviews demonstrated that even the presence of broadband infrastructure did not guarantee consistent access sufficient for schooling given prohibitive costs of high-speed service for some households or extensive simultaneous Internet usage in a household (e.g.: multiple children attending virtual school at the same time, adults working from home online while children attended virtual school) that overly taxed household network capacity.

- **Online schooling is severely hindered by lack of reliable Internet access.**
  Student interviews describe myriad challenges to online learning with limited broadband. Accessing content becomes difficult when video and audio to teachers or streaming materials freeze or stall due to connectivity issues. Participation in the form of asking questions, responding to teacher or peer comments, or submitting work is complicated by stalled videoconferencing or slow uploads. Indirect challenges to students' learning also emerged from the interviews, most notably increased economic insecurity in the household when limited Internet connectivity hindered adults' ability to work consistently (e.g.: online retail sales for family-owned and independent small businesses).

- **Students and teachers are resilient and adaptive.**
  Despite widespread inequities and challenges, learning continues as students demonstrate perseverance (finding alternative locations with better Internet access, and ways to access school content or submit assignments) and seek out additional support. Likewise, teachers are holding additional office hours, providing flexible assignment options, attending to students' social and emotional wellness, and connecting students to resources in unprecedented ways.

Broadband Coverage in District 30

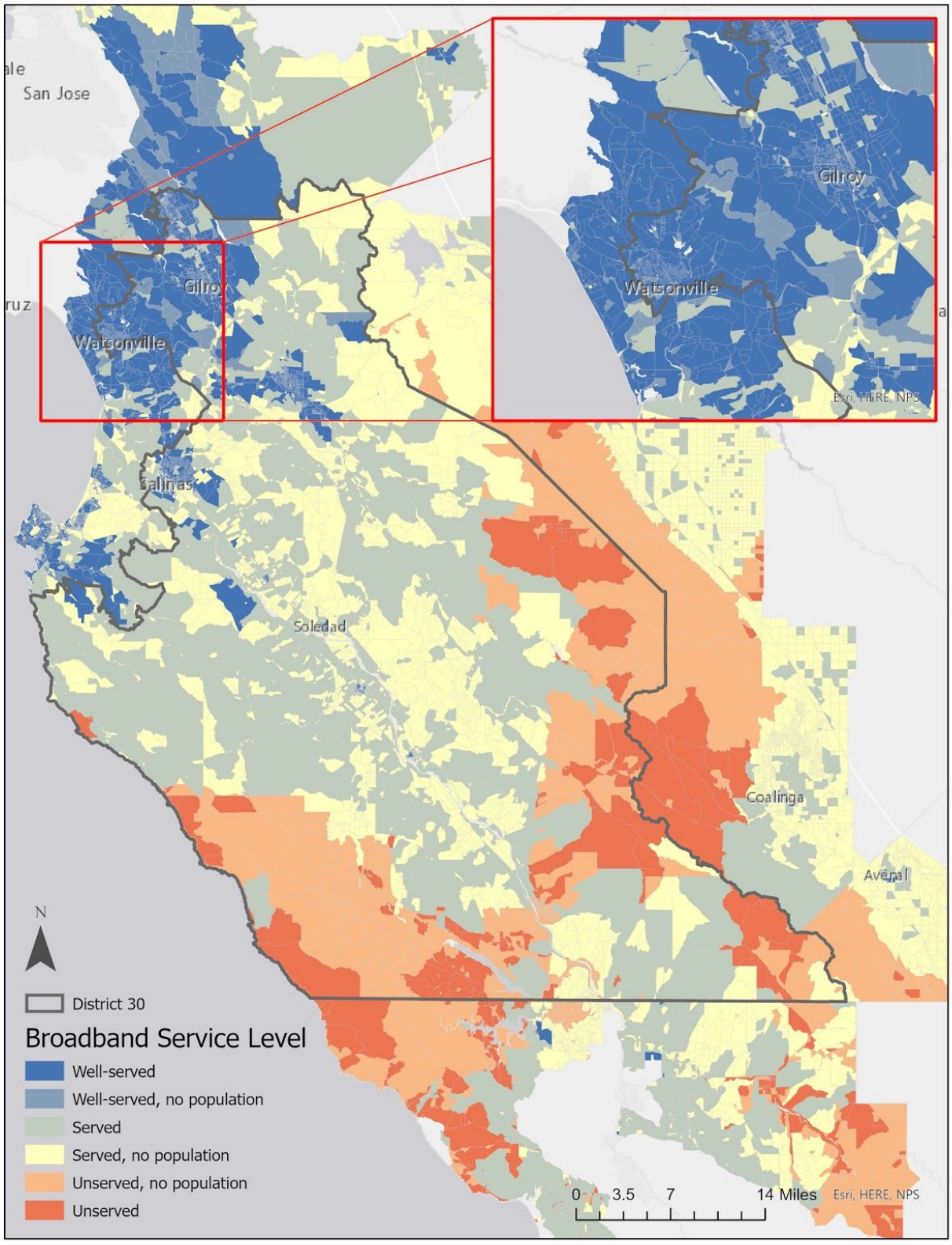
The figures in this section demonstrate the extent of broadband infrastructure in the district and the alignment of that infrastructure with concentrations of overall population, school-aged population, as well as racial and socioeconomic characteristics. Figure 1 below shows the consumer broadband service level in every census block[1] (neighborhood) in CA District 30, depicting the vast disparities in broadband infrastructure within the district.

The methodology for categorizing broadband service level is based on the number of providers and speeds available (Herries, 2020) through Fixed Broadband deployment Data released by the Federal Communication Commission (FCC). Hence, to be rated as "Well-served," a census block must be supported by at least three providers, all of which should provide service at or above 25 Mbps download / 3 Mbps upload. The "Unserved" census blocks either have no providers, or the provided services are all below the 25 Mbps download / 3 Mbps upload minimums. All other blocks are rated as "Served," which basically include 1) blocks with a mix of services above and below the 25 Mbps download / 3 Mbps upload threshold, and 2) blocks with only one or two providers but at least one provider above the 25 Mbps download / 3 Mbps upload threshold. Ultimately, areas rated as “served” could be considered “underserved” as well given the basic speed and limited number of providers that serve these areas.

We also integrated population data in our mapping, given the fact that these services are meant to support residents. The population data is obtained from the United States Census Bureau, representing the number of residents in 2010. It is noteworthy that Both “served” and “unserved” areas require specific attention; particularly if they are home to residents. Hence, while the southwest and southeast of District 30 are not served by any providers, the majority of these areas have a low population size. On the other hand, the major cities of this district could also suffer from limited service. For instance, the suburbs of Salinas and Gilroy are marked “served,” implying that only one provider supports these areas with the basic speed. Our data also shows a similar situation in central areas and suburbs of Watsonville where, according to The Education Trust-West and confirmed by our own analysis below, there is a relatively strong presence of students who are in need of proper broadband access.

[1] A census block is the smallest geographic unit that the United States Census Bureau uses for tabulation of 100-percent data. Census blocks are grouped into block groups, which are grouped into census tracts. The granularity level of blocks often comes with the data limitation, for instance socioeconomic factors or racial attributes are not released at this level which requires aggregation of block level data to census tract.

Figure 1: Broadband Service Level (Analysis at Census Block Level)



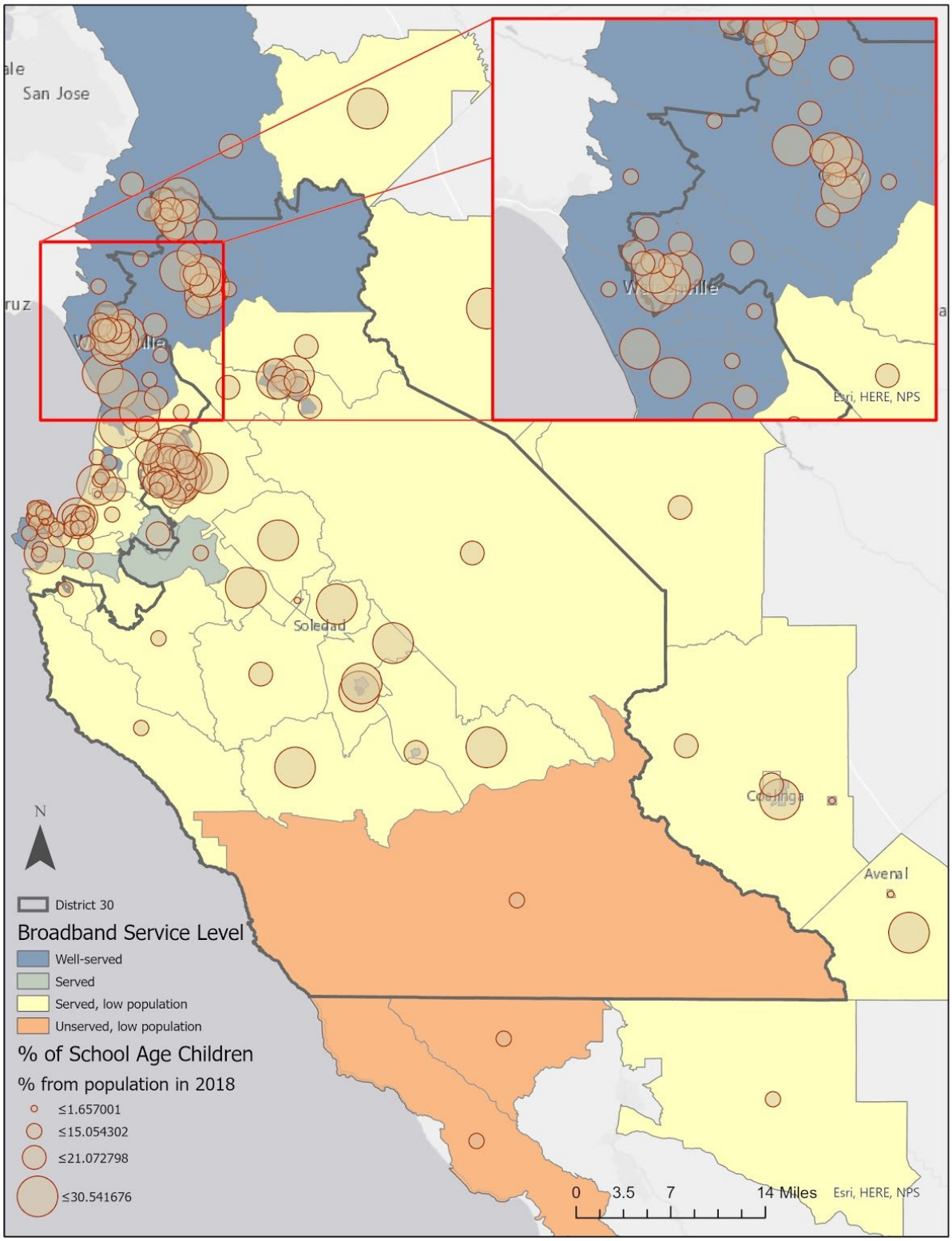
Infrastructure Relative to Concentrations of Student-Aged Population

Figure 2 illustrates a supply and demand comparison. Due to data constraints (see Footnote 1) we aggregated our broadband service level information to the unit of analysis for which we could collect other factors. Hence, Figure 2 provides information at a more aggregated level (census tract) compared to Figure 1. In this map, the focus is to visualize the presence of school age children across District 30. Figure 1 showed southern parts of the district, which are home to few residents, suffering from lack of service while more populated areas like the suburbs of Salinas and Gilroy and central areas of Watsonville are marked as "served" areas.

We remind the reader that in contrast to the availability of multiple providers that support high speed service in the north and outside of the district, the served areas are limited to one provider with lower speed. It is thus concerning when figure 2 shows school age children[2] are clustered in these "served" areas. In sum, according to both maps, most of District 30 is not well-served and there is a clear clustering pattern where most of the southern part is unserved and the rest of the district has just a basic level of service.

[2] According to school age resources provided by Stanford university, school age is considered 5 years old to 18 years old.

Figure 2 - Broadband Service Level and % of School Age Population at Census Tract Level. Inset focuses on Watsonville Area.



Racial/Ethnic and Socioeconomic Disparities in Broadband Access

As noted in Figures 1 and 2, the further south one goes within District 30, the more sparse broadband access becomes. This pattern coincides with decreasing concentrations of non-Hispanic white residents. Figure 3 shows relative Hispanic/Latino population share at the census tract level, and we note that the district overall is home to residents of whom over 66% identify as Hispanic/Latino, and that over 80% of the child population in the district is Hispanic/Latino, both of which are higher than the California statewide averages. Thus, it is essential to note that the disparities in broadband access perpetuate racialized opportunity gaps within the district and the state. As shown in Figure 3, Salinas, Watsonville, Marina and San Juan Bautista cities are home to a higher share of Hispanic/Latino in district 30; all of which are served with a basic broadband service level or in other words marked as "served areas".

Figure 4 shows the location of African-American population at the census tract level in district 30, vis-a-vis the broadband service level. Quite similar to Hispanice/Latino population, Watsonville, Salinas and Marina cities are home to a higher share of African-American population. Also Figure 4; which is developed using the American Community Survey 2018 data provided by the Census Bureau, shows a notable share of African-American residents living in Soledad city, the central part of the district. However; Soledad is not also "well served" in terms of broadband service. It is noteworthy that nearly 40% of Soledad residents are also Hispanic/Latino; according to Data USA.

Lastly, Figure 5 shows the spatial discrepancy of poverty across the district using the American Community Survey 2018 data. This map emphasizes the need for a specific attention on the major cities of District 30; Salinas, Watsonville, and Marina. The highest share of residents living in poverty are found to be in Watsonville and Salinas. Among all of the census tracts, our spatial analysis shows central areas of Watsonville, Salinas and Seaside cities are notable in terms of share of residents in poverty; where this share could be as high as over 45% of residents in a census tract. Adding the broadband service level layer to this figure depicts what we note earlier; the disparities in broadband access perpetuate income opportunity gaps between residents of the district.

Figure 3 - Broadband Service Level and % of Hispanic Population at Census Tract Level. *Inset focuses on Watsonville Area.*

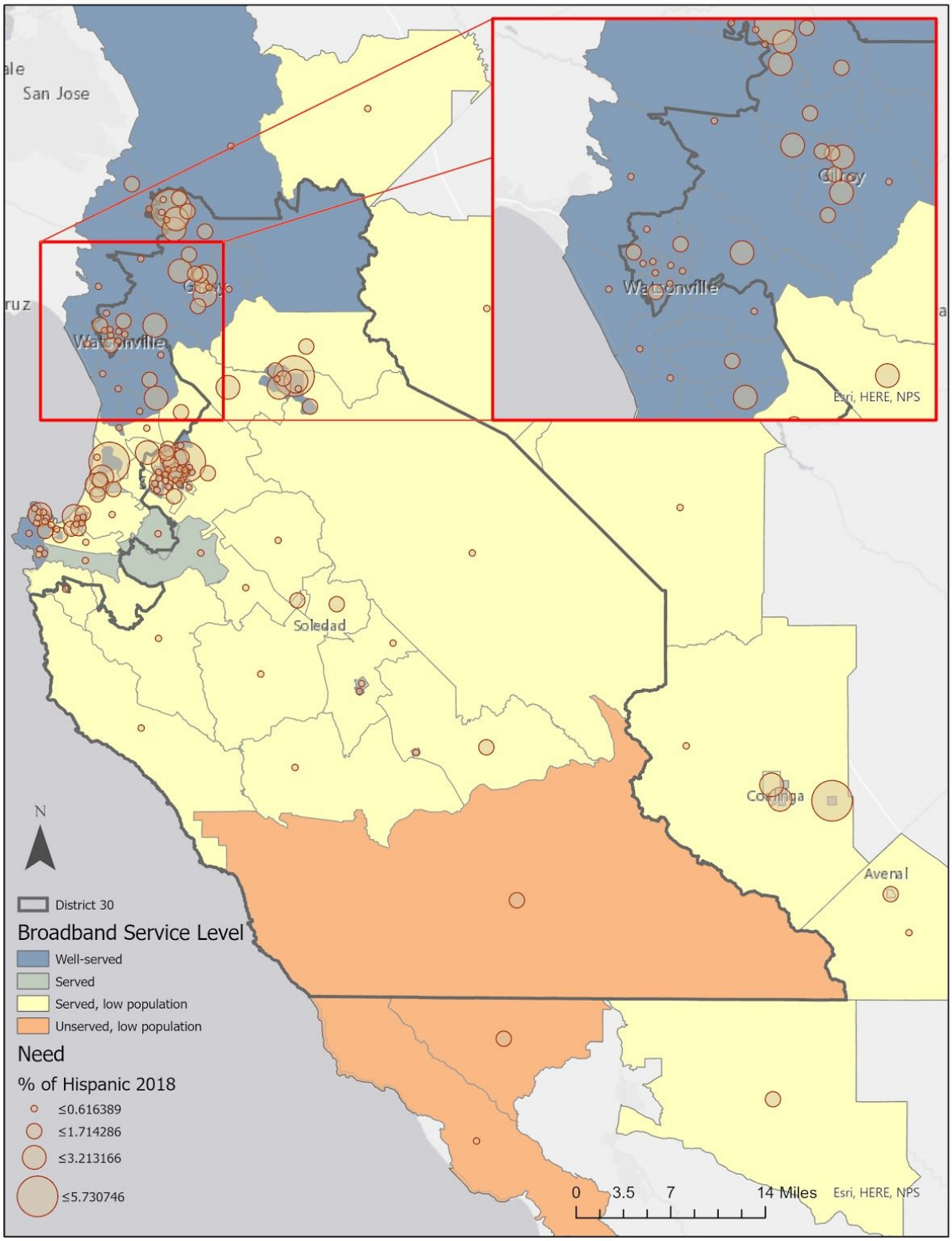


Figure 4 - Broadband Service Level and % of African-American Population at Census Tract Level. *Inset focuses on Watsonville Area.*

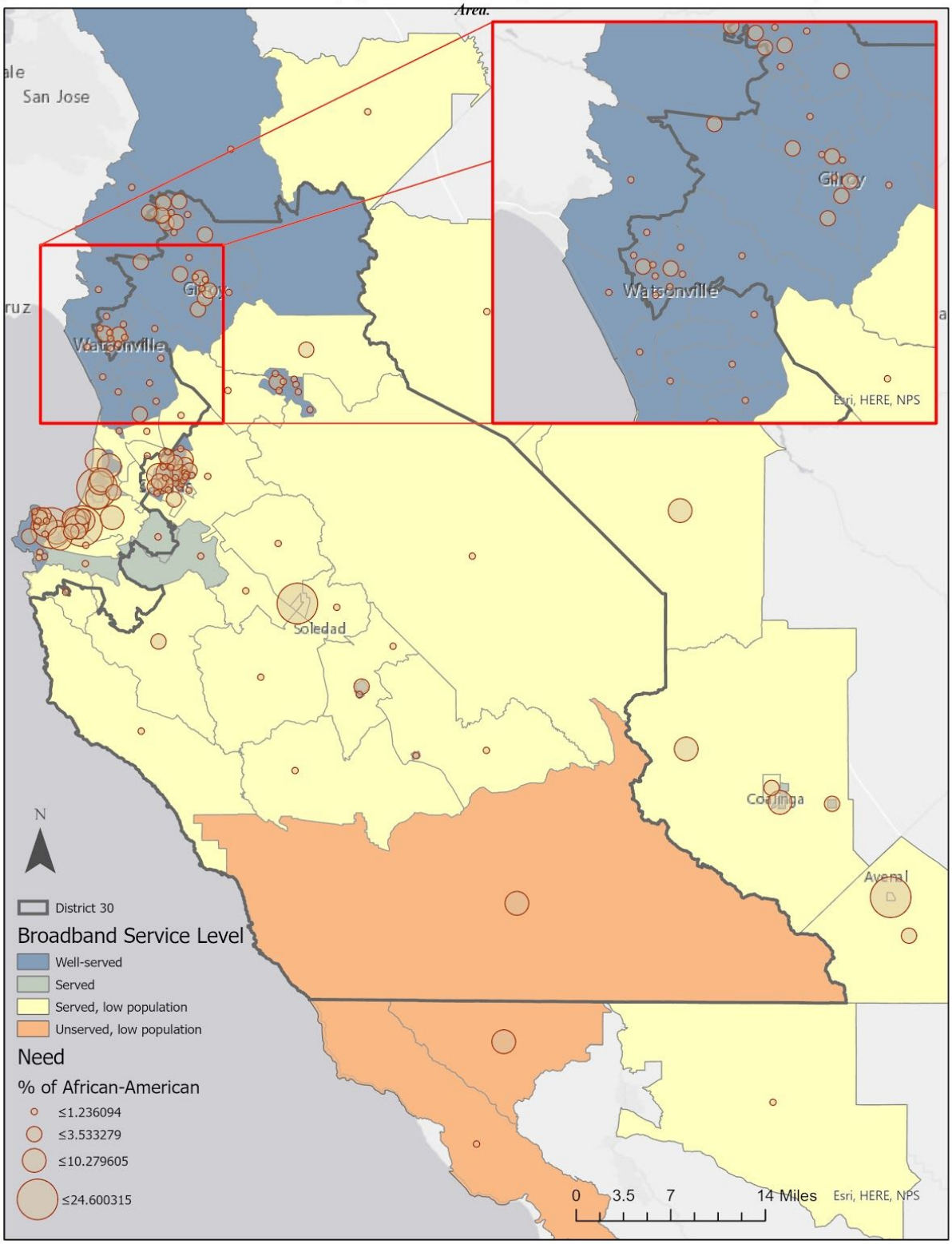
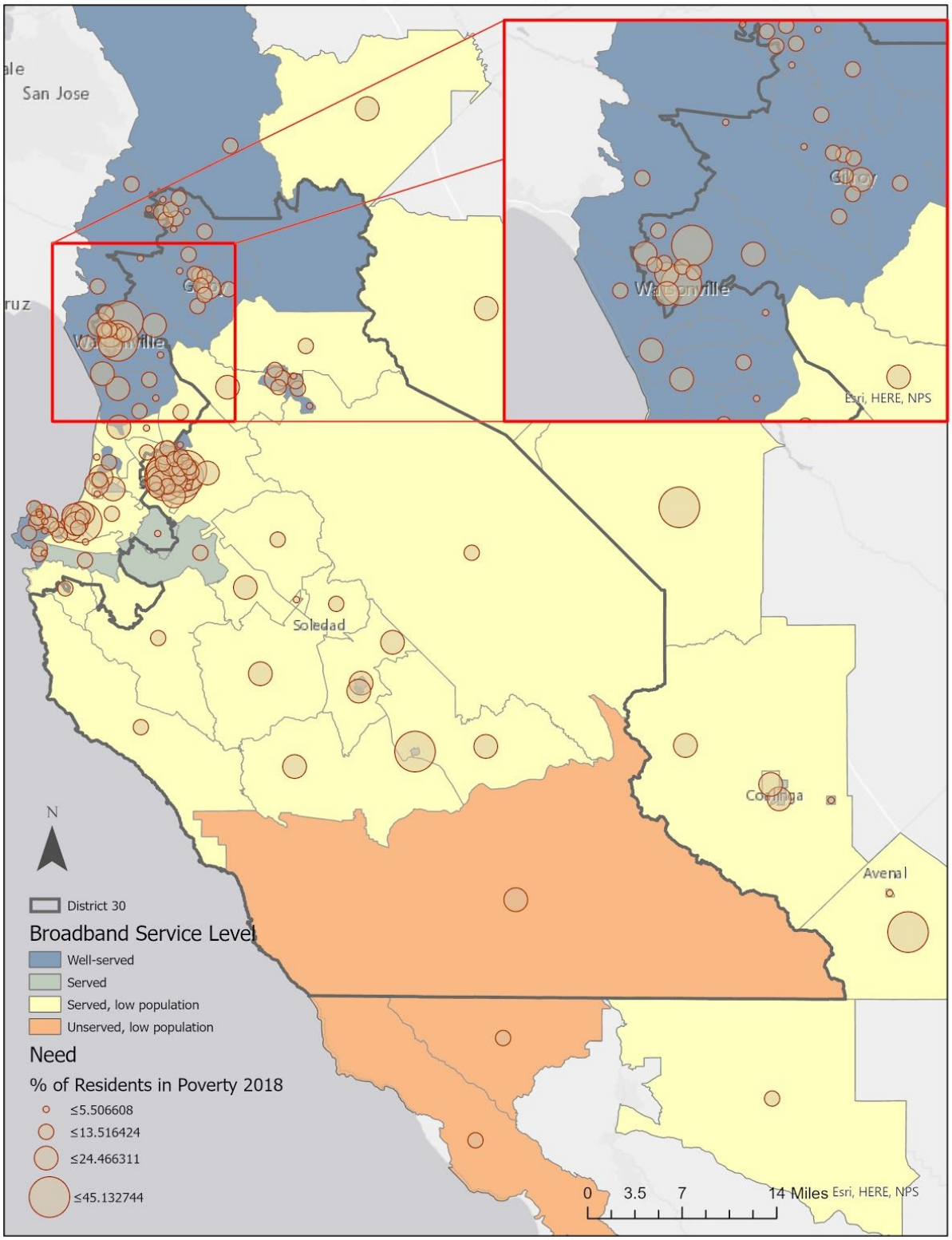


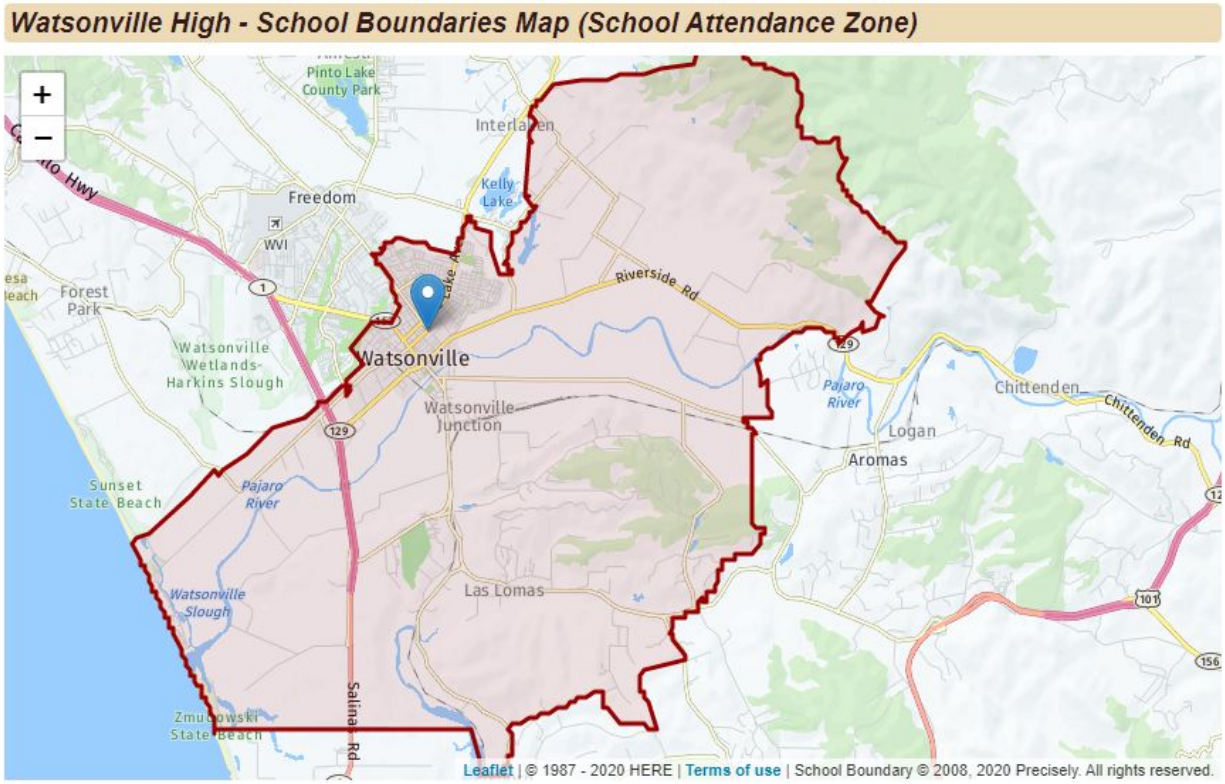
Figure 5 - Broadband Service Level and % of Population in Poverty at Census Tract Level. *Inset focuses on Watsonville Area.*



Case Study: Watsonville High School

Watsonville High School and most of its enrollment boundary is in the northern portion of District 30, although its attendance zones extend somewhat outside of the assembly district. As such, it falls within the "well-served" and "served" areas. Despite this, as students' interviews with peers, relatives, and acquaintances demonstrate, this infrastructure was often insufficient to meet the increased demands required for accessing schooling remotely. Importantly, interviews were conducted after the Pajaro Valley Unified School District had already undertaken efforts to address the digital divide through the distribution of Chromebooks, Internet hot-spots, and both remote and in-person tech support largely through philanthropic aid to address racialized digital divide inequities. As described in greater detail below, disparities in access and opportunity to learn in remote settings ran along lines of race, geographic location, and socioeconomic status.

Figure 6 - Watsonville High School Enrollment Boundaries



Findings from Student Interviews: Challenges Due to Internet Connectivity

While some respondents mentioned no new challenges related to Internet connectivity, the vast majority of interviewees identified broadband access as a significant barrier and source of frustration that inhibited their ability to access remote learning opportunities. Similar concerns were echoed by college students that were part of the interview pool. In addition, the family members, workers, and peers interviewed expressed challenges to working remotely, accessing online healthcare, and other concerns due to inconsistent, slow, and/or disrupted broadband access.

Findings: Challenges with Learning Remotely in Watsonville, CA

Students described a broad range of issues at the intersection of remote learning and internet connectivity that included: Limited ability to access (and stay connected) to synchronous learning opportunities, challenges with completing and uploading assignments, increased anxiety and stress about school, grades, and keeping up with classes due to slow/disrupted internet connections, and struggling to get the support needed from teachers due to issues associated with their own and their teachers internet challenges. Some students expressed awareness of and frustration about disparities in quality of internet connectivity across the state. One student expressed her experience of struggling with internet connectivity while living so close to Silicon Valley, succinctly capturing complex intersections of race, place, and socioeconomic status at the center of the issue:

> *I think it's kind of ironic because we're in a place that's supposed to be the highest of technology and yet to lower income families and to people that don't live near the city they don't have access to it. I've been seeing how there's more gentrification that's coming into where we live so it kind of makes me mad because the wealthy that are moving here have the chance to actually get good internet while us who have lived here since we were babies don't.*

1. Difficulty Accessing Synchronous Remote Learning

Many students described experiencing internet connectivity issues prior to COVID-related school closures while others expressed no major issues. However, since the start of remote learning in Spring 2020, the majority of students expressed significant issues related to broadband access and internet connectivity. The most common issues expressed were the insufficiency of broadband access to meet the increased high demands due to remote learning. For example, many students described living in multi-family households and/or having multiple siblings all trying to access online learning platforms (e.g., Google Meets, Zoom) at the same time and that internet access was unable to meet the demands. Students expressed that better connectivity would allow them to succeed in on-line learning contexts

and that better broadband meant better access to school. As stated by one student: "The students in our community could thrive and reach their best potential as long as they have the tools they need to succeed." Specific issues are outlined through quotes from interviewees below.

A. ***Internet issues/unreliable connections impacting schooling as a general phenomenon***:
    a. "Faster internet access for my neighborhood would be an improvement because I won't be in and out of zoom classes because it kicks me out or it's loading the screen for about 10 minutes due to poor internet connection."
    b. "Specific challenges are getting kicked out of class for low connection, assignments not loading because of low connection, not being able to connect to class at all. This affects my grade. I miss information that I didn't know."
    c. "I get kicked out of Google Meets and miss what the teacher is saying. Sometimes I get marked absent because I can't log in, or the audio cuts off when I speak.
    d. "The Internet is slow and things load slowly when the teacher asks us to open them."
    e. "The wifi doesn't reach everywhere in the house, so I have to be in specific rooms."

B. ***Multiple household users accessing internet for schooling at the same time***:
    a. "Since there are now three other people in my household doing online school work, the connection has been a lot slower and sometimes I will get kicked out of meetings and miss part of the lecture."
    b. "[The connection] it's always low or it's not working due to the fact that there's a lot of people on the internet and people can't get on."

2. Difficulty Completing Assignments

Students described issues with completing homework assignments because both downloading and uploading documents was time consuming (or not possible) due to slow connectivity.

a. "Jamboard doesn't load, Google Classroom takes a long time to load and I can't complete assignments on time."
b. "I'm not learning much, just trying to finish work because of how the internet is. I constantly have to fix the router and it makes it hard to concentrate. I get assignments that are due by the end of the day and it can be a hustle."

3. Difficulty Seeking Support or Clarification from Teachers

While teachers are working tirelessly to be responsive, adaptive, and creative, virtual contexts coupled with broadband issues make it difficult to offer the same level of support as during in person

instruction. Students expressed challenges associated with virtual instruction because they did not have access to the same resources and support they did when they attended school in person. In addition, there was no time to connect with teachers or ask them questions (e.g., about content, clarification of assignments). Students stated that some teachers also experienced internet issues, thus, creating a lag in response time out of their control.

a. "I'm trying so hard to keep up, struggling to teach myself work that I didn't know existed or when I can't communicate with teachers."
b. "Online learning has been difficult to manage because I have to teach myself. Now I can only communicate with teachers through Google Meets or email."

4. Stress, Anxiety and Mental Health Challenges Associated with Remote Learning

Many students described experiencing higher levels of stress over school due to uncertainty about internet connectivity and whether they would be able to successfully log into classes and/or complete and upload assignments. In addition, students expressed commitment to school but described frustration over not being able to connect to classes. Connectivity issues generated feelings of falling behind or being lost, and some students expressed wanting to give up.

a. "It would mainly be getting kicked out of class, slow internet to load pages, and not being able to turn in assignments. I believe that these challenges mainly impact my mental health, the stress that comes with late assignments."
b. "Honestly I want to drop out of school, I get too distracted and having slow wifi to none on some days discourages me from showing to class and completing homework."

5. Other Broadband Issues Related to Remote Learning

A. ***Cost:*** Students expressed varied extra costs associated with gaining better internet access for schooling purposes (e.g., "Since the pandemic we had to upgrade our router because the whole family stayed indoors. My parents had to spend a lot of money on better wifi").

B. ***Family Members Supporting Children in Online School****:* Some family members experienced challenges supporting their children in accessing remote school due to limited technological resources, experience, and connectivity issues. For example, a mother of four expressed that she was not particularly tech savvy and she struggled to help her young children (e.g., first graders) connect and reconnect to the necessary online learning platforms when connections were slow or cut out.

Findings: Other Challenges Associated with Unreliable and Limited Broadband Access

The family members, workers, and peers interviewed expressed challenges to working remotely, accessing online healthcare, and other concerns due to inconsistent and/or disrupted broadband access.

1. Interference with Work and Economic Risk in Community

*F*amily and community members that transitioned to remote work scenarios due to COVID-related shifts described issues with trying to work from home with limited and/or poor internet access.

a. "I struggle to work online from home. I'm a biller for a medical office so work is time sensitive. The biggest challenge is that the connection isn't great. I have to drive elsewhere and park to get work done...Instead of spending time with family I have to drive around and look for connection."

2. Access to TeleHealth and Healthcare Providers

Some community members described a particular struggle with connectivity issues because their doctor appointments and healthcare services had moved to telehealth and other remote formats. People described missing appointments and struggling to connect with healthcare providers in meaningful ways due to disrupted or limited internet access.

a. "With online telehealth it's difficult for us to fully express our feelings and pain."

3. Other

a. Connecting with community on a human level: "These challenges affect me because it's made it more difficult to understand each other as humans, we have created virtual barriers making it harder to understand what we want to say, show, or express."
b. Connecting with family in Mexico: "Ahora uso internet mas seguido para ver familia, que estén bien. Ahora es más difícil porque el internet es más despacio. Me siento frustrada, tengo muchos días sin saber de mi familia." (translation: " Now I am using the internet to see family more often, that they are well. Now it is more complicated because the internet is slower. I am frustrated, it has been many days without knowing about my family.")

Conclusion

Disparities in broadband access along racial, socioeconomic, and geographic lines across California's 30th Assembly District are widespread. In addition, the challenges experienced by students, families,

workers, and other community members in District 30 through a focus on Watsonville, CA, highlights how disrupted, inconsistent, and poor quality of internet connectivity negatively impacts learning opportunities, ability to work remotely, and take care of life needs virtually. Students described a broad range of issues at the intersection of remote learning and internet connectivity that included limited ability to access (and stay connected) to synchronous learning opportunities, challenges with completing and uploading assignments, increased anxiety and mental health challenges associated with trying to keep up with school and grades, and struggling to get the support needed from teachers due to issues associated with their own and their teachers' internet challenges. The most common issues expressed were all related to the insufficiency of broadband access to meet the increased demands due to remote learning. For example, many students described living in multi-family households and/or having multiple siblings all trying to access online learning platforms (e.g., Google Meets, Zoom) at the same time and that internet access was unable to meet the demands. Many students described experiencing higher levels of stress over school due to uncertainty about internet connectivity and whether they would be able to successfully log into classes and/or complete and upload assignments. The students, teachers, and community members of Watsonville demonstrated great perseverance and innovation to overcome the limitations of low quality broadband access. However, the resounding sentiment was that life in general and online school in particular would be a much easier, less anxiety producing, and a more successful experience if better internet connectivity was available in their community.

Appendix A
Student Interview Protocol (WHS ECHO Student Assignment)

Explanation and Context: You will be researchers for SJSU gathering data on how education is being impacted by lack of access to WiFi during distance learning due to COVID. You will be conducting research by interviewing peers, your family members, and other community members. Your interviews will help aid Assembly Rivas by providing valuable information about our community that will be used to push for better wifi in areas such as Watsonville. Ultimately, your interviews will be compiled into a report that will be shown to policymakers to enact real change!

Assignment Goals:

- To learn and practice professional interviewing skills
- To interview at least 5 people (more *quality* interviews can be provided for extra credit!) you know that have been impacted by distance learning
- To learn more about how different people in our community are being impacted by distance learning
- To provide research data to SJSU to be presented to Assembly Rivas

Assignment Checklist:

- ❏ 5 interviews of community members using audio format
- ❏ Audio (preferred) or video recording of your interview
    - ❏ If you do not have access to recording, you may provide a typed transcript of your interview
- ❏ Analysis of findings from interviews in project

Interview Etiquette:

- Introduce topic being interviewed on / why is this important to you and the person you interview
- Schedule a time that works for interviewee. Make sure its not the night before
- Dress appropriate. Whether you are in person or video chat interview
- Follow Social Distancing guidelines
- Create a conversation around the questions. Don't allow yes or no. Ask follow up.
- At the end of the interview, make sure to thank the interviewee.

In general, it helps to structure interview questions in an open-ended exploratory way so the interviewer is listening, learning, and understanding as the interviewee is describing their experiences. These interviews are semi-structured - meaning the interviewer has a protocol with guiding questions but they may ask follow up questions based on what they hear and are learning from the interviewee. This way there is a systematicity to the interviews yet they are conversational and adaptable.

Interviewers are encouraged to ask probing and follow up questions. Often saying simple things like - "tell me more about that..." can create space for the interviewee to elaborate and for the interviewer to gain rich insight.

Open-ended structure:

- Describe your typical internet use - what do you use the internet for?
- Describe your experiences with broadband access prior to the pandemic...
- Tell me about a time that you were impacted by internet accessibility in the last few months...
- **Follow ups**: Tell me more about that....; When you said X, what did you mean....; Say more...

Opening the Interview

Interviewer should introduce themselves to the interviewee, stating their name, affiliation, and purpose of the interview. Always ask the interviewee for their permission to be interviewed and to record the conversation and/or take notes. Remind the interviewee that they are not obligated to answer all or any of the questions and may stop the interview without penalty at their discretion.

Also be sure to ask the interviewee for a cross street or landmark near their place of residence. This will assist in mapping people's experiences against known broadband access.

Interview Questions:

Can you tell me about how you used the internet before the COVID-19 pandemic? What were some of the activities you did online, and how often were you online before?

Were internet connectivity issues a problem even before COVID? [if yes] Can you describe some of these challenges you had before?

How has the COVID-19 pandemic changed your need for internet connectivity? [Follow up if first response is vague, or "no"] - Are there new activities you do online, or new ways that you do previous activities?

Can you describe your experiences with (online learning/online work/telehealth/accessing support/etc)? [ask about all that are relevant, interviewer can probe for detail or specificity: "can you tell me more about that? What are some specific examples?" if interviewee gives vague or brief response like "it's been really hard"]

What are some of the specific challenges you deal with related to internet access?

How do these challenges impact your life? [can ask with specifics: ...impact your education?...your work?...your access to healthcare? ....your access to banking? ...your access to government services?]

How do you think things would be different if your community had better internet access (more reliable, faster connections)? [interviewer can probe for detail or specificity: "can you tell me more about that? What are some specific examples?"]