Increasing Street-Level Accessibility in Cuenca, Ecuador

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Abstract

Infrastructure in the city of Cuenca, Ecuador currently does not accommodate residents who suffer from mobility impairments. Inadequate ramps, unmaintained sidewalks, and scarce support from the government diminish the lives of individuals with physical disabilities. This project promoted change by gathering accessibility data throughout the city using a digital application called Project Sidewalk. While in Cuenca, the team observed the sidewalks in six neighborhoods, interviewed infrastructure experts and community members, and engaged the community with the software. The team's sponsor, EMOV EP, will use the data from Project Sidewalk to encourage the government of Cuenca to act on inaccessibility, making Cuenca's streets more inclusive for those with mobility impairments.

Acknowledgements

We would like to thank our sponsor, Guilherme Chalhoub Dorado, for working so tirelessly to ensure we have a successful project. We would also like to thank our advisors, Professor Robert Kinicki and Professor Gary Pollice, for giving us excellent feedback on all iterations of our work. We also thank Professor Kurlanska, who helped us create our proposal. We owe thanks to Professor Carla Hermida and Professor María Carrasco for helping organize mapping events at the University of Azuay. Lastly, we need to thank the creators of Project Sidewalk, Jon Froehlich and Mikey Saugstad, for bringing our vision to fruition by starting up a Project Sidewalk server here in Cuenca.

Executive Summary

Street-level accessibility ensures that anyone, regardless of their mobility level, can travel through a city without worrying about impassable obstacles. Sidewalk obstacles, such as a lack of curb ramps or uneven surfaces, can hinder a pedestrian's ability to travel safely to their destination. Addressing inaccessible infrastructure in a city promotes an inclusive environment for all its inhabitants. EMOV EP, Cuenca's Public Corporation of Mobility, Traffic, and Transportation, strives to make the city of Cuenca, Ecuador safer and more sustainable (EMOV, n.d.). For this project, the team partnered with EMOV to determine low-cost methods to address Cuenca's street-level accessibility barriers.

Cuenca is Ecuador's third largest city, with a population of 650,000 people (United Nations, 2014). Beginning in the 1960's, Cuenca saw considerable population growth and fast urbanization, leading to overcrowded streets that are not ideal for pedestrians (Centre, n.d.). Cuenca's historic center is a UNESCO world heritage site, and many sidewalks and other public infrastructure are outdated and inaccessible for individuals with mobility impairments (Centre, n.d.). For instance, curb ramps that are not level with the street make it impossible for wheelchair users to get onto the sidewalk. Additionally, bumpy, uneven sidewalk surfaces, and obstacles in the middle of the sidewalks, are safety hazards for many people with physical disabilities. The prevalence of narrow sidewalks prevents individuals in wheelchairs from traversing many streets. Overall, inaccessible sidewalk characteristics are apparent in Cuenca (see Figures E.1-E.3).

Figure E.1

Narrow Sidewalk

Figure E.2

Stairs in Sidewalk

Figure E.3

Obstacle in Sidewalk

Changing Cuenca's infrastructure is not a straightforward process. There are many stakeholders involved in putting a plan into action. For instance, the Mobility Department (DMT), the Urban Planning Department (SEGEPLAN), and EMOV, among other actors, must all work together to improve Cuenca's sidewalks. Thus, for this project, EMOV encouraged the team to determine a time-efficient, low-cost, and easy-to-implement solution to address street-level accessibility.

After conducting literature research, the team discovered Project Sidewalk, "a new web-based tool that enables online crowd workers to remotely label pedestrian related accessibility problems by virtually walking through city streets in Google Street View" (Saha et al., 2019, page 1). Users can "drag and drop" one of seven accessibility-related labels onto a digitalized map of the city's streets. The labels are curb ramps, missing curb ramps, obstacles in the sidewalk, sidewalk surface problems, no sidewalks, crosswalks, pedestrian signals, and other. The goal of this open-source application is to virtually audit as many streets in a city as possible. These maps provide data that can help people with mobility impairments determine accessible paths through their cities and give local governments insight about the areas in their cities that need the most improvement.

Upon arriving in Cuenca, the team's goal was to assist EMOV EP in their efforts to address street-level accessibility in Cuenca by implementing Project Sidewalk and determining methods to engage the community with this application. To complete the project's goal, the team used three methods. The first method was to conduct a modified pilot of Project Sidewalk. The second was to interview experts in infrastructure and members of the community. These two methods led to the completion of a third and final method: organizing and hosting a test "mapathon". The results of these three methods ultimately led the team to formulate recommendations for our sponsor about improving street-level accessibility in Cuenca.

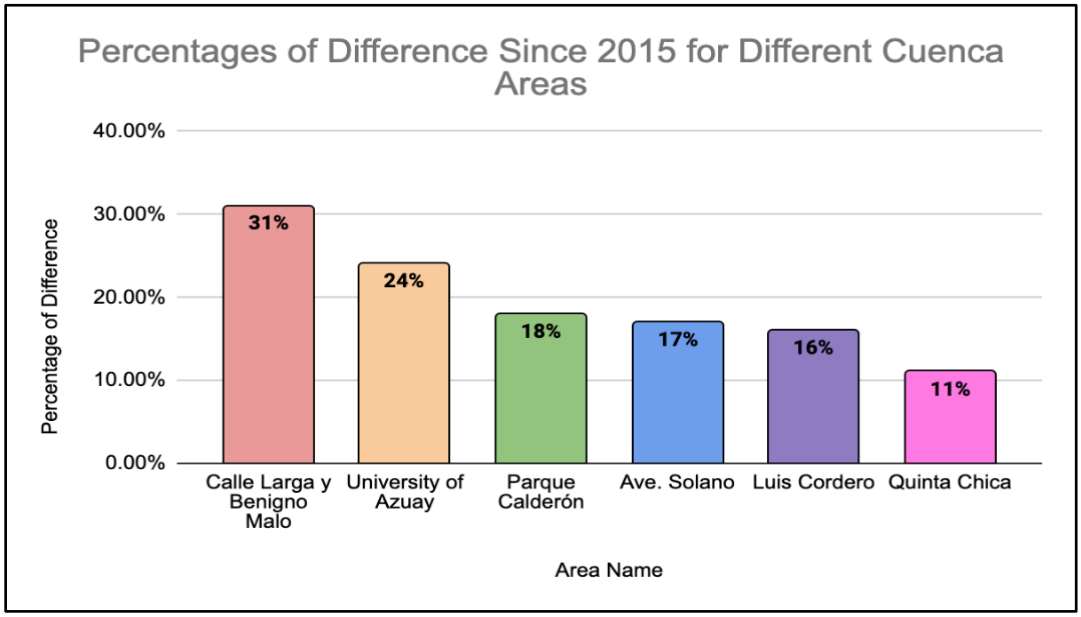
The first method, conducting a modified pilot of Project Sidewalk, helped the team understand Cuenca's current accessibility challenges and determine the relevance of Project Sidewalk for the city. To conduct the modified pilot test, the team observed six neighborhoods in-person. This included the area surrounding the University of Azuay, Quinta Chica, Avenida Solano, Parque Caldron, Calle Larga y Benigno Malo, and Luis Cordero. In five of the neighborhoods, the team observed five streets, and the sixth neighborhood, Luis Cordero, consisted of one 850-meter street. In total, the team's observations covered 26 Cuenca streets and approximately 7.3 kilometers.

To simulate Project Sidewalk during in-person observations, the team utilized the same labels on Project Sidewalk's interface. While walking through each neighborhood, team members counted every time one of the labels appeared. After these observations, the team conducted virtual observations of the same streets using Google Street View (GSV). Since Google last updated GSV for Cuenca in 2015, the team compared their in-person and virtual observations to look for any discrepancies. After analyzing the observations, the team found that most of the differences were

minimal. To calculate the percentage of difference between in-person and GSV for any given street or neighborhood, the team used the following calculation: **number of differences in GSV / number of in-person labels**. As seen in Figure E.4, the largest difference was in the Calle Larga y Benigno Malo neighborhood. Most of these differences stem from recent updates to Plaza San Francisco in a small area of this neighborhood.

Figure E.4

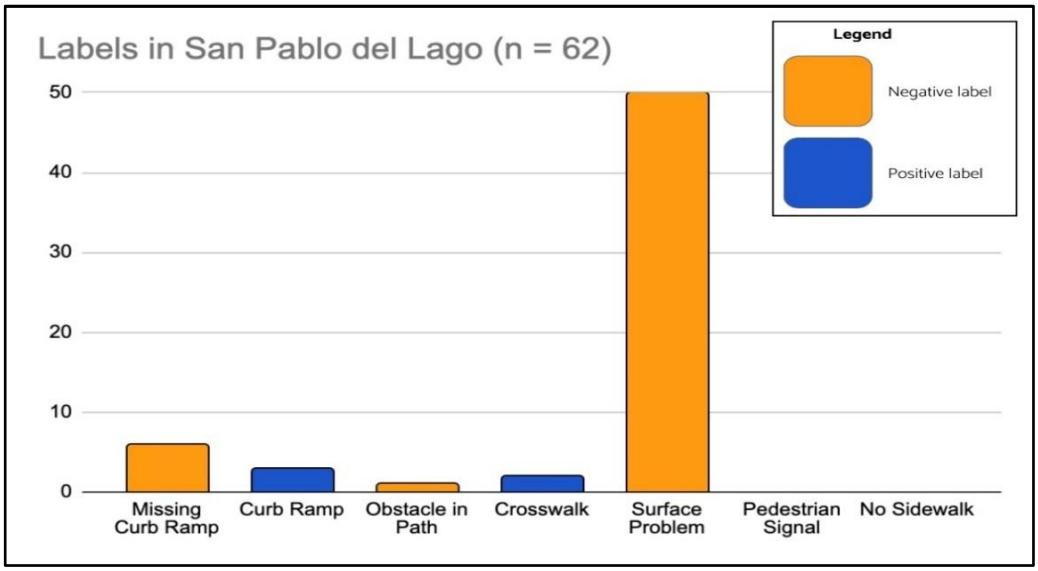
Percentages of Difference from GSV by Neighborhood



The team also calculated the frequency of positive and negative labels on each street observed. Positive labels are essentially improvements including items such as curb ramps, crosswalks, and pedestrian signals, while negative labels are missing curb ramps, obstacles, surface problems, and no sidewalks. These observations led the team to draw conclusions about which streets and neighborhoods need the most urgent attention from EMOV and other local government actors. Figure E.5 provides one example, the street San Pablo del Lago (in the Quinta Chica neighborhood), which is especially inaccessible. Most of the labels observed are negative, and team members encountered 50 surface problems on the 550-meter street.

Figure E.5

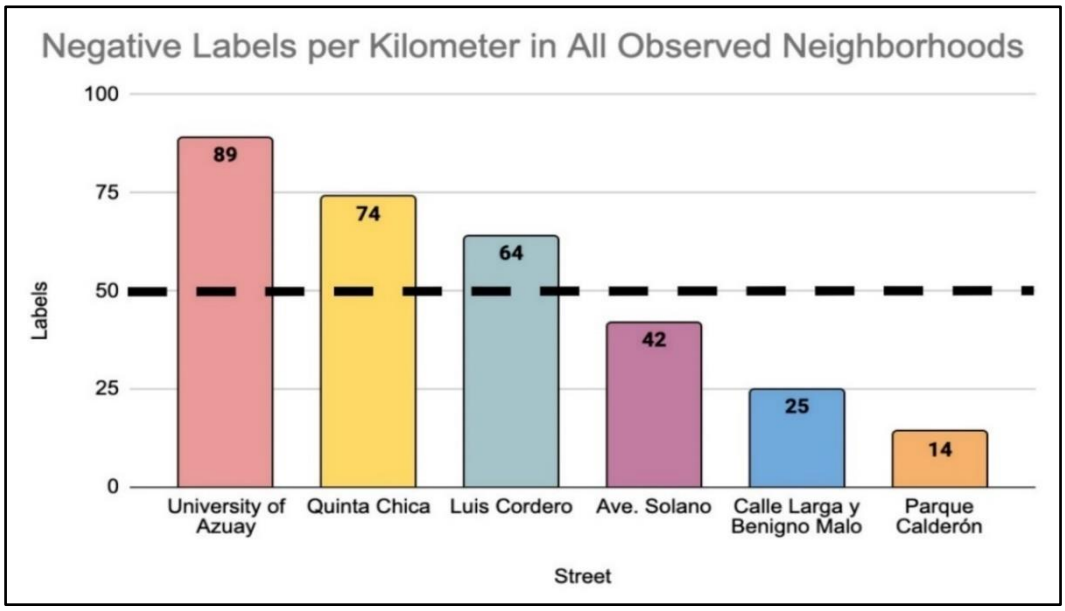
Frequency of Positive and Negative Labels in San Pablo del Lago



Lastly, the team calculated the number of negative labels per kilometer in each street and each neighborhood observed and determined an “inaccessibility threshold” of 50 negative labels per kilometer. Figure E.6 demonstrates that three of the six neighborhoods observed were inaccessible according to this metric. These three neighborhoods are on the outskirts of the city, showing how Cuenca neglects areas of lower income where there are fewer tourist opportunities.

Figure E.6

Negative Labels per km in All Observed Neighborhoods



The team utilized its second method, conducting interviews with experts and community members, to better understand Cuenca's accessibility issues, determine the relevance of using Project Sidewalk in Cuenca, and explore methods to engage the community with Project Sidewalk. The eight experts consisted of individuals with expertise in infrastructure, policymaking, and community engagement. The three community members consisted of individuals with mobility impairments and university students. The team coded these interview transcripts and identified frequently mentioned themes. When the team asked interviewees about Cuenca's worst street-level accessibility issue, the most common response was inadequate ramps. This includes curb ramps that are not level with the street, too steep, or not wide enough for wheelchair users. The team also asked interviewees about how to get the community to use Project Sidewalk. The two major responses were (1) implementing the software into a school curriculum (e.g., at the local universities) and (2) having the application be a means for individuals to gain community service hours. This helped team members narrow-down the best methods for community engagement, leading them to hold a test "mapathon" with urban studies students at a local university.

The test mapathon occurred in a class at the University of Azuay, and 18 students utilized Project Sidewalk on their laptops. They audited a total of 14 kilometers of Cuenca, placing 1,700 labels and validating 1,280 labels. Team-members consolidated all their knowledge from the test mapathon into one deliverable: a YouTube video with a step-by-step guide on how to accurately audit streets using Project Sidewalk. This video will play at a larger mapathon with 75 University of Azuay students on May 5th (once the team leaves Cuenca). Going forward, urban studies professors at the University of Azuay will assign Project Sidewalk auditing to their students (up to four hours per semester).

After completing their methods and analyzing their data, team members formulated several recommendations, which they presented to EMOV. First, the team recommended that EMOV and its governmental partners prioritize sidewalk improvements in the University of Azuay and Quinta Chica neighborhoods. These areas contained many accessibility issues, such as surface problems and missing sidewalks. Additionally, in their efforts to address street-level accessibility, EMOV and other agencies should focus on updating un-passable curb ramps. This was a common issue identified by both infrastructure experts and community members with disabilities. Finally, the team recommends that EMOV continually promote Project Sidewalk and use it to collect additional data. This will allow them to identify more inaccessible areas throughout the city for future improvement efforts. A continued relationship with professors at the University of Azuay is also important to gain further community participation. With the implementation of the recommendations in this report, EMOV can begin to improve Cuenca's street-level accessibility challenges, making the city more inclusive of those with physical disabilities.

Executive Summary References

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1.0 Introduction

According to the World Health Organization (2022), approximately 1.3 billion individuals across the globe “experience significant disability”. People with disabilities encounter various challenges in their everyday lives, such as restricted mobility, which includes difficulty with walking and/or other movements (World Health Organization, 2022). Individuals with mobility impairments may utilize canes or wheelchairs to help them get around; however, many environments remain inaccessible, meaning they do not accommodate those with physical disabilities and their unique needs.

Accessibility issues that seem minor to most people often have broader implications, creating a cultural divide between individuals with disabilities and those without disabilities. This occurs in Zambia, a country where residents face ongoing accessibility challenges. A study from Banda-Chalwe et al. (2014) found that people with disabilities are more often unemployed than those without disabilities (54.5% vs. 42.0%, respectively). This disparity is the result of people with disabilities lacking proper resources in their cities. For example, public infrastructure in Zambia is inaccessible for those with mobility impairments (Banda-Chalwe et al., 2014). Unsafe sidewalks or an inability to safely use public transportation may discourage individuals with disabilities from commuting to work.

There are numerous factors that can impair one’s ability to navigate through a city safely. People without disabilities can also feel the first-hand effects of cities lacking accessible infrastructure. For example, a mother pushing a stroller cannot safely use stairs, and an elderly person may struggle to quickly cross the street. Street-level accessibility is a widespread issue, and cities need to prioritize developing solutions.

One city that faces significant accessibility challenges is Cuenca, Ecuador. As of 2023, Cuenca is Ecuador’s third largest city, with a population of over 650,000 people (United Nations, 2014). The city quickly transitioned from a secluded community to a densely populated urban area beginning in the 1960’s. Cuenca’s fast urbanization combined with its traditional architecture produced various accessibility challenges, including aging streets and sidewalks, a high concentration of motorized vehicles, and cramped sidewalk space due to street vendors and construction (Centre, n.d.). Many elderly individuals from other parts of the world retire in Cuenca due to the low cost of living and scenic environment (Prescher, 2021). Although accessibility barriers can affect anyone, older individuals feel these effects more strongly, as do Cuenca citizens with varying disabilities (Prescher, 2021). The current inaccessible infrastructure in Cuenca’s streets makes life more difficult for these demographics.

In 2006, 82 countries, including Ecuador, signed the United Nations Convention on the Rights of Persons with Disabilities (CRPD), promising to provide accommodations for citizens with disabilities (United Nations, 2006). However, major cities in Ecuador are not updating their infrastructure to reflect the accessibility standards outlined in the CRPD (United Nations, 2015). Thus, local municipalities, like the government of Cuenca, are trying to take action to increase accessibility in their city's streets for those with disabilities and impaired mobility.

The purpose of this project was to work with a local government agency, Empresa Pública de Movilidad, Tránsito y Transporte de Cuenca (EMOV EP), to address street-level accessibility in Cuenca. With fewer than 250 employees, EMOV gives out license and vehicle registrations and covers debt consultations. More importantly, EMOV pushes for mobility reforms to make the city more inclusive of all its citizens (EMOV, 2023). Therefore, the project's goal closely aligns with EMOVs mission, which is "to promote a culture of integral mobility, through the link with society and with a quality service and constant innovation" (EMOV, 2023). To complete this project, the team researched the importance of accessible cities and challenges Cuenca currently faces. Upon arriving in Cuenca, the team partnered with Project Sidewalk, an organization that works to improve accessibility in cities across the globe. Project Sidewalk launched a webpage for the city of Cuenca, allowing users to identify inaccessible areas in the city. The team conducted observations and interviews to determine the effectiveness of this software and feasible ways to engage the community. Project Sidewalk requires digital auditing of large amounts of city area, which is most successful when a community collaborates on this process.

The team identified neighborhoods in Cuenca that struggle to accommodate people with disabilities. Ultimately, the team presented these findings to EMOV EP so they can continue to promote the use of Project Sidewalk in Cuenca and begin to address the most inaccessible areas of the city.

2.0 Background

Before developing a plan to address street-level accessibility in Cuenca, the team investigated the broader concepts of accessibility and inclusivity. The United Nations (UN), an international human rights organization, defines accessibility as “the provision of flexibility to accommodate each user’s needs and preferences” (United Nations, 2015, page 3). While this definition is broad, it applies to various aspects of life. In the context of urban development, accessibility refers to designing and implementing infrastructure that all people can easily use (United Nations, 2006). This chapter discusses the importance of accessible cities, aspects that make a city inaccessible, Project Sidewalk as a strategy to address street-level accessibility, and specific accessibility challenges in Cuenca.

2.1. Why Do We Need Accessible Cities?

Accessible cities embrace individuals of varying abilities, providing necessary accommodations for those in need. All people, regardless of their disability status, have the right to participate in their communities. The UN published its Convention on the Rights of Persons with Disabilities (CRPD), and Article 9 contains specific accessibility guidelines. With regards to accessible infrastructure, the article states, “the identification and elimination of obstacles and barriers to accessibility, shall apply to buildings, roads, transportation and other indoor and outdoor facilities” (United Nations, 2006, paragraph 1). Accessible infrastructure may include ramps for individuals in wheelchairs or widened sidewalks (Elaine, 2019). The CRPD also noted that braille signage and sign-language interpreters are necessary to create communities that are inclusive of blind and deaf individuals– in addition to those with mobility-related impairments (United Nations, 2006). The UN developed its CRPD guidelines because it is important for people with disabilities to have equal access to everything their communities have to offer.

The UN’s CRPD guidelines challenge countries to actively protect the rights of their disabled citizens. Many nations, such as the United States, have passed specific accessibility laws. According to Malloy et al. (2017), the American with Disabilities Act (ADA) protects individuals with disabilities and includes regulations for public infrastructure. Governments should ensure roads and sidewalks are accessible, as mobility impairments are common in many communities. For instance, “approximately 18–20 percent of American families have a family member with mobility impairment” (Malloy et al., 2017, page 404). The ADA established regulations for properly maintaining sidewalks, including snow-removal and pothole prevention

(Malloy et al., 2017). Such measures are critical for achieving accessible and inclusive cities, and communities across the globe should apply these frameworks.

Similar to the ADA, Mexico implemented its General Law for the Inclusion of People with Disabilities; Article 17 specifically discusses accessible infrastructure (Estados, 2011). The law requires the use of inclusive pedestrian signage, a braille information system, and accommodations for those with service animals (Estados, 2011). These policies further promote accessibility in cities across the nation.

2.2. Factors that Contribute to Inaccessible Urban Areas

Although there has been progress made towards accessibility in different areas around the globe, there are still obstacles present in major cities. An inaccessible city is one that does not accommodate individuals who have a disability, are pushing a stroller, are elderly, or experience some other atypical mobility challenge. Physical barriers in both sidewalks and public transportation can contribute to a city's inaccessibility. One common problem regarding urban accessibility is a lack of ramps in areas where stairs are present or in an area of boarding for public transportation. A study in Swansea City, Wales, found that 90% of individuals using wheelchairs found public transportation to be "very difficult" to use as a direct result of no ramp being present when boarding a method of transportation (Bromley et al., 2007). The absence of a safe option for wheelchair users to access public transportation discourages them from using such transportation methods. Places that have adequate ramps can still yield their own set of challenges. For example, ramps that do not have rails function poorly compared to those with rails (Banda-Chalwe et al., 2014). This lack of rails encourages a fear of falling and, as a result, individuals will choose not to use the ramps even though they are available.

Sidewalk design is another critical part of making cities safe for pedestrians. Sidewalks should be wide enough to accommodate multiple people walking at once, and they should permit individuals in wheelchairs to safely get around, especially when other pedestrians are present. Poor sidewalk maintenance leads to an increase in vehicles hitting pedestrians, specifically when pedestrians are walking in the street to avoid the sidewalk. Pontiac, Michigan suffers from poor sidewalk treatment. A Pontiac study saw that 45.8% of its fatal car crashes involved pedestrians, which is substantially more than the state average of 16.5% (Rajaee et al., 2021). Observers found that this disparity is a result of pedestrians preferring to walk in the street, due to the city improperly maintaining sidewalks, or the sidewalks naturally being too narrow or completely missing. Sidewalks around the world do not comply with modern accessibility standards for many different reasons, thus making them unsafe (Rajaee et al.,

2021). In the United States, many of the sidewalks do not follow the Americans with Disabilities Act of 1990 (Rajaee et al., 2021), because most cities constructed their sidewalks prior to 1990.

Visually impaired individuals can also experience a lack of safety considerations. For example, a vision-impaired individual using a new curb ramp cannot identify where the sidewalk ends and the street begins (Lee, 2011). The problem here is that there is no indicator, auditory or tactile, that a person with vision-impairments can rely on to safely traverse between the street and the sidewalk. Figure 2.1 shows an example of a tactile surface indicator called a truncated dome. A truncated dome is a rectangular surface with small, circular grooves on a ramp where the sidewalk meets the street. A vision-impaired individual can feel the grooves with their shoes or a walking cane and know they are about to approach the street (Demirkan, 2013). Truncated domes notify a vision-impaired individual that they are near an intersection and allow them to safely maneuver through traffic. Without them, these individuals have a much more difficult time traveling through a city (Demirkan, 2013).

Figure 2.1

Photograph of Truncated Dome

Auditory cues are as important as tactile indicators when considering a city's level of accessibility. A group of researchers from Japan asked vision-impaired individuals where they feel the most inconvenienced by a lack of auditory cues (Bilal Salih et al., 2022). One respondent expressed that it would be helpful for a sound cue near escalators, indicating which direction is going up and which is going down (Bilal Salih et al., 2022). Cities can apply this same ideology to smaller-scale locations. For example, an auditory cue at an intersection would allow individuals to know how much time they have to cross the street (Bilal Salih et al., 2022). Without a cue like this, people with vision impairments may have no idea if they are in the path of incoming traffic (Bilal Salih et al., 2022).

Cities trying to implement accessibility measures realize that it can be difficult to accommodate multiple types of disabilities at once, due to budget constraints and a lack of community education regarding the importance of sidewalk safety. Because accessibility encompasses inclusivity for everyone, many cities continue to face accessibility challenges due to hardships with balancing all the different accommodations that a diverse community requires.

2.3. Project Sidewalk

One solution that cities across the world are using to address street-level accessibility is Project Sidewalk. Project Sidewalk is “a new web-based tool that enables online crowdworkers to remotely label pedestrian related accessibility problems by virtually walking through city streets in Google Street View.” (Saha et al., 2019, page 1). Google Street View, or GSV, is an application that provides a 360-degree virtual representation of many areas around the world (Anguelov et al., 2010). Through Project Sidewalk, users anywhere in the world can label accessibility issues on city streets by virtually “walking” through GSV, as long as they have a web browser and an Internet connection.

Project Sidewalk uses seven primary categories (see Figure 2.2) to describe different parts of the sidewalk environment that impact mobility and accessibility: curb ramp, missing curb ramp, obstacle in path, surface problem, no sidewalk, crosswalk, and pedestrian signal. With each label, the user must enter the degree of severity on a scale from one to five, with one being passable and five being not passable. The user can add an optional comment, to indicate whether or not the problem is temporary, and/or add a tag that further describes the issue. Each label has a set of four to eight tags. For example, a user can tag a surface problem label as bumpy, uneven/slanted, height difference, or more.

Figure 2.2

Screenshot Showing the Project Sidewalk Interface

Note: Project Sidewalk produced this photo. From “Oradell Project Sidewalk”, 2022.

The success of Project Sidewalk relies on the accuracy of the input data. To handle this, Project Sidewalk divides their missions into two types to gather data: labeling and validating. When labeling, the user audits the streets by finding, labeling, and assessing sidewalks. When validating, the user corrects the labels already in place on the city’s server. Although launched in Washington D.C., Project Sidewalk is expanding into cities across the world such as Mexico City and Amsterdam because it is a low-cost and fast-to-implement solution to address street-level accessibility. With a complete map of all the accessible issues in a city, city planners can easily identify where to focus their efforts, and citizens with mobility impairments have a tool to know the areas of a city to avoid.

2.3.1. Case Study in Seattle

Seattle’s hilly terrain and lack of infrastructure can be a challenge for those with disabilities trying to navigate the city via sidewalks. The city dealt with accessibility issues for a

long time, but in recent years the city has taken an initiative to improve accessibility for pedestrians through funding from the federal government. As of 2017, city officials settled a lawsuit in the U.S. District Court with an agreement to fix or install 22,500 curb ramps by 2035. More recently, in 2022, Seattle received $25.6 million dollars as part of the $1.2 trillion bipartisan infrastructure law with plans to build 1.5 miles of safer sidewalks, 4 miles of protected bike lanes, speed bumps and road narrowing on 4.5 miles of roads, and 117 intersection updates (Clarridge, 2023). Overall, the city is on the right track to fix its accessibility issues, but the implementation of these solutions will take at least a decade to complete. This may not be a sufficient change for those that need to commute throughout the city during the timespan of these infrastructure changes. The implementation of Project Sidewalk in 2022 provided a short-term solution for those most affected by the inaccessible infrastructure. Since it is a virtual resource, users can plan their way around an urban area by identifying spots of inaccessibility before they leave their homes. They can avoid these areas and run into fewer issues altogether.

Beginning in 2019, the Project Sidewalk team interviewed people with mobility impairments to learn exactly how inaccessible infrastructure affects their lives. From there, the team began utilizing the crowd-sourcing method (i.e., having many public participants virtually audit the streets) to collect street-level data about the city's accessibility (McQuate, 2019). The pilot study examined the potential of using large-scale open crowd-sourced sidewalk data to study distribution and condition of sidewalks in Seattle (Li, Chu, et. al 2022).

In addition, the researchers investigated how sidewalk quality scores correlate to neighborhood sociodemographic characteristics. Between April 2019 and August 2022, the team remotely collected data in Seattle's neighborhoods to determine sidewalk equity. Equity in this context is the uniform spatial distribution (i.e., consistent size of sidewalks) in a geographical region. According to the US Census, each neighborhood is a "block" containing 600-3,000 residents. The American Community Survey (ACS) says block groups are the most accurate representation of urban neighborhoods' size, and they are approximated using socio-demographic data. Overall, Project Sidewalk relies on four primary datasets when assessing sidewalk equity: Project Sidewalk labels, sidewalk and building block group GIS from the City of Seattle, and the ACS 2019.

A key takeaway from this study was the success of Project Sidewalk's implementation. Exactly 7,179 users virtually audited the city, covering around 93.8% of all the streets in Seattle (Li, Chu, et al., 2022). Over the course of three years, 211,350 completed accessibility labels had an accuracy rate of about 85%. Project Sidewalk removed 53,791 (15.3% of the total amount) of those labels because an inference algorithm deemed them low-quality. This Artificial

Intelligence (AI) algorithm assesses the correctness of a user's labels to limit disparities in the entire data set. This was one of the first case studies to use an AI inference algorithm to validate labels. Project Sidewalk continued to use the same algorithm in later projects, such as the one in Mexico City, to help ensure consistency between labeling and the data from GSV.

2.3.2. Case Study in Mexico City

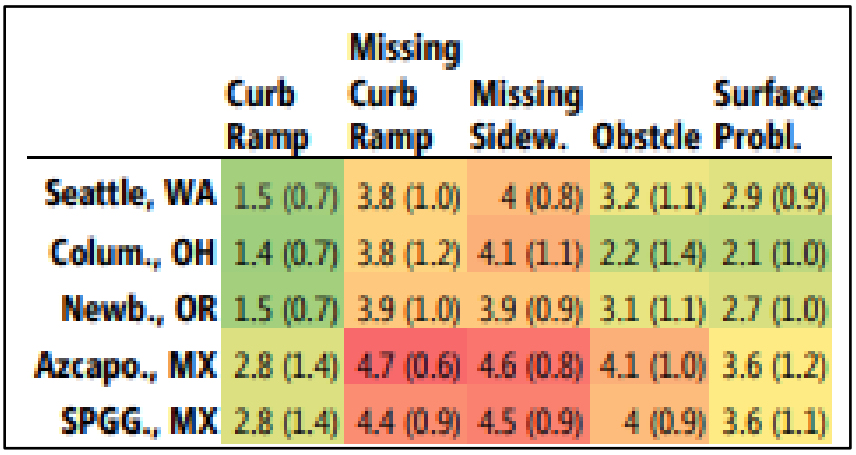
Project Sidewalk continues to expand into cities around the world, specifically in Mexico. They have expanded their efforts to cities in Mexico such as Mexico City (Azcapotzalco) and San Pedro Garza Garcia (SPGG). In 2005, Mexico passed a law to protect the rights of individuals with disabilities, called Ley General de las Personas con Discapacidad (Estados, 2011). This law mandated the creation of the Consejo Nacional para las Personas con Discapacidades (CONADIS), which is still prevalent in Latin American countries to this day including Ecuador. This law changed throughout the years to enable more comprehensive disability rights legislation which added to promoting, protecting, and ensuring the inclusion of all disabled citizens. While disability rights and accessible design requirements were a step forward for Mexico, the country still has trouble accessing data, tools, and other information to track the progress of their accessibility. It can become time-consuming and difficult to assess sidewalk development and ensure it is within standards set by legislation (Froehlich, 2020).

Project Sidewalk teamed up with Liga Peatonal, a non-government organization (NGO) focused on pedestrian improvement to increase the safety and accessibility of public spaces in Mexico. Liga Peatonal explored the feasibility of implementing Project Sidewalk into various areas around Mexico. Due to Project Sidewalk being new to Latin America, they had to work closely with the Liga staff to translate interfaces in the application, as well as adding locale-specific label tags. In many Latin American countries, it is common to encounter driveways that either cause surface problems or block the sidewalk entirely. As of 2023, Project Sidewalk has mapped out 354.2 miles and 108,535 labels in SPGG. In Azcapotzalco, they covered 266.3 miles and 57,120 labels (Froehlich, n.d.). Their preliminary research indicates that sidewalk obstructions are more common there than in the United States. Figure 2.3 demonstrates how the severity of labels were on average higher than the severity of labels in the U.S. (Froehlich, 2020). For example, most curb ramps in America have a severity of 1.5, which is passable. However, in Mexico, the average severity for curb ramps is 2.8 which is somewhat not passable. Furthermore, labels such as missing curb ramp, missing sidewalk, and obstacle tend

to stay between a severity of 3-4, but in Mexico these same label severities range from 4-4.7, which implies the sidewalk is completely impassable.

Figure 2.3

Average Severity of Sidewalk Issues in Five Cities



	Curb Ramp	Missing Curb Ramp	Missing Sidew.	Obstcle	Surface Probl.
Seattle, WA	1.5 (0.7)	3.8 (1.0)	4 (0.8)	3.2 (1.1)	2.9 (0.9)
Colum., OH	1.4 (0.7)	3.8 (1.2)	4.1 (1.1)	2.2 (1.4)	2.1 (1.0)
Newb., OR	1.5 (0.7)	3.9 (1.0)	3.9 (0.9)	3.1 (1.1)	2.7 (1.0)
Azcapo., MX	2.8 (1.4)	4.7 (0.6)	4.6 (0.8)	4.1 (1.0)	3.6 (1.2)
SPGG., MX	2.8 (1.4)	4.4 (0.9)	4.5 (0.9)	4 (0.9)	3.6 (1.1)

Note: Project Sidewalk produced this graph. From “Sidewalk Accessibility in the US and Mexico: Policies, Tools, and A Preliminary Case Study”, 2020.

SPGG and Azcapotzalco plan to use the Project Sidewalk data to inform public policy, assess and triage problems, and as an outreach tool for citizens. As of 2023, the San Pedro government uses the data to understand inaccessible infrastructure, examine correlations with pedestrian injuries and fatalities, and develop the municipality’s new urban master plan with a focus on improved accessibility (Froehlich, 2021). This new plan, called “The 2030 Municipal Urban Development Plan”, revolves around four main goals, the most important being to propose a new and sustainable vision for mobility in SPGG (ARISTA, 2023). With this case study proving to be successful in Mexico, the opportunity for Project Sidewalk to expand into other Latin American countries would be feasible and beneficial.

2.4. Community Engagement

The success of Project Sidewalk depends on community engagement. Community members must virtually audit their city’s streets, identifying areas that are inaccessible. If the community does not actively participate in the auditing process, Project Sidewalk will lack important data regarding the city’s overall accessibility. Understanding effective methods of community engagement is crucial to Project Sidewalk’s implementation.

Researchers have identified various types of community engagement and corresponding methods. According to Bowen et al. (2010), “Community engagement strategy is the pattern of activities implemented by firms to work collaboratively with and through groups of people to address issues affecting the social well-being of those people” (page 297). Businesses and nonprofit organizations need to use effective community engagement strategies to advance their social justice and community service projects (Bowen et al., 2010). One example of a “social good” project is the Friends in Health (or Amigos en Salud) initiative spearheaded by Pfizer, which encouraged collaboration between healthcare professionals and Latino community members experiencing diabetes. Other examples include Hook & Ladder, a large brewing company, which worked to support firefighters with their “A Penny for Every Pint” campaign, and Weyerhaeuser, a lumber company, which partnered with indigenous governments in Canada to support sustainable forestry (Bowen et al. 2010). These projects required extensive engagement from community members to attain success.

Bowen et al. (2010) suggested that community engagement methods fall on a continuum– from least to most effective. The continuum begins with transactional methods of engagement, where the organization provides information to community members through advertisements, infomercials, social media posts, or other methods of one-way communication (Bowen et al., 2010). The second phase on the continuum is transitional engagement, where community members begin to take an active role in the project, particularly through interviews and consultations that provide feedback to the organization (Bowen et al., 2010). Finally, the most effective methods of community engagement are transformational. With these methods, community leaders help implement the organization’s project and are actively involved in decision-making. Additionally, community members heavily participate in the initiative (i.e., they are on the “front-lines” of the project), which leads to positive change.

Other experts have highlighted various strategies to engage community members in large-scale projects. According to Wilson (2011), most people need incentives to participate in community service and social outreach initiatives. They are more likely to engage in work if they feel like they are personally benefiting from it (Wilson, 2011). In the United Kingdom (UK), roughly 30% of people account for 90% of the volunteer work done each year (Wilson, 2011). Experts suggest several strategies to increase the number of actively engaged citizens. For instance, Biggs (2023) recommends marketing events on social media and reaching out to local news sources to gain further publicity. Similarly, Wilson (2011) says that a mix of in-person meetings and online communication is beneficial to accommodate different people’s preferences.

Wilson (2011) highlights the importance of understanding your audience, and Biggs (2023) takes this a step further. He suggests using different “calls to action” depending on the group you are trying to target. The language you use to market an event/initiative should be relevant to the population of interest. Furthermore, it is important to make projects easy and fun for participants, which includes interactive games, competitions, and bringing people together to socialize (Wilson, 2011). Finally, Biggs (2023) suggests “leveraging existing community groups and organizations” to see if they can lead any tasks for you. Many organizations already have a network of highly committed volunteers. Ultimately, people want to be actively involved in the solution, so it is important to give them enjoyable opportunities to contribute (Biggs, 2023). Creating a sense of urgency around the issue at hand can also motivate people to participate in your initiative (Biggs, 2023). Making the community care about your project by articulating how their participation can alleviate a pressing problem is an integral part of community engagement strategy.

2.4.1. Project Sidewalk’s Community Engagement Strategies

Due to Project Sidewalk’s free and open-sourced nature, the success of the program depends heavily on community engagement. Project Sidewalk emphasizes the ease of access to sidewalks, utilizing advocates such as citizens, non-profit organizations, schools or government officials (Froehlich, 2022). Project Sidewalk has expanded to different areas across the globe, each of which used different methods of community engagement to drive the success of their program. In Oradell, New Jersey, the Bergen County Chapter of the National Multiple Sclerosis (MS) Society reached out to a girl scout troop asking for assistance mapping the sidewalks of Oradell. After the two organizations agreed to work together with Project Sidewalk, they held “mapathons,” which are events with the intention of bringing together a large abundance of volunteers to get together and audit the city streets using Google Street View. Project Sidewalk promoted these events on social media, and the girl scouts were able to inform their friends of the mapathons and bring together a larger audience. The girl scout troop and the MS society also partnered with Hackensack Meridian School of Medicine as well as the Makeability Lab from the University of Washington. Having four organizations working together brought in numerous volunteers which made the mapping process go much faster.

In Amsterdam, Project Sidewalk worked with an organization called World Enabled. They are a group that promotes the sustainability of inclusive and accessible futures for all people (World Enabled, 2021). In both Oregon and San Pedro, Mexico, Project Sidewalk

worked with the local governments of each area. Furthermore, Project Sidewalk has documentation on training sessions to ensure that their volunteers are correctly auditing the streets. These training sessions serve to excite the volunteers about the work that they are going to do and express how it will make a difference. Project Sidewalk also emphasizes the inclusivity of people with disabilities when creating their programs (Froehlich, 2022). They encourage organizations to invite people with disabilities to their mapathons, as those are the groups of people who have the most knowledge on how different street obstacles affect the people who use them.

2.5. Accessibility Challenges in Cuenca

In 2014, the United Nations (UN) issued a press release, describing the treatment of people with disabilities in Ecuador. The UN's Committee on the Rights of Persons with Disabilities evaluated Ecuador's laws and determined that the policies did not adequately protect people with disabilities, particularly when it came to accessibility. In 2008, with the adoption of a new constitution, Ecuador's government began to implement more inclusive laws, which led to an improved quality of life for many people with disabilities (United Nations, 2014). However, many of these progressive policies, while steps in the right direction, failed to meet the UN's accessibility standards (as outlined in its Convention on the Rights of Persons with Disabilities (CRPD)) (United Nations, 2014). In 2012, Ecuador passed its Organic Law on Disability along with other governmental initiatives; however, experts noted that those efforts fell short (United Nations, 2014). For instance, as stated in the UN's press release, the "Convention provisions were not fully transposed into Ecuador's legislation. Ecuador needed to apply the concept of reasonable accommodation, introduce appropriate anti-discrimination legislation, promote a positive image of persons with disabilities, [and] guarantee their access to justice," among other things (United Nations, 2014, paragraph 14). Therefore, despite efforts to increase protections for persons with disabilities in Ecuador, accessibility challenges remain evident throughout the nation. Many individuals with disabilities continue to experience obstacles in their daily lives–particularly while navigating city streets.

One of Ecuador's biggest cities is Cuenca, with a population of approximately 650,000 people–many of whom experience a disability (United Nations, 2014). As seen in Figure 2.4, adapted from Ministerio de Salud Público (2015) and Brinkhoff (2020), the Azuay province, which includes the city of Cuenca, has the highest per-capita percentage of residents with disabilities in the nation. Figure 2.5 shows there are five different categories of disabilities,

including physical, intellectual, auditive, visual, and psychological. The most prevalent type of disability in Cuenca is physical at 46.53 percent (CONADIS, 2022). The city's streets should be accessible and accommodate the unique needs of all inhabitants, particularly those with disabilities.

Figure 2.4

Ecuador Provinces and Residents with Disabilities

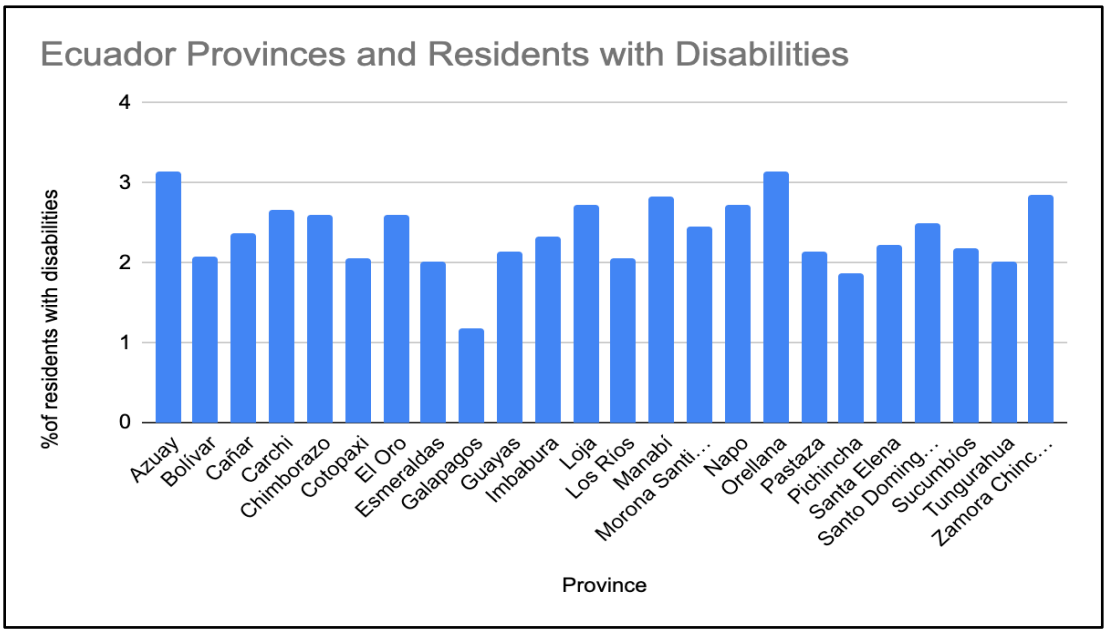
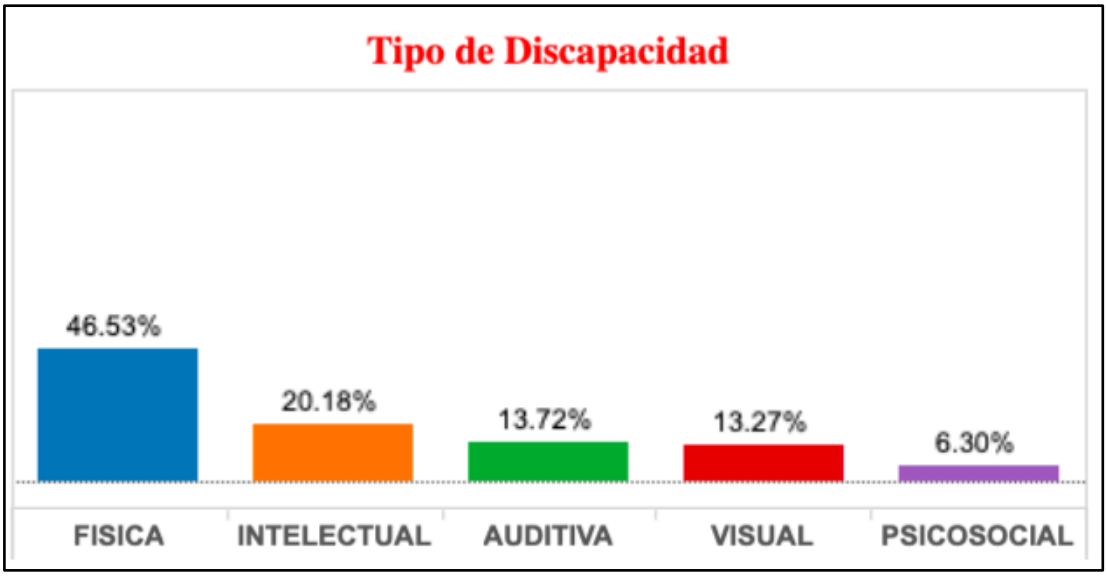


Figure 2.5

Cuenca's Distribution of Disabilities



Note. CONADIS produced this graph. From "Estadísticas de Discapacidad," 2022.

In 2020, faculty at the University of Cuenca conducted a study that analyzed street-level accessibility throughout the city. Researchers audited a total of 214 street segments, assessing levels of compliance with Ecuador's national standards of accessibility (Orellana et al., 2020). The researchers concluded that 0 of the 214 street segments fully complied with the standards (Orellana et al., 2020). Additionally, the research team enlisted participants from three different mobility categories to further audit the city's streets. Participants with (1) unrestricted mobility, (2) restricted mobility (pushing a stroller), and (3) impaired mobility (using a wheelchair) traveled throughout Cuenca and reported their abilities to overcome various obstacles (Orellana et al., 2020). They assigned scores to each obstacle ranging from 0 (impossible to overcome) to 1 (easy to overcome), with participants assigning scores of 0.1, 0.2, 0.3, etc. (Orellana et al., 2020). Participants from all groups experienced difficulties overcoming street-level obstacles, and those with impaired mobility suffered the most. Mean scores were 0.4 for the unrestricted group, 0.29 for the restricted group, and 0.12 for the impaired mobility group (Orellana et al., 2020). Since these average scores were close to 0 (which indicates the obstacle was impossible to overcome), the researchers concluded that the streets are extremely inaccessible. Wheelchair users rarely could overcome obstacles, as their mean score of 0.12 indicates. Some of the most disruptive obstacles were manhole covers, curb ramps, driveway ramps, inconsistent pavement, and poles on the sidewalk (Orellana et al., 2020). Other literature has reported additional walking hazards in Cuenca's streets. For instance, Elaine (2019) reported cases of pop-up stores (small stands set up by street-vendors) and construction scaffolding blocking the sidewalks. These obstacles, while hindrances to accessibility, may be signs of community improvement. Thus, one must be mindful of all implications when considering solutions.

2.6. Cuenca's Network of Actors

Addressing the accessibility challenges in Cuenca involves taking into account a variety of different stakeholders. These stakeholders are part of the network of actors in Cuenca who can implement changes to the city's infrastructure. Developing an actor-network theory is a method to map the constantly changing network of relationships within a system, noting issues between any actors (Cazorla, 2021). A network of actors can include those with administrative power, organizations that advocate for a change, or those who protest a change from happening. Specifically, when discussing the improvement of sidewalks, individuals who

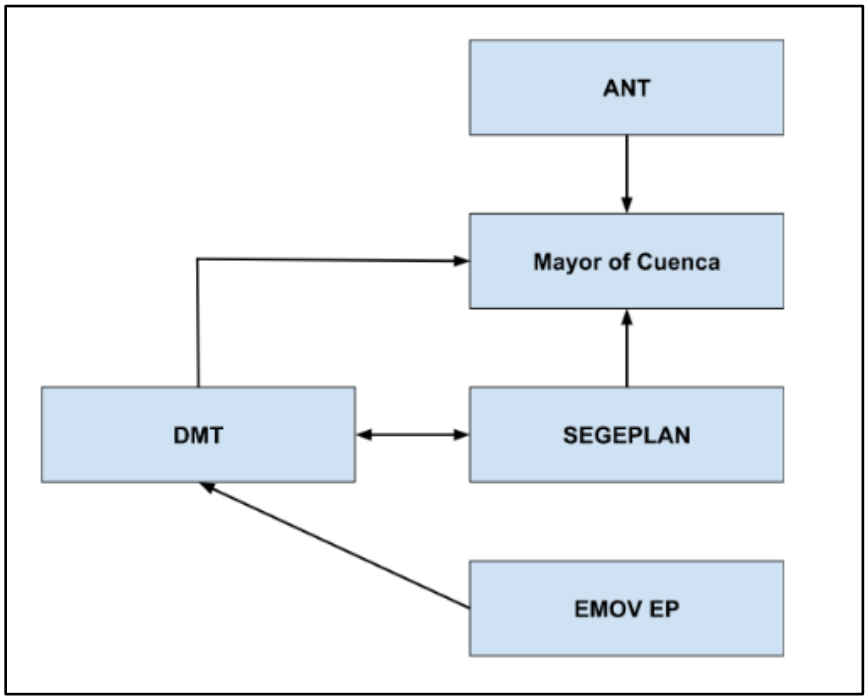
struggle first-hand with disabilities or other mobility impairments are some of the most visible and impactful advocates for such changes.

The decentralization movement in Ecuador began shifting power in the 1990's from a national level to a local level, giving municipal (canton-level) governments more authority (Keese, 2006). The Law of Social Participation and Decentralization of the State gives the authority of previously national responsibilities to the local governments (Keese, 2006). As of 2008, article 264 in the Ecuadorian Constitution outlines the exclusive jurisdictions that municipal governments have. Specifically, the article states that municipal governments have the ability, "To plan canton development and draw up the respective land use development and management plans in coordination with national, regional, provincial and parish planning, with the aim of regulating the urban and rural land use and occupation." (Asamblea Nacional de Ecuador, 2008). Municipalities have the right to implement changes to their city's infrastructure.

The municipality of Cuenca has the right to make changes to the city's infrastructure. The network of government actors required to implement an infrastructure project in Cuenca include the Mayor of Cuenca, the Mobility Department (DMT), the public mobility company (EMOV EP), and the Urban Planning Department (SEGEPLAN) (Cazorla, 2021). The network of actors can also include the National Transit Agency (ANT) who receives funds from a national level (Cazorla, 2021). Figure 2.6 illustrates the relations between these stakeholders.

Figure 2.6

Map of the Formal Relations Between Stakeholders



Note. The team modified this figure from "A Holistic Decision-Making Process to Improve the Productivity of Public Transportation in Cuenca-Ecuador," 2021.

Besides governmental actors, another relevant actor to improve accessibility in Cuenca is CONADIS, which is the National Council for Disability Equality in Ecuador. The mission of CONADIS is to "Formulate, mainstream, observe, monitor and evaluate public policies on disabilities" (CONADIS, 2022). CONADIS is the leading entity to focus on rights for people with disabilities in the country (Godoy Padilla, 2017). They have legal mandates to dictate policies, coordinate public and private actions, and promote research on disabilities throughout the country (Godoy Padilla, 2017). Since this organization advocates for public policy changes regarding people with disabilities, they are one of the stakeholders involved with implementing a solution to improve street-level accessibility in Cuenca.

Additionally, students from local universities are stakeholders that can advocate to improve accessibility in Cuenca, specifically students within urban development programs. These students will be the ones in the future to design sidewalks in the city; therefore, it is imperative that they learn how to properly design street-level infrastructure to be accessible to everyone, regardless of their mobility level.

2.7. Summary

Taking into consideration the success of Project Sidewalk in other cities to address street-level accessibility and the issues that Cuenca is currently facing, the team investigated the logistics behind implementing Project Sidewalk in Cuenca. The team previously researched through academic articles for low-cost solutions to address the issue of accessibility in Cuenca and found Project Sidewalk the most feasible of those solutions. Accessibility is important because it represents inclusion for individuals of all mobility levels and assures them that government officials are taking their needs into consideration. EMOV EP served as the project's sponsor and provided connections to data that the team could analyze, as well as expert insight regarding which neighborhoods to observe. In the end, the team implemented Project Sidewalk in Cuenca and determined the most effective strategies to engage communities in Cuenca.

3.0 Methodology

The goal of this project was to assist EMOV EP in their efforts to address street-level accessibility in Cuenca by implementing Project Sidewalk and determining methods to engage the community. Three objectives helped to accomplish this goal:

Objective 1: Understand Cuenca's street-level accessibility challenges

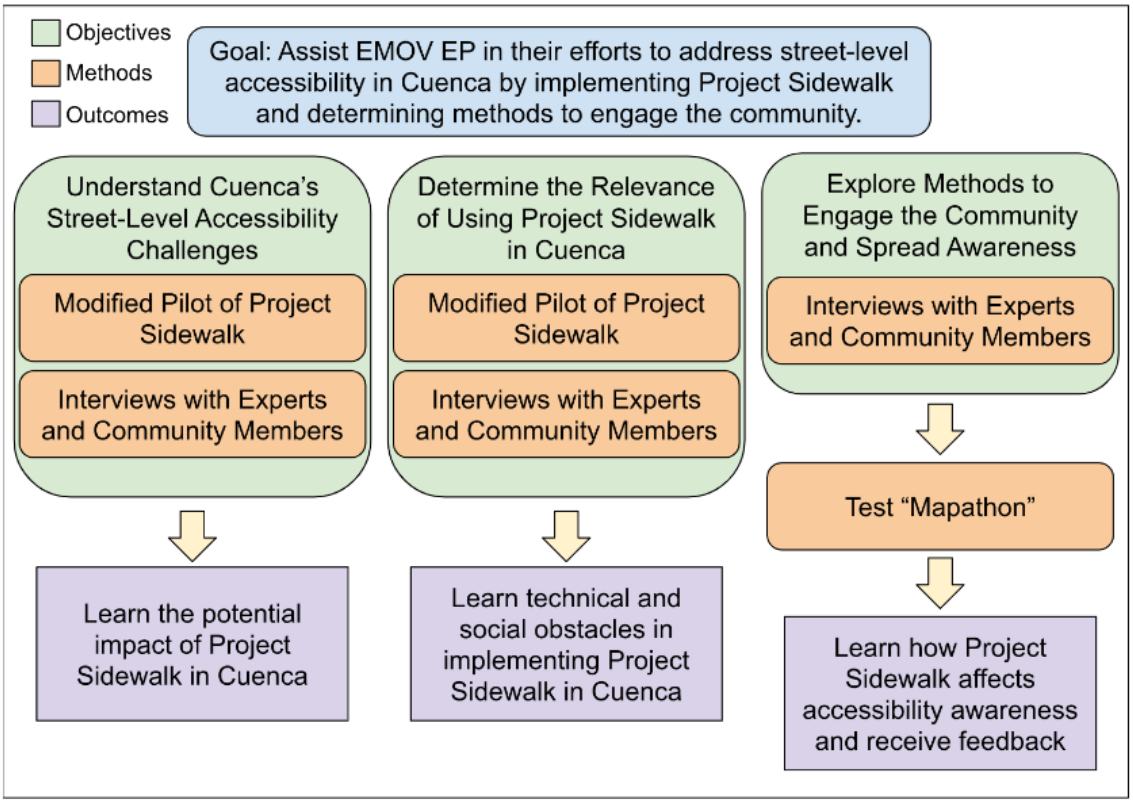
Objective 2: Determine the relevance of using Project Sidewalk in Cuenca

Objective 3: Explore methods to engage the community and spread awareness.

To fulfill these objectives, the team utilized two main methods. The first method was to conduct a modified pilot of Project Sidewalk in Cuenca, while the second was to interview members of the community and various experts in infrastructure, community engagement, and Project Sidewalk. Figure 3.1 outlines the project's goal, objectives, methods, and outcomes.

Figure 3.1

Project Goal, Objectives, Methods, and Outcomes



3.1. Conduct a Modified Pilot of Project Sidewalk

The team's first method to conduct a modified pilot of Project Sidewalk addressed their first and second objectives. The pilot included systematic observations of six different neighborhoods in Cuenca. In five of the neighborhoods, team members observed five streets, while the sixth neighborhood consisted of only one 850m-length street, for a total of 26 streets. The 850m street is Luis Cordero, and the team chose to observe this area differently because it is a long and hilly street with sloped sidewalks. Table 3.1 lists the six neighborhoods the team observed and the number of streets they walked in each neighborhood.

Table 3.1

Neighborhoods the Team Observed

Neighborhood	Number of Streets Observed
University of Azuay	5
Parque Calderón	5
Ave. Solano	5
Calle Larga y Benigno Malo	5
Quinta Chica	5
Luis Cordero	1

The team selected these neighborhoods based on recommendations from its sponsor, EMOV EP. Each neighborhood represents a different section of the city, creating a representative sample of Cuenca as a whole. For instance, the Parque Calderón and Calle Larga neighborhoods are in the bustling city center, while the University of Azuay and Quinta Chica neighborhoods are on the outskirts of the city. EMOV EP recommended some of the neighborhoods because they are notorious for their bad sidewalks (i.e., Quinta Chica). In other neighborhoods, the government recently updated infrastructure (i.e., Parque Calderón).

The observational method included taking note of every time a "Project Sidewalk" label emerged in Cuenca's streets. On Project Sidewalk's website, users can "drag and drop" one of eight different labels onto a street map, provided by Google Street View (GSV). Each of these labels represents an accessible or inaccessible sidewalk characteristic. The labels are curb ramp, missing curb ramp, obstacle in path, surface problem, no sidewalk, crosswalk, pedestrian signal, and other. During their modified pilot of Project Sidewalk, team members counted the

number of times they saw each of these labels in-person in Cuenca's neighborhoods and recorded these results in a worksheet rather than in the Project Sidewalk application.

For these in-person observations, the team split into two groups. Each group claimed one side of the street. In each group, one person took photos of the labels, while the other kept track of the number of each label observed. The team decided to use this approach because having two ways of collecting data allowed them to obtain higher-accuracy results. The team used a worksheet to document their findings and filled out one worksheet for each neighborhood. Table 3.2 depicts an example worksheet.

Table 3.2

Observational Worksheet

	Neighborhood:											
	Street Name	Street 1		Street 2		Street 3		Street 4		Street 5		Total Distance
	Distance (m)											
	Strategy of Observation	GSV	In-Person	GSV	In-Person	GSV	In-Person	GSV	In-Person	GSV	In-Person	
Project Sidewalk Label	Curb Ramp											
	Missing Curb Ramp											
	Obstacle in Path											
	Surface Problem											
	No Sidewalk											
	Crosswalk											
	Pedestrian Signal											Total In-Person Labels
	Other											
	Total											

Section 4.1 includes the full analysis from the observational worksheets. With these observations, the team gained first-person experience with inadequate infrastructure for those with mobility impairments. Knowing this, the team could see the potential positive impact of Project Sidewalk in Cuenca. Additionally, the in-person observational data would provide evidence in support of the team's final recommendations to their sponsor, EMOV EP.

After completing their in-person observations, the second part of the modified pilot test of Project Sidewalk included comparing the current sidewalks to their Google Street View (GSV) counterparts. Since GSV for Cuenca is from 2015, the team anticipated discrepancies between the digital and in-person streets. Thus, the team virtually "walked" the same paths they observed in person and again counted the number of each type of label they encountered. The team used the same worksheet as the in-person observations to document their findings. This addressed the second objective, "determine the relevancy of using Project Sidewalk in Cuenca,"

as the team calculated percentages of difference between reality and GSV. If the virtual and in-person streets varied significantly, Project Sidewalk (which uses GSV to collect data), would be ineffective for Cuenca. Table 3.3 shows the differences table used to determine the percentage difference for each street and neighborhood.

Table 3.3

GSV Differences Worksheet

	Neighborhood:						
	Differences	Street 1	Street 2	Street 3	Street 4	Street 5	Total
Project Sidewalk Label	Curb Ramp						
	Missing Curb Ramp						
	Obstacle in Path						
	Surface Problem						
	No Sidewalk						
	Crosswalk						
	Pedestrian Signal						
	Other						
	Total Differences						

To calculate percentages of difference for every street/neighborhood observed, team members input data from their tables in the following equation:

$$\frac{\text{Total Number of Differences Between GSV and In-person}}{\text{Total Number of In-person Labels}}$$

Using this calculation, the team was able to quantify the accuracy of GSV in a subset of the city, thus learning about the technical obstacles this discrepancy would pose.

3.2. Interviews with Experts and Community Members

The second method of the project required the team to conduct interviews with two groups of people: experts and community members. Experts consisted of individuals with knowledge in the following fields: infrastructure, infrastructure pipeline, Project Sidewalk, or community engagement. Community members consisted of individuals who live in Cuenca, with a range of ages and mobility levels. Table 3.4 contains a full table of interviews, including the interviewee, the date of the interview, if the interviewee was an expert or community member, their expertise/mobility level, and the appendix which contains the questions the team asked them.

Table 3.4

Interviews the Team Co-Conducted in Cuenca, Ecuador

Interviewee	Date	Expert/Community Member	If expert, specify expertise. If community member, specify mobility level.	Appendix
Prof. Orellana & Maria Elisa Bustos	March 21st	Expert	Infrastructure	A
Jon Froehlich	March 21st	Expert	Project Sidewalk	D
Prof. Carla Hermida	March 23rd	Expert	Infrastructure	A
Gustavo Morejon	March 24th	Expert	Community Engagement	E
Prof. Israel Idrovo	March 28th	Expert	Infrastructure	A
Prof. Larriva	March 29th	Expert	Infrastructure	A
Juan Carlos Freiré	March 29th	Community Member	Wheelchair user	C
Viviana Cordero	March 29th	Expert	Infrastructure	A
Marce Gutierrez	April 10th	Community Member	Fully mobile; son is a wheelchair user	C
Lesly Garacochea	April 18th	Community Member	Fully mobile	C

Guilherme Chalhoub	April 19th	Expert	Infrastructure Pipeline	B

Each interview took approximately 60 minutes, but time varied depending on the length of participant responses. The interviews took place in an agreed-upon location (decided by the interviewer and interviewee on a case-by-case basis). The team obtained informed consent from all participants (given orally) and audio recorded the interviews with participant permission. Three researchers attended each interview. The team conducted the interviews in a semi-structured manner, asking all members of a group the same basic questions. Semi-structured interviews granted the researchers the opportunity to ask follow-up questions and clarifications, which encouraged participants to share their unique perspectives in greater detail (Beebe, 2014). If the interviewee indicated that they were comfortable speaking English, the researchers conducted the interview in English, otherwise it was in Spanish. One team member took notes, providing a detailed summary of the participant's responses. After each interview, the researchers reviewed the audio recording, and transcribed the whole interview.

The researchers used both expert and snowball sampling to obtain participants for the first set of interviews (experts) (Gill, 2020). These sampling methods enabled researchers to talk to specialists in the urban development field who were able to recommend additional experts in their network for further interviews. The team conducted the second set of interviews with community members (those with varying levels of mobility impairments). The researchers used snowball sampling by asking University of Cuenca professors to connect them with people with disabilities and others who work closely with people with disabilities.

To get more insight on Cuenca's street-level accessibility issues, the researchers asked the infrastructure experts questions about past and current accessibility initiatives in Cuenca, as well as their opinions on the city's worst situation with respect to accessibility, as seen in questions 3-6 of Appendix A. To the expert in the infrastructure pipeline, the researchers asked him what he has noticed about sidewalks and pedestrians when traveling the city, the stakeholders involved in making changes to the city's sidewalks, and the pipeline from idea to action, as seen in questions 3-5 in Appendix B. Lastly, the researchers asked community members the issues they have experienced while traveling the city and the adequateness of auditory cues and crossing time at intersections, as seen in questions 4-6 in Appendix C.

To further determine the relevance of using Project Sidewalk in Cuenca, the team needed to learn about the social and technical obstacles implementing Project Sidewalk would face. More specifically, the team needed to know if infrastructure experts and the community

would be willing to audit streets in Project Sidewalk, as seen in questions 7-8 in both Appendix A and C. Additionally, the team needed to know how the municipality could use the data from Project Sidewalk. The researchers asked the expert in the infrastructure pipeline how the municipality can use the data from Project Sidewalk to make changes in Cuenca, as seen in questions 6-7 in Appendix B. Lastly, the team needed to understand the final technical obstacles implementing the software in Cuenca would face. To accomplish this, the team asked the creators of Project Sidewalk about the necessary steps to set up a server in Cuenca, as seen in Appendix D.

The third objective of this project was to determine the most effective methods to promote community engagement and spread awareness of Project Sidewalk in Cuenca. Because the success of Project Sidewalk relies heavily on community engagement, this objective was critical to the project's goal. Based on the team's research, there are many effective strategies for engaging a community. For Project Sidewalk, the team focused on engaging populations such as people with disabilities, the elderly, and local university students. The team also needed to identify community leaders who were willing to promote this software to their respective community members. There are many options for promoting engagement with Project Sidewalk among these target populations. For instance, hosting mapathons can bring people together to audit the streets. Local university students can receive academic credits for completing auditing "missions" on Project Sidewalk.

To determine which engagement method was most effective, the team interviewed community members and experts in infrastructure, the infrastructure pipeline, and community engagement. The team asked experts in infrastructure and community members their ideas for engaging the community, as seen in question 9 in Appendix A and C. Since many of the experts in infrastructure were professors at local universities, the researchers asked them how to get their students to participate in auditing streets in Project Sidewalk, as seen in question 10 in Appendix A. The team asked the experts in the infrastructure pipeline how the mu nicipality can promote community engagement with this application, as seen in question 8 in Appendix B. Lastly, the team gained insight from an expert in community engagement on how they were able to engage their own communities in the past and recommendations they provided to engage the community with this application, as seen in questions 3-6 in Appendix E. The experts and community members connected team members with additional contacts relating to community engagement to gain more insight on this topic.

Based on what they learned during these interviews, the team focused their community-engagement efforts on three groups of people: college students, senior citizens, and those with

disabilities. Through these interviews, the team was able to organize their first mapping event, and thus third method, to begin the auditing process among the chosen individuals, encouraging the completion of “mapping missions” in Project Sidewalk’s Cuenca server. Ideally, the team’s initial event would spark future larger events to occur throughout following years.

3.2.1. Coding

To analyze the qualitative data obtained through interviews with experts and community members, the team utilized coding. After completing all of the interviews, the team used the audio recordings and speech-to-text software to transcribe each interview. Each transcription contained everything the interviewers and interviewee said during the interview. Coding is a process where researchers look for common themes in qualitative data. Team members identified recurring ideas and themes across all eleven interviews, and they also determined relevant themes within each group of interviewees: experts and community members. To begin the coding process, the team split into two groups and independently coded one of the expert interview transcripts. They separately identified themes in the interviewee’s responses by highlighting the text in different colors and making margin notes. Afterwards, the two groups compared the themes they identified to validate their interpretations. The team repeated this process for one of the community member interviews. Then, the team used these themes to code the remaining interview transcripts. After coding all of the transcripts, the team performed content analysis, transforming the qualitative data to quantitative results. For instance, team members calculated the frequency of themes across all of the transcripts (i.e., did different participants give similar responses to each question?). Finally, the team produced a data display to illustrate their findings from the coding and content analysis.

3.3. Test “Mapathon” at the University of Azuay

The team’s next method, the “mapathon”, served as a form of community engagement by introducing the Project Sidewalk application to the students and faculty at the University of Azuay. A mapathon is an event with a group of people who audit streets at the same time via Project Sidewalk. On April 24th, the team conducted a test mapathon with an urban studies class at the university. The goal of this event was to promote the application and receive feedback on the explanation of the auditing process that the team presented to the class.

Eighteen students from Prof. Maria Isabel Carassco’s urban studies class attended the event and audited 14 streets in El Centro. The team provided a brief introduction of Project

Sidewalk and its purpose of implementation in Cuenca, then instructed the class to complete the tutorial on the Project Sidewalk website. The tutorial goes over each label of the application and instructs the user on the correct way to apply each one. It also covers how to rate each label and move around in the application. After the class completed the tutorial, the team gave a presentation on the “Dos & Don'ts” when labeling on Project Sidewalk. Once the students finished their training, the team explained certain accessibility characteristics that are unique to Cuenca that they noticed during their field audit. For example, they noted the numerous garage entrances in Cuenca that create a surface problem yet there is no specific label for them in Project Sidewalk. Because of this, they instructed the students to label the garage entrances as surface problem and use the Project Sidewalk tag “garage entrance”. Since the university students are familiar with the general Cuenca area, the team asked them to note if the GSV representation of certain streets was inaccurate. If the street was not the same in person, they used the label “other” along with a comment noting the specific inaccuracy. The team instructed the class to classify narrow sidewalks as surface problems, along with classifying unlevel curb ramps as unpassable, which translates to a rating of a 4 or 5 out of 5.

During the event, the team recorded questions that the students had about the auditing process. At the conclusion of the mapathon, two team members conducted a short semi-structured interview with one of the students in the class to learn how using Project Sidewalk affected their awareness of the accessibility challenges in Cuenca and any feedback they have. They asked the following three questions:

- After auditing streets in Cuenca, do you think you are more aware of the accessibility challenges that Cuenca faces?
- Do you have any feedback for us to improve your understanding of how to audit streets?
- Do you prefer the word “banqueta” or “acera” for sidewalk?

The last question was to clarify what Ecuadorians normally call sidewalks since there is more than one direct translation of the word to Spanish. This information is useful for Project Sidewalk, since it intends to accommodate their program to Ecuadorian Spanish.

Using the feedback they received from the students, the team proceeded to plan the larger scale mapathon which took place on May 4th/5th.

3.4. Summary

The success of Project Sidewalk heavily depends on community engagement and the accuracy of current street mapping, which were driving factors in the team's selection of objectives and methods. The team's pilot test of Project Sidewalk served as a strategy for collecting street-level accessibility data for a sample-sized area of Cuenca and also for validating the 2015 Google Street View (GSV). The team's second method, interviews with experts and community members, addressed all objectives. Ultimately, the interviews led to the team hosting a test mapathon at the University of Azuay. The subsequent chapter discusses the results the team derived from these methods.

4.0 Results and Analysis

This chapter focuses on the results of the team's research regarding the implementation of Project Sidewalk in Cuenca. During their time in Cuenca, the team completed a series of observations and interviews. This chapter discusses the results of observations, highlighting the positive and negative aspects of the sidewalks in each neighborhood and specific areas that need the most improvement. The chapter also contains the current sidewalks' differences from Google Street View (GSV), which Google last updated in 2015. Then, the chapter details an analysis of the team's interviews with experts and community members, establishing common themes within each group. Finally, this chapter describes efforts to engage the community in auditing on Project Sidewalk.

4.1. Observational Data Analysis

To better identify Cuenca's street-level accessibility challenges, the team observed six different neighborhoods throughout the city, focusing on five streets within each neighborhood, with the exception of Luis Cordero where the team focused their observations on one street. Through these observations, the team identified many negative sidewalk conditions and specific streets that need improvement. Team members looked for seven different categories of sidewalk attributes, which correspond to the labels on Project Sidewalk's website (see Figure 4.1 and 4.2). The labels represent both positive and negative aspects of street-level accessibility. The positive labels are curb ramps, crosswalks, and pedestrian signals, while the negative labels are missing curb ramps, obstacles in path, surface problems, and no sidewalks. Appendix F lists the worksheets the team filled out for each neighborhood, and the number of each label that they encountered.

Figure 4.1

Photos of Positive Labels

Figure 4.2

Photos of Negative Labels

In Project Sidewalk, users can drag and drop each label onto Google Street View and provide corresponding ratings (e.g., a surface problem may be a “4” out of “5” in terms of severity, 5 being the most severe). However, for the purpose of their observations, the team

was only concerned with the final count of labels rather than their rating. Thus, they simply counted each time they saw a Project Sidewalk label in-person. For example, a usable curb ramp and an unusable curb ramp would have been equally rated in these observations. The subsequent sections discuss three out of the six neighborhoods where the teams conducted their observations: two with poor street-level accessibility and one with exemplary street-level accessibility.

4.1.1. University of Azuay Neighborhood

The first neighborhood that the team visited was the area surrounding the University of Azuay. EMOV EP recognizes this neighborhood for its hilly and uneven sidewalks, so the team wanted to investigate the conditions of the area. Figure 4.3 displays the walking path that the team followed during their observations. Throughout the 1530 meters the team walked, they identified 147 total labels, positive and negative. Table 4.1 includes the breakdown of meters for each of the six streets that the team observed, as well as the number of labels they identified for each of the streets. This subsection provides an analysis of the varying levels of accessibility per street in the University of Azuay neighborhood.

Figure 4.3
Map of Observational Path for the University of Azuay Neighborhood

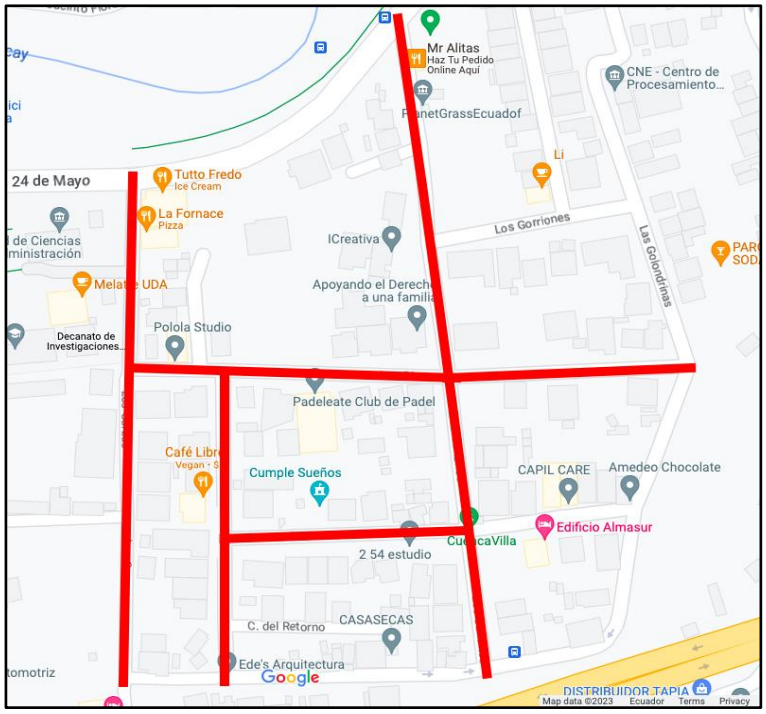


Table 4.1

Distance Covered and Labels for each University of Azuay Street

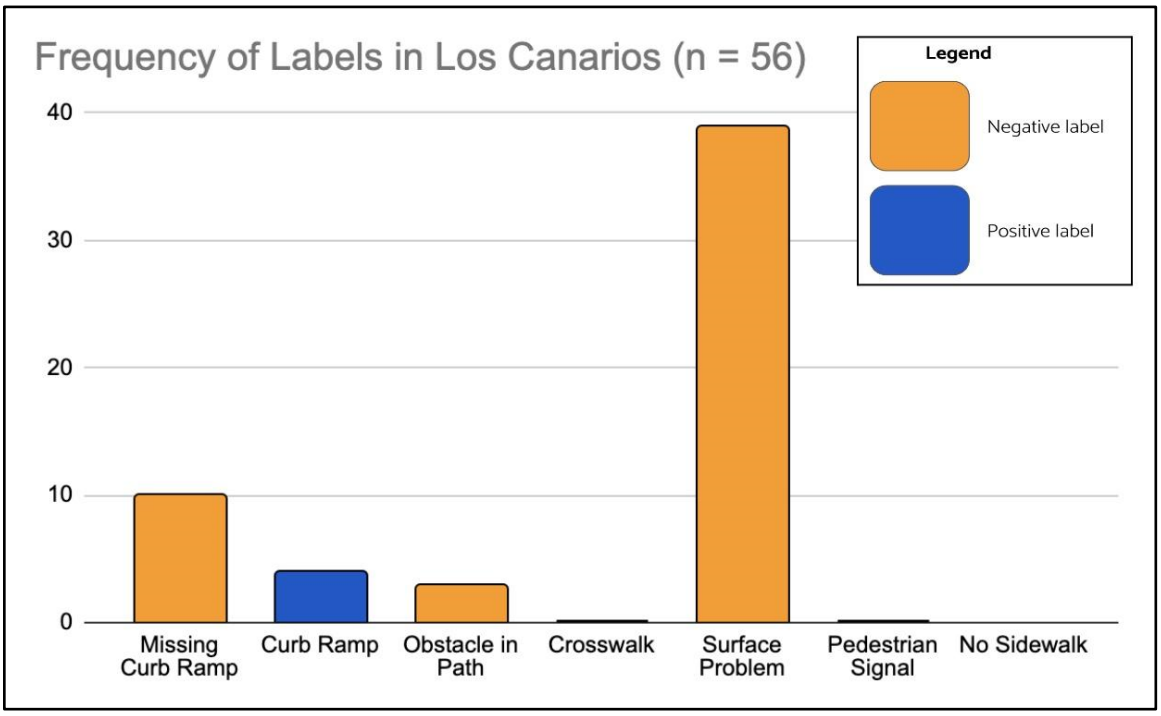
Street Name	Distance Observed (meters)	Total Number of Labels	Number of Negative Labels	Number of Positive Labels
Las Garzas	350	17	12	5
Los Cisnes	350	31	31	0
Del Chirote	190	19	17	2
Los Canarios	400	56	52	4
Las Gaviotas	240	24	24	0
Total	**1530**	**147**	**136**	**11**

Table 4.1 clearly indicates that there are more negative than positive labels on every street in this neighborhood. There was a total of 136 negative labels and 11 positive labels throughout the entire neighborhood.

Figure 4.4 illustrates the findings from the observations on the Los Canarios street, which had the most labels. Appendix G contains the graphs for the rest of the streets in the neighborhood. In Los Canarios, the most prevalent issue the team encountered were surface problems, followed by missing curb ramps. The team did not find any crosswalks or pedestrian signals, so there was only one blue/positive bar in the graph (for curb ramps). The results from Figure 4.4 indicate that Los Canarios is not an accessible street for individuals with mobility impairments. The number of surface problems (almost 40), make traveling the sidewalks very difficult for an individual in a wheelchair, pushing a stroller, or experiencing otherwise restricted mobility.

Figure 4.4

Frequency of Positive and Negative Labels in Los Canarios



In addition to in-person observations from actually walking the five streets, the team also virtually “walked” through the University of Azuay neighborhood using Google Street View (GSV). The purpose of the virtual walks was to record the number of labels on GSV that were not the same as the in-person findings. Table 4.2 lists the number of GSV differences for each of the streets in the University of Azuay Neighborhood. It also breaks down these GSV differences into two categories: setbacks and improvements since 2015. A setback is a condition of the sidewalk that is worse currently than it was in 2015, and an improvement is a condition that has improved since 2015.

Table 4.2

GSV Comparison for University of Azuay

Street	In-Person Labels	GSV Differences	Setbacks Since 2015	Improvements Since 2015	Percentage of Difference
Las Garzas	17	9	4	5	53%
Los Cisnes	31	2	0	2	6%
Del Chirote	19	4	3	1	21%
Los Canarios	56	15	11	5	27%
Las Gaviotas	24	5	1	4	21%
Total	**147**	**36**	**19**	**17**	

4.1.2. Quinta Chica Neighborhood

The next neighborhood that the team visited was Quinta Chica. EMOV EP recommended this neighborhood, as it is notorious for its poor sidewalk conditions. Quinta Chica is in the outskirts of Cuenca, so observing it helped to make the team's sample more representative of the entire city. Figure 4.5 displays the walking route the team followed during their observations. In the Quinta Chica neighborhood, the team conducted 1490 meters of observations, identifying a total of 186 labels, positive and negative. Table 4.3 includes a breakdown of each of the five streets the team observed.

Figure 4.5

Map of Observational Path for the Quinta Chica Neighborhood

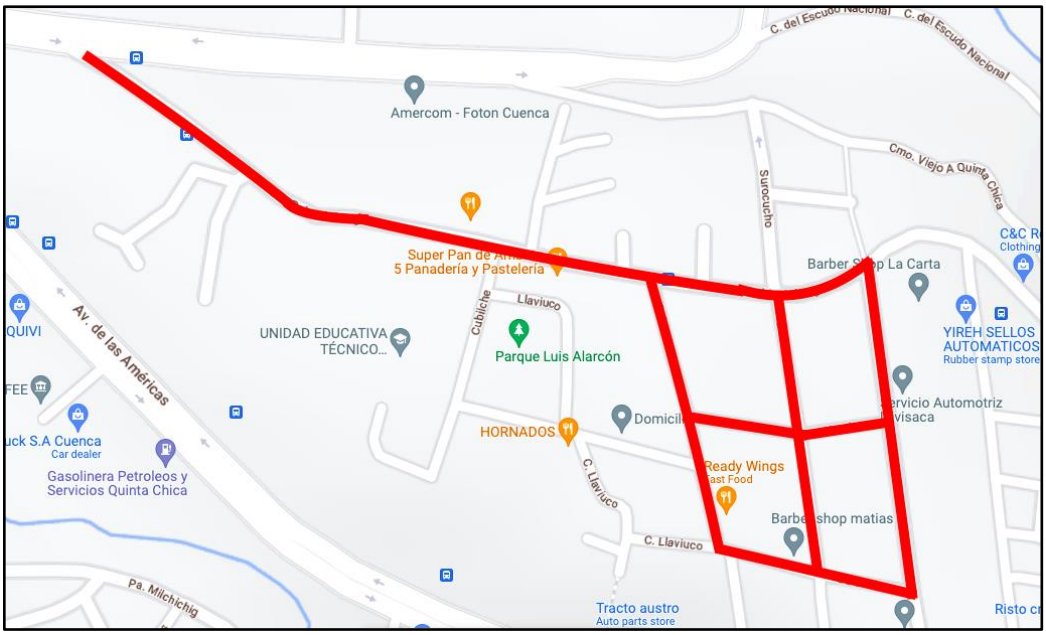


Table 4.3

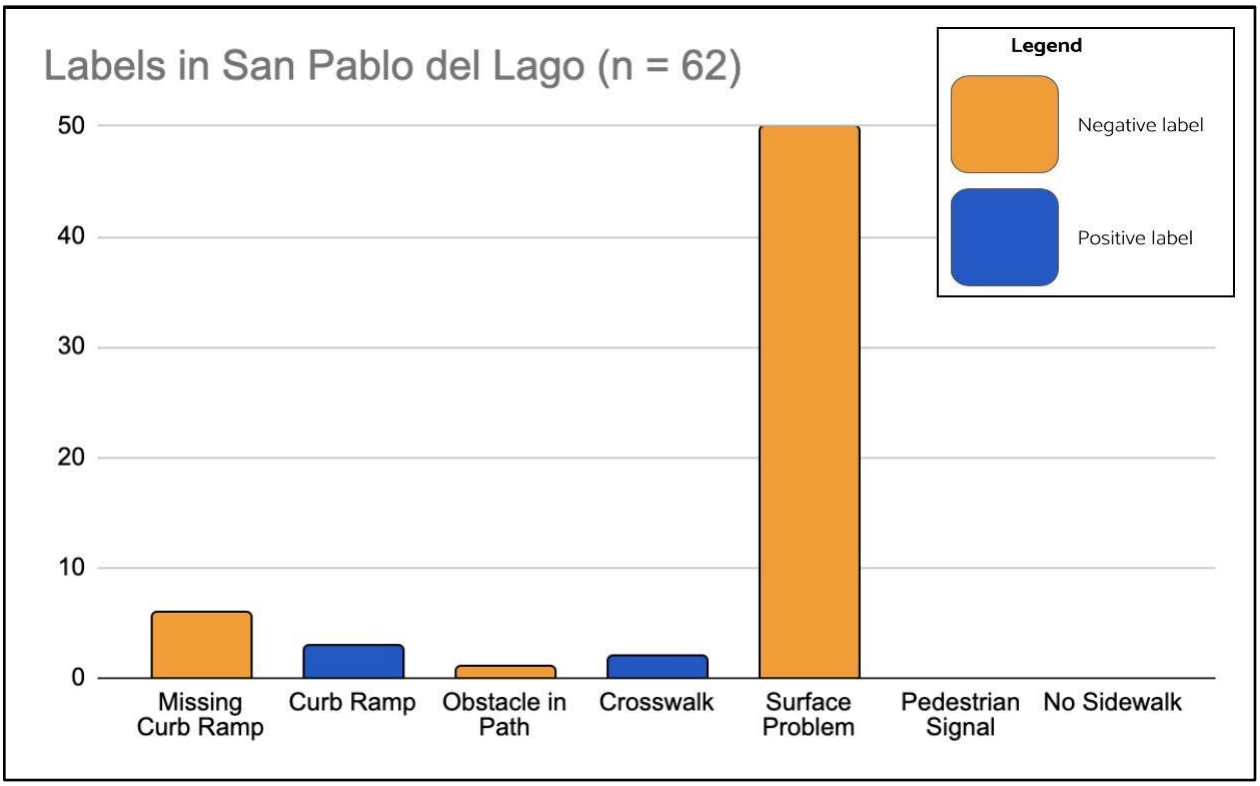
Distance Covered and Labels for each Quinta Chica Street

Street Name	Distance Observed (meters)	Total Number of Labels	Number of Negative Labels	Number of Positive Labels
San Pablo del Lago	550	62	57	5
La Toradora	240	54	53	1
Cuicocha	350	26	18	8
Yambo	150	8	7	1
Surochucho	200	36	32	4
Total	**1490**	**186**	**111**	**75**

In the Quinta Chica neighborhood, all the streets contained more negative than positive labels. The team found “surface problems” and “no sidewalks” to be the most common labels in this neighborhood. The street with the most labels was San Pablo del Lago, which had 62 total labels, and 57 were negative. Figure 4.8 provides a breakdown of the labels on this inaccessible street.

Figure 4.6

Frequency of Positive and Negative Labels in San Pablo del Lago



The team also compared the current state of Quinta Chica's sidewalks to the 2015 version evident in GSV. Table 4.4 highlights the differences in each of the streets between now and then. As shown in the table, there were few changes in this neighborhood in the past eight years, and these differences are evenly split between setbacks and improvements. This supports the fact that the city has neglected this neighborhood which is strongly in need of improvement. This lack of change suggests that Project Sidewalk is a reliable way to audit Quinta Chica's streets.

Table 4.4

GSV Comparison for Quinta Chica

Street	In-Person Labels	GSV Differences	Setbacks Since 2015	Improvements Since 2015	Percentages of Difference
San Pablo del Lago	62	6	6	0	10%
C. la Toradora	54	4	0	4	7%
Cuicocha	26	3	2	1	12%
Yambo	8	0	0	0	0%
Surochucho	36	4	0	4	11%
Total	**186**	**17**	**8**	**9**	

4.1.3. Parque Calderón Neighborhood

The last neighborhood that the team visited was Parque Calderón. This area is in the center of Cuenca and must accommodate crowds. Figure 4.7 displays the walking route that the team followed during their observations, which totaled 1407 meters of observation. On their walk, the team found 152 labels, most of them being positive. Table 4.5 includes the breakdown of meters for each of the six streets that the team observed, as well as the number of labels they identified for each of the streets. This subsection provides an analysis of the varying levels of accessibility per street in the Parque Calderón neighborhood.

Figure 4.7

Map of Observational Route for the Parque Calderón Neighborhood

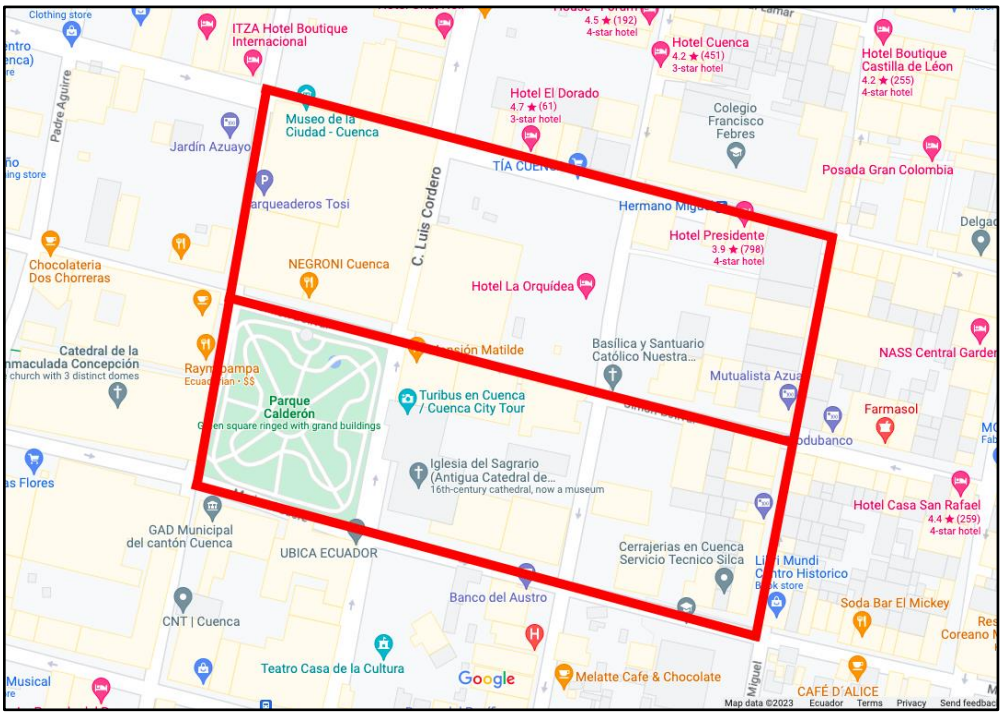


Table 4.5

Distance Covered and Labels for each Parque Calderón Street

Street Name	Distance Observed (meters)	Total Number of Labels	Number of Negative Labels	Number of Positive Labels
Benigno Malo	221	22	0	22
Gran Colombia	325	31	13	18
Hermano Miguel	215	28	3	25
Simón Bolivar	329	23	0	23
Mariscal Surce	327	48	3	45
Total	**1407**	**152**	**19**	**133**

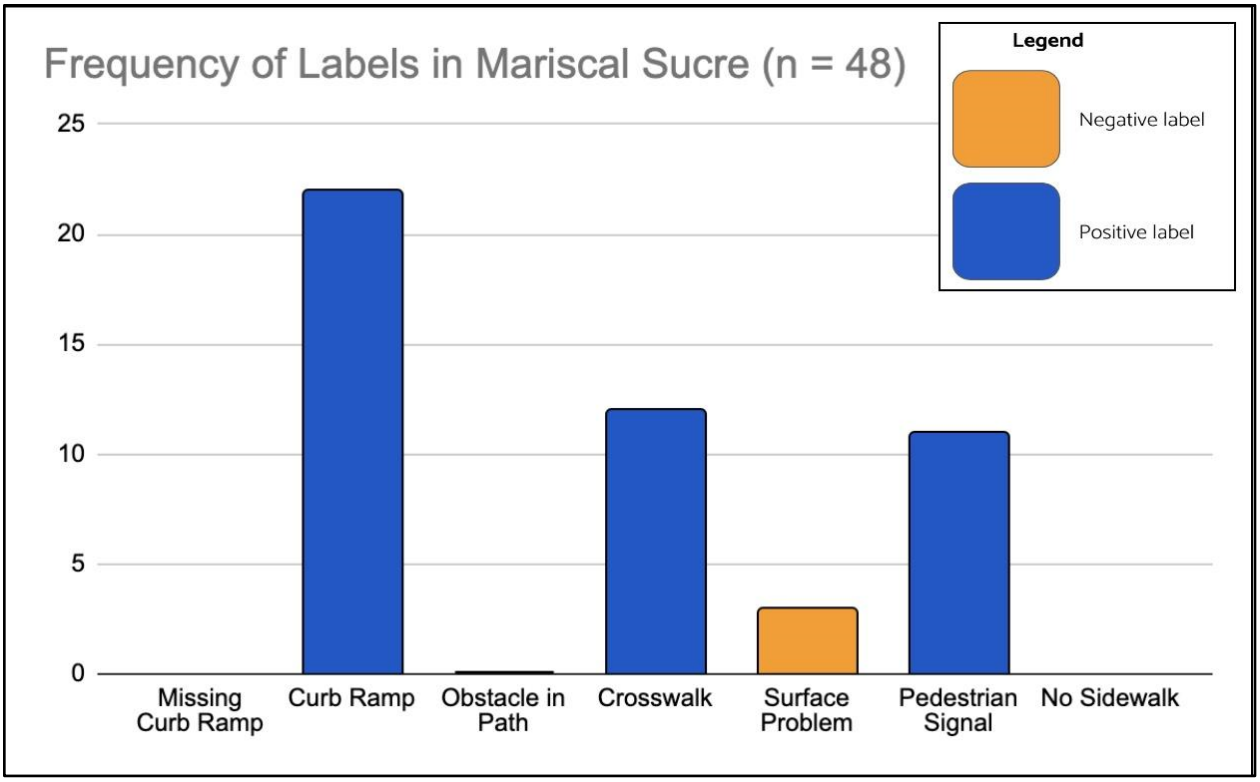
For all the streets in the Parque Calderón neighborhood that the team observed, they found more positive labels than negative labels. Out of the 152 labels that the team identified, only 19 were negative, which is the opposite outcome from the observations in the University of

Azuay area. Specifically, the streets “Benigno Malo” and “Simón Bolivar” contained no negative labels, making them very accessible for individuals with mobility impairments. The team further analyzed the data they collected in the Parque Calderón neighborhood.

For this neighborhood, the team used the same graphing metric as the University of Azuay neighborhood. Figure 4.8 depicts the findings for the Mariscal Sucre street. Appendix G contains the graphs for the rest of the streets in the neighborhood. As seen in Figure 4.8, the most common labels that the team encountered were curb ramps, followed by crosswalks, pedestrian signals, and lastly, surface problems. Most bars on this graph are blue, which indicates that the street segment is accessible. The high volume of curb ramps and low volume of surface problems are promising signs that an individual in a wheelchair could safely travel on this street.

Figure 4.8

Frequency of Positive and Negative Labels in Mariscal Sucre



The next step in the process was to use GSV to compare the observations the team conducted from their field audit. Table 4.6 lists the number of GSV differences for each of the streets in the Parque Calderón Neighborhood.

Table 4.6

GSV Comparison for Parque Calderón

Street	In-Person Labels	GSV Differences	Setbacks Since 2015	Improvements Since 2015	Percentages of Difference
Benigno Malo	22	0	0	0	0%
Gran Colombia	31	21	19	2	68%
Hermano Miguel	28	5	0	5	12%
Simón Bolivar	23	0	0	0	0%
Mariscal Sucre	48	1	1	0	2%
Total	**152**	**27**	**20**	**7**	

Out of the 152 in-person labels, the team found 27 different labels in GSV. Table 4.6 shows the percentages of difference for each street in the Parque Calderón neighborhood. Gran Colombia has by-far the highest percentage, that being 68%. The team learned that between GSV and present day, the city of Cuenca constructed the new tramline in 2020, which led to the streets being level with the sidewalks at intersections across the street Gran Colombia. As a result of the streets being level with sidewalks with the construction of the tramline, there were more curb ramps and crosswalks in GSV compared to present day. The rest of the percentages were low, with two of the equaling zero (for Benigno Malo and Simón Bolivar). Besides the disparity in C. Gran Colombia, the rest of the streets were representative with respect to GSV.

4.1.4. Comparison of All Neighborhoods

After analyzing the observational data by neighborhood, the team made comparisons and drew overarching conclusions. One important result observed across all streets was the number of negative labels (i.e., issues with the sidewalks that reduce accessibility) per kilometer (km). This statistic reveals how often obstacles emerge as someone is traveling down a given street. A person with impaired mobility should avoid a street with a high number of negative labels per km. The team calculated this rate for every street observed (26 total streets) and determined a threshold of 50 obstacles per km. If a street exceeded this threshold, the team deemed that street inaccessible. The team did not use a scientific metric to determine the

threshold value, but rather determined it based on their observations and overall perception of accessibly level within each neighborhood. Figure 4.9 highlights an example from one of the most inaccessible neighborhoods they observed, the University of Azuay.

Figure 4.9

Negative Labels per km in the University of Azuay Neighborhood

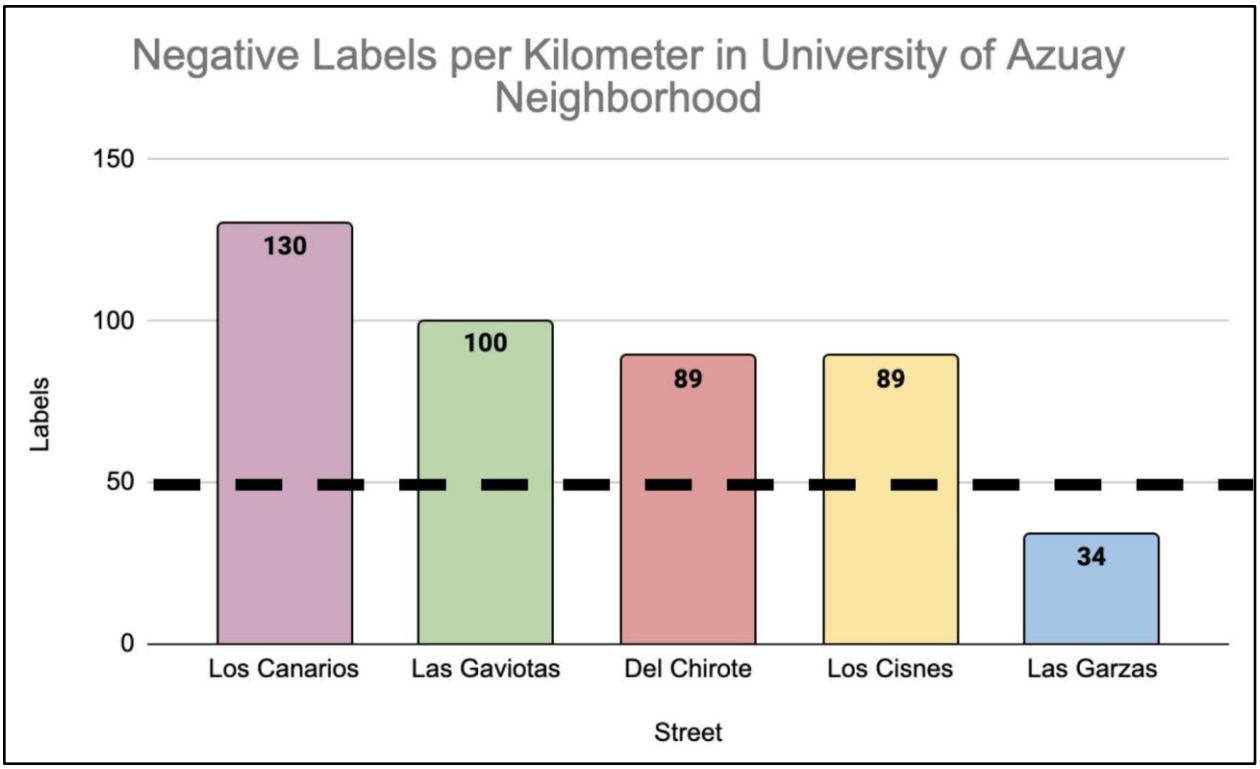


Figure 4.9 shows that almost all streets in the University of Azuay neighborhood are inaccessible, particularly Los Canarios, which contained 130 negative labels per km. All of these streets (except for Las Garzas) exceed the 50 negative labels per km metric, thus requiring significant improvement before an individual with impaired mobility can safely traverse their sidewalks.

Also, if a neighborhood exceeds the 50 negative labels per km threshold, the entire area is identified as inaccessible. Figure 4.10 highlights the number of negative labels per km in each neighborhood (calculated by dividing the total number of negative labels in the neighborhood by the total km traveled in that neighborhood).

Figure 4.10

Negative Labels per km in All Observed Neighborhoods

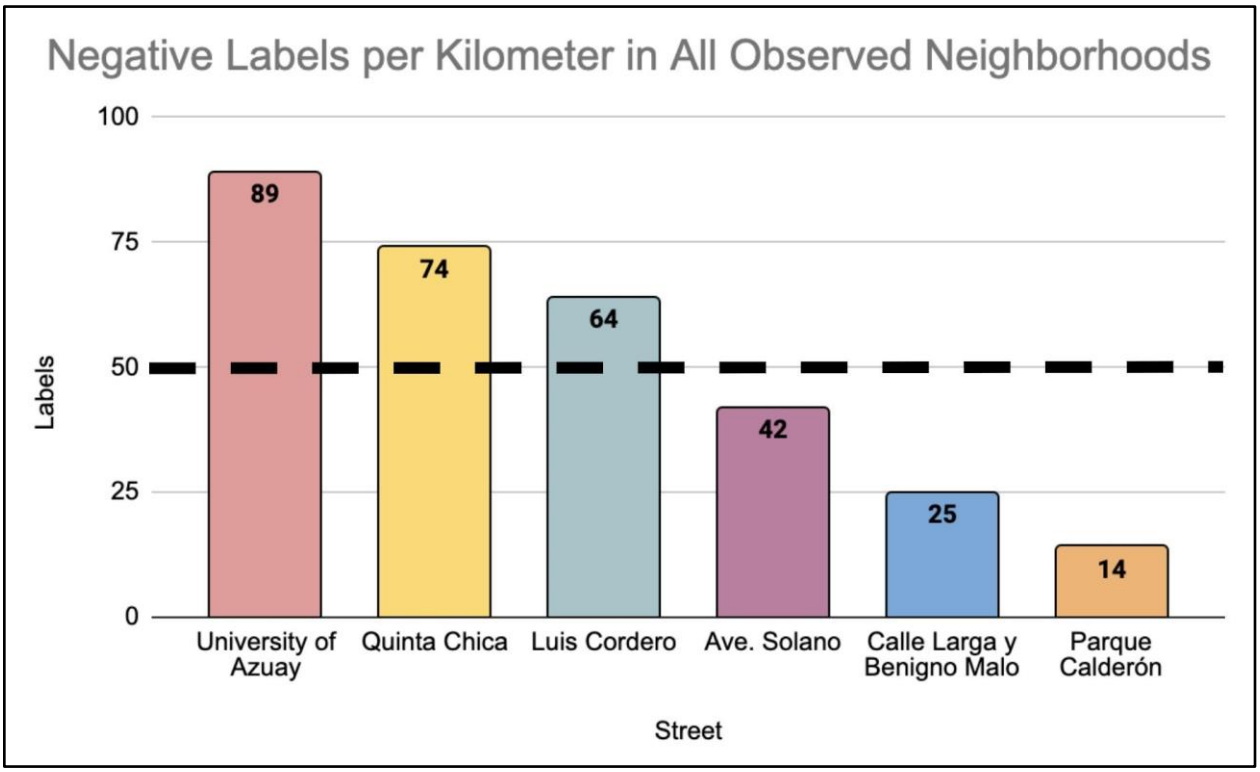


Figure 4.10 demonstrates that three of the six neighborhoods are inaccessible (averaging more than 50 negative labels per kilometer). The team hypothesized that certain characteristics of the neighborhoods affect this metric. For instance, the three accessible neighborhoods are near the city's center and in high-income areas. In contrast, the three inaccessible neighborhoods are located closer to the outskirts of the city and/or are lower-income neighborhoods. It seems like the sidewalks in wealthier, more-modernized areas are better maintained, which is not equitable.

Another important metric for all the neighborhoods is their differences from GSV. Every neighborhood has changed since 2015, when GSV last updated their data for Cuenca. However, some neighborhoods experienced more differences than others. As seen in Figure 4.11, the Luis Cordero and Quinta Chica neighborhoods have changed the least since 2015. Again, this may reflect a socioeconomic disparity, as both neighborhoods are lower-income and have seen few improvements or changes in the last eight years.

Figure 4.11

Percentages of Difference from GSV by Neighborhood

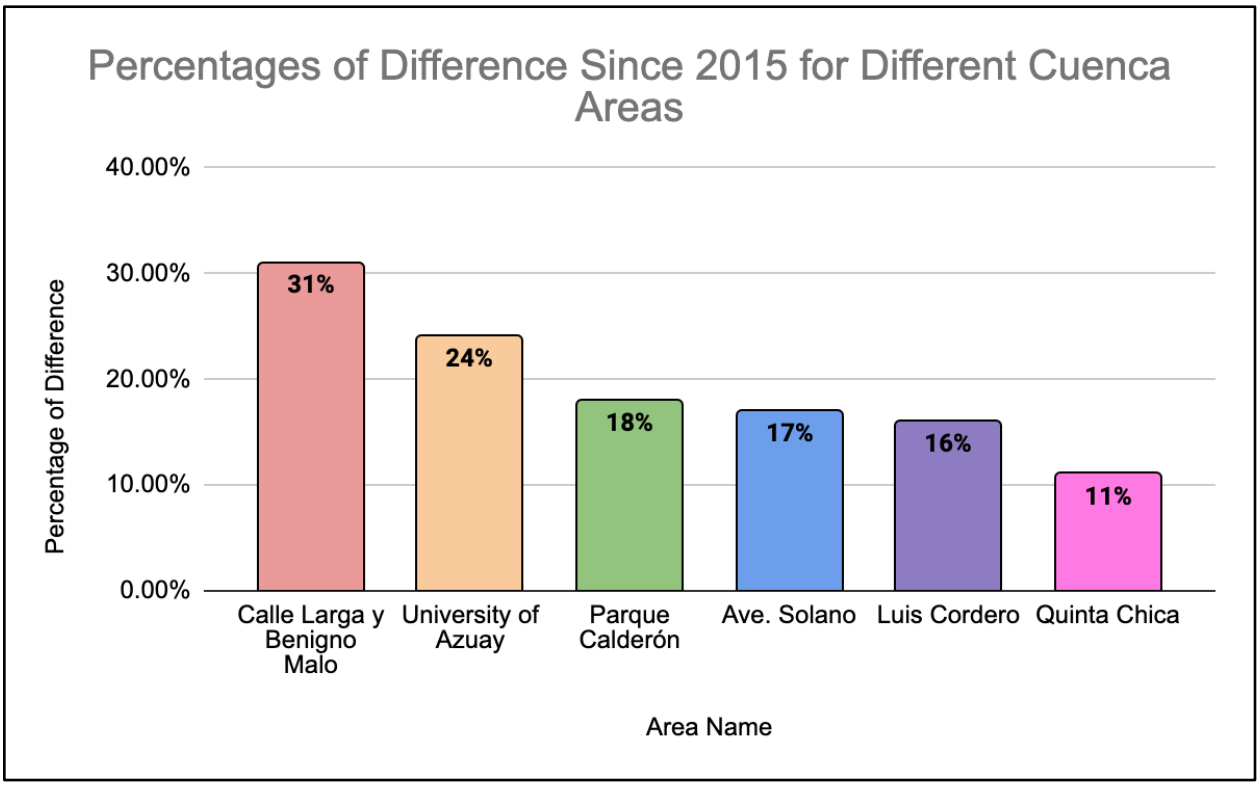


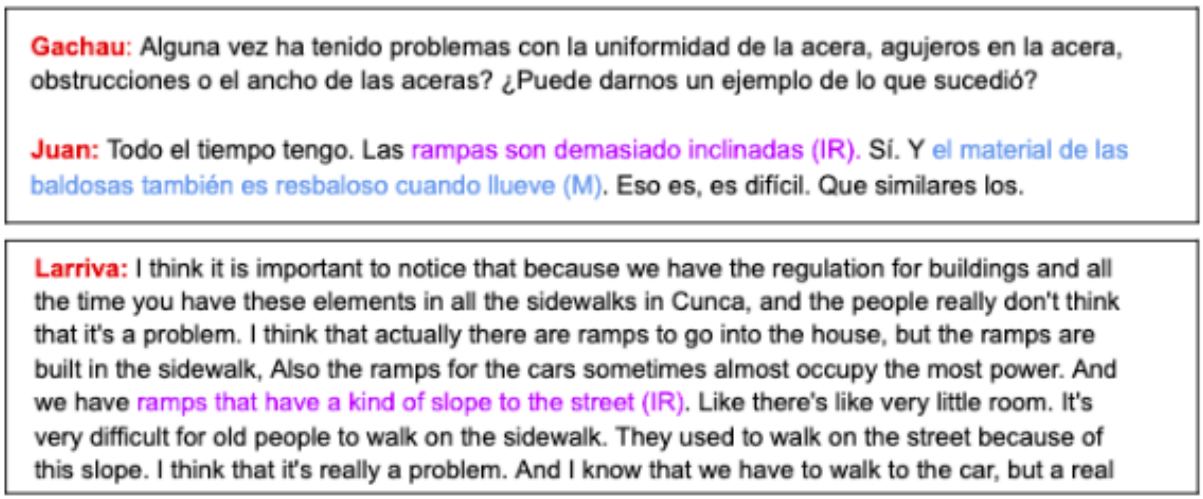
Figure 4.11 also highlights how the Calle Larga y Benigno Malo neighborhood has changed the most since 2015. Therefore, the team may recommend to the creators of Project Sidewalk that certain streets in this neighborhood be audited in-person rather than through GSV. Ultimately, the data collected during these observations informed the team's recommendations for their sponsor, EMOV EP, and Project Sidewalk's creators.

4.2. Interview Analysis

The team's objectives were to identify some of Cuenca's street-level accessibility challenges, determine the relevance of using Project Sidewalk in Cuenca, and determine methods to engage the community to audit streets within the application and spread awareness of it. To fulfill these objectives, the team conducted interviews with community members (particularly individuals with mobility impairments) and experts in infrastructure, the infrastructure pipeline, Project Sidewalk, and community engagement. These interviews allowed the team to gain a deeper insight on the potential impact of Project Sidewalk in Cuenca, the social and technical obstacles involved in implementing Project Sidewalk in Cuenca, and methods to engage the community to audit streets in Project Sidewalk, thus completing the first, second, and third objectives. After conducting a total of eleven interviews (eight with experts and three with community members), the team transcribed the interviews, coded the participants' responses, and analyzed the newly collected quantitative data. Transcriptions from each interview can be found in Appendix H. Figure 4.12 shows an example of this coding.

Figure 4.12

Example of Coding Across Interview Transcripts



The team coded for common responses to interview questions. Both experts and community members talked about obstacles they encounter when traveling on the sidewalks. The first excerpt in Figure 4.12 is from an interview with a community member who uses a wheelchair. In Spanish, he is describing difficulties with "rampas demasiado inclinadas," or ramps that are too steep. The team decided to code this in purple as "IR," meaning "inadequate ramps." In the second excerpt, from an interview with Professor Larriva at the University of

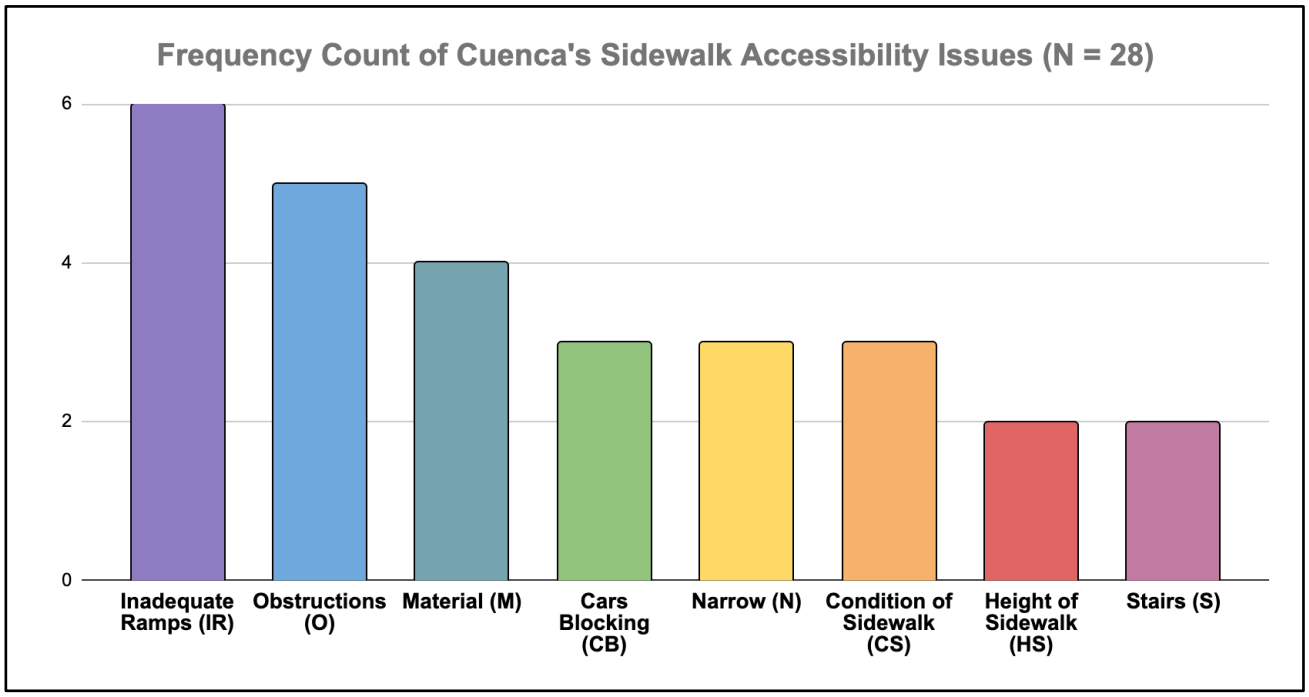
Cuenca, she also described ramps that are too sloped. Again, the team coded this as “IR.” Team members developed a code to represent other frequently mentioned sidewalk obstacles, including “M” for sidewalk material and “O” for obstructions, among others. As described in the following sections, team members tallied the number of interviewees that mentioned particular codes in their transcripts (e.g., six out of the nine interviewees reported cases of inadequate ramps (IR)).

4.2.1. Overall Themes

In both sets of interviews, the team asked similar questions to the interviewees. Based on the results of both sets of interviews, the team identified common themes and topics that the interviewees mentioned. The team drew three conclusions from both groups of individuals.

First, when the team asked all interviewees (except the expert in engaging the community and the creators of Project Sidewalk) questions regarding what sidewalk accessibility issues Cuenca faces, inadequate ramps was the most common response. Figure 4.13 shows this frequency count.

Figure 4.13
Frequency Count of Cuenca’s Sidewalk Accessibility Issues

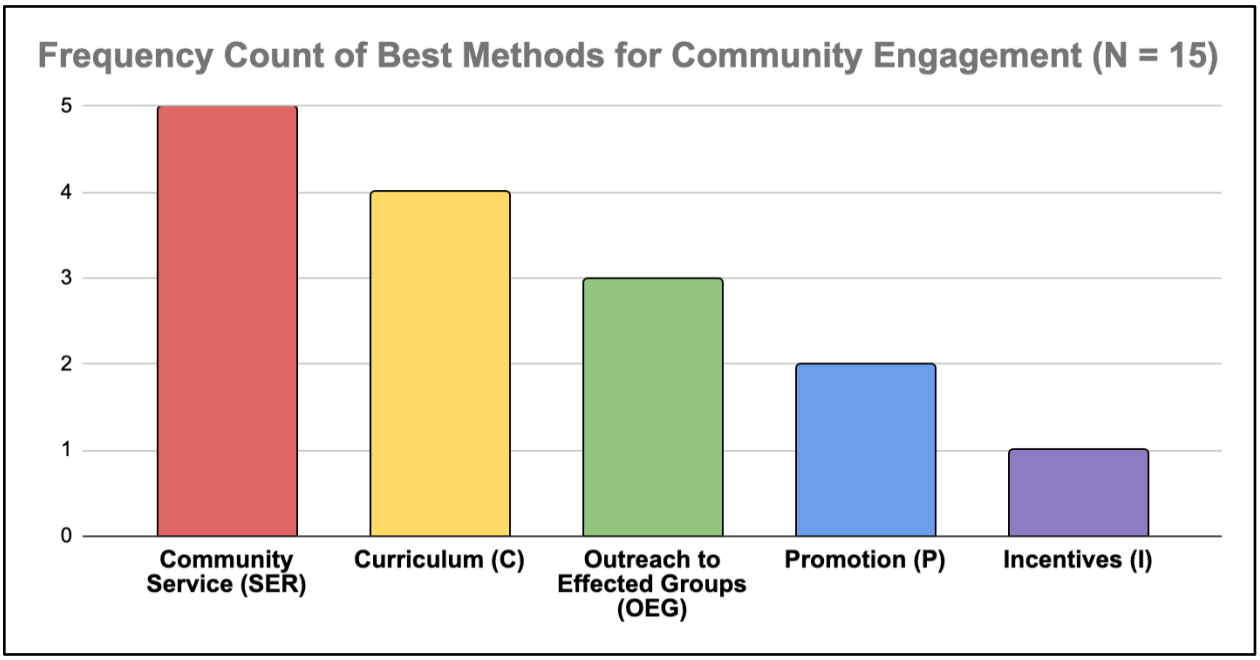


Looking at the transcripts, the team narrowed down eight common responses. The team tallied how many interviewees (out of the nine interviews) mentioned each response, thus producing a frequency count. The most common issue people recognize with respect to Cuenca's sidewalk accessibility is the inadequateness of the ramps. This could mean that the ramps are either too steep, not level with the crosswalk, or not wide enough for a wheelchair user. Two-thirds of the respondents recognized an issue with the ramps in Cuenca, meaning ramps are of high concern when addressing accessibility in Cuenca.

When the team asked all interviewees (except one expert in infrastructure) about how to engage the community to audit streets in Project Sidewalk, community service was the most common response. Figure 4.14 shows this frequency count.

Figure 4.14

Frequency Count of Best Methods for Community Engagement



From the nine experts and community members to whom the researchers asked this question, the most prevalent answer was to use community service to engage the community. The local universities could promote their students to audit streets because they have a requirement of 64 community service hours that they must complete in order to graduate. The next best response was to implement the application into the student's curriculum. The professors talked about how creating an assignment around Project Sidewalk could be beneficial to their urban development students or high school classes. The third best response

was reaching out to affected groups, which could include the elderly or those with disabilities. The lowest responses were promotion and incentives. Promotional methods include utilizing tools such as social media and going to public spaces to engage the community. Incentives refer to rewarding Project Sidewalk users to audit.

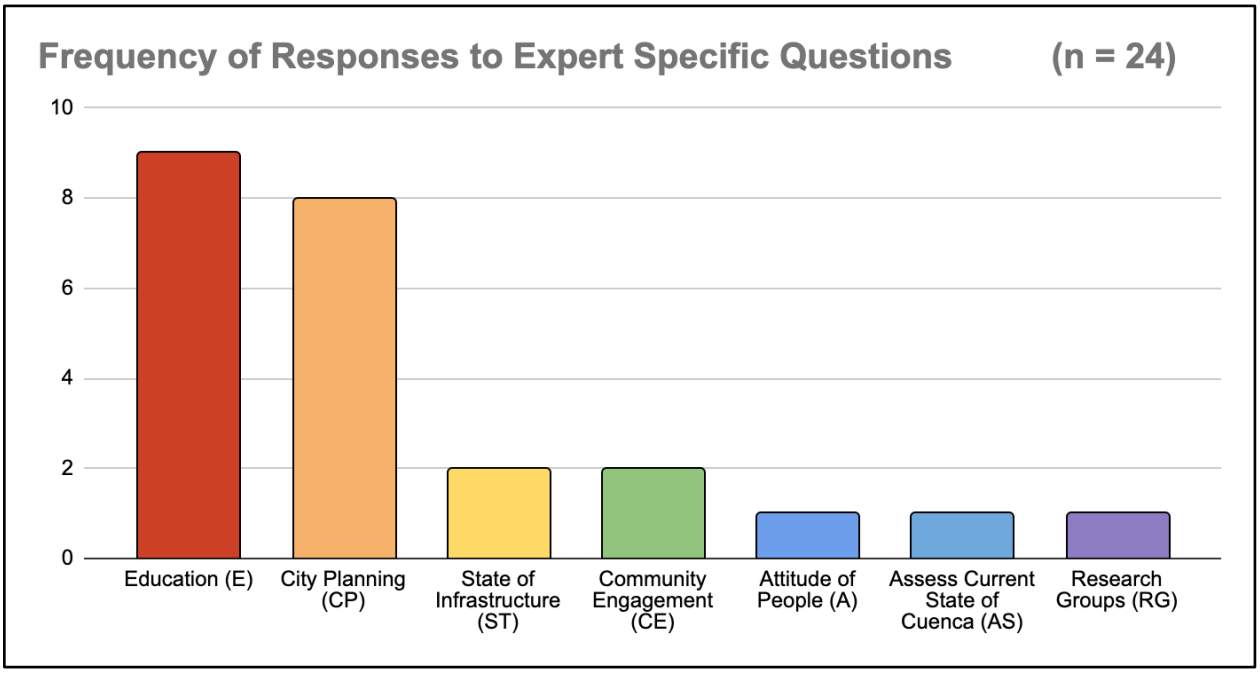
Lastly, when the team asked all interviewees (except the expert in engaging the community) if they would utilize Project Sidewalk to virtually review Cuenca's streets and identify inaccessible areas, the interviewees responded unanimously yes.

4.2.2. Experts

In the set of interviews with the experts, which were mainly professors and people with expertise on accessibility, the team asked questions regarding accessibility in Cuenca. The questions for these experts that the team asked specifically were "In what ways could the city improve its approach to accessibility?", "In your opinion, what is Cuenca's worst situation?", "What kind of resources are available and most important for addressing these challenges?", and "What do you think are the first necessary steps to make progress in addressing accessibility?". Given many different but recurring responses to these questions, the team coded and identified common aspects that each expert shared for these questions. Figure 4.15 represents the responses that were given by the five experts (professors or experts on accessibility) on all the questions regarding accessibility. It is important to note that some of the experts gave more than one answer to certain questions. The figure displays that the majority of our interviewees mentioned Education and City Planning the most often, with 9 responses and 8 responses respectively. The other aspects had one or two mentions, those being State of Infrastructure, Community Engagement, Attitude of People, Assess Current State of Cuenca, and Research Groups.

Figure 4.15

Frequency Count of Responses to Expert Specific Questions



Examining all the responses indicated that the most important aspect mentioned is education. Regarding education, the majority of the responses refer to the education of tactical workers or people that build and design the sidewalks. Many of the professors expressed that the worst problems regarding accessibility in Cuenca have to do with these designers and builders making the sidewalks and curb ramps but not considering how people with mobility impairments will use them. Figure 4.16 shows a quote describing this issue from the interview with Professor Daniel Orellana, who researched accessibility in Cuenca.

Figure 4.16

Quote from Professor Daniel Orellana

> "When they (the tactical workers) are trying to do something, like fulfilling the national norm on accessibility, they do it just because it's part of a checklist. Even in the new silos that they built last month, you can still find errors. There are pictures *[shows photos on his computer]*. The ramps that are there don't end at the same level of the street."

Many times, when the tactical workers construct curb ramps, they are just for show. This lack of attention to detail encourages the construction of ramps that are too steep, not level with the street, and too narrow, thus making it impossible for someone with mobility impairments to pass through with ease.

Another example of an answer regarding education was how educated the people of Cuenca are on the topic of accessibility. In an interview with Israel Idrovo, who completed research on accessibility, the researchers asked him what he felt is a necessary step to address accessibility in Cuenca. He stated, “Creo que hay que hacer campañas de educación para entender la discapacidad de manera crítica profunda y para entender el valor de la accesibilidad.” Israel feels that educating people on the experiences of those with mobility impairments when traversing through the sidewalks is necessary to understand the value of accessibility. Many people in Cuenca use cars as a main mode of transportation; therefore, they are not aware of the severity of the accessibility challenges in Cuenca.

The second highest response the interviewees mentioned is city planning. The city planners are disconnected with users of their sidewalks, justifying that they shouldn’t focus efforts on sidewalks because there are rarely any people with disabilities roaming through the streets. This is counter intuitive because the reason that there are few people with disabilities out on the streets is because the streets aren’t maintained and, therefore, almost impossible to travel through without help.

One of the more prevalent aspects of city planning the interviewees mentioned is the municipality and the politics involved in making change happen in Cuenca. Carla Hermida, a professor that used to work in the municipality, expressed that city planning is complicated because of how easily the municipality discontinues projects due to changing mayors, “The municipality, the mayor, and all his team will leave in May. So, everything that Guilherme has done will not be continued. And this is an example, but all the people that are working will not be continued. So, if there was something going on for accessibility, it'll not be continued.” She mentioned how seven years ago there was a project to improve the roads going to the tram downtown for walking; however, this never came to fruition because the newly elected mayor discontinued the project.

Guilherme Chalhoub, the expert in the infrastructure pipeline and who works in EMOV EP, gave the team more insight in the process of how an infrastructure change goes from idea to action in Cuenca. There are many stakeholders involved in any bill/law/project that goes through the Commission of Mobility. First, the Commission presents the law to the stakeholders involved. Next, the government of Cuenca publishes the law and sends it to the council where the 15 council members dispute it. Then, the technical team (EMOV EP, and other actors involved) discusses the law. They might make improvements or changes to said law and send it back to the council for a second debate. The entire process can take up to a year or even more,

which is part of the reason why municipalities discontinue big projects, as they can take too long for them to implement.

Several professors expressed that the government needs to create new laws and better enforce current laws to ensure that the city keeps the sidewalks up to accessibility standards. The professors believe that in terms of city planning, the government should revamp their investments of funds to improve the streets for pedestrians. Israel Idrovo stated that "Latinoamérica y creo en el mundo se invierte mucho más en, digamos en hay más inversión en dar facilidades al auto que el peatón que caminan. Se invierte mucho en carreteras, en parqueaderos en dar facilidad al auto y poco en dar facilidad al ciclista, al peatón." He says that the city invests too much money into highways and roads for motor vehicles, but the city neglects investing in the sidewalks for pedestrians and cyclists. Carla Hermida expressed that "We have invested a lot of money in when cars go down the highways over bridges. This year we had like one big one and I always say that we invest too much in motorized mobility. So if we could take 10% of that money and improve sidewalks that could go a long way, but politically it is not easy." If the city focused efforts on improving the street, it could greatly benefit the city's accessibility.

Finally, the interview with the creator of Project Sidewalk, Jon Froelich, informed the team on how the data from Project Sidewalk can help the municipality and city planners. In Newburg, Oregon, the data led to new policy changes and sidewalk repairs because the public utility office they worked with was able to see and understand the overall issue with accessibility in their city. In Oradell, New Jersey, Project Sidewalk helps to educate the community and present data to the city council. With these examples, the team sees the potential for EMOV EP to use the data in a similar manner to improve the street-level accessibility in the city.

4.2.3. Community Members

Community members, in the context of our project, are the elderly population in Cuenca and those with disabilities. These two specific groups make up the population that would struggle the most with inaccessible infrastructure. While coding the transcribed interviews and reviewing meeting minutes, the team identified a few important themes based on the participants' responses. The three themes that both interviewees touched upon were the difficulties of traveling in Cuenca and that they would utilize Project Sidewalk and promote the software to family and friends.

One question the team asked was "how frequently do you travel through Cuenca as a pedestrian?" Two participants, Juan Carlos Freire who uses a wheelchair and another, Marce

Gutierrez, who pushes her son in a wheelchair, reported that they only travel around the city as a pedestrian once per week. Both interviewees expressed that their preference for driving correlates with Cuenca's inaccessible sidewalks. Throughout their interviews, they described some of their personal struggles with the negative sidewalk conditions. Juan said that "Here the sidewalks are so high and if such an edge comes, it is difficult". To contextualize the quote, Juan was comparing Cuenca's sidewalks to some in New York city. From his personal experience, the curb ramps there are flat enough for wheelchair users to get over and traverse independently. Many of the sidewalks in Cuenca are not level with the road, which makes it difficult for wheelchair users to get onto a sidewalk. The team was able to support this claim from personal experience after completing a simulation with the Accion Social Municipal; a municipality that works with people with disabilities. The simulation consisted of the team walking blindfolded from the office of Accion Social Municipal to El Centro, then traversing in wheelchairs for 20 minutes. From this experience, the team observed that even the slightest difference in height between the curb ramp and the street can be very difficult to overcome independently.

In addition, the group asked the participants "if you would utilize Project Sidewalk and promote the software to others." After the team explained how the software worked and how it can be used, both participants expressed that they would utilize the software. They also believe that others in the community would also want to do the same and that they would promote it to family and friends. Furthermore, Marce said that she and her son would utilize the software and believes that the data from Project Sidewalk can educate community members. From their experience, there is an overall lack of awareness among those without any kind of impairments, but specifically car drivers. She states that, "They drive as if the cars have the right of way before pedestrians." The responses from the interviewees explained the difficulties of traveling through Cuenca and suggested that those with disabilities would use Project Sidewalk.

4.3. Test "Mapathon" Results

The team used the "mapathon" on April 24th as a trial run to learn how Project Sidewalk affects the user's accessibility awareness and receive feedback on how to improve running a mapathon for the next one in May, which would have over 75 students auditing. Before the event, users archived 1.5 miles of coverage with 346 labels and 120 validations in Cuenca. After auditing streets for 65 minutes, 18 users achieved 8.7 miles of coverage with 1,700 labels and 1,246 validations. The students that validated helped make sure the labels put in place are accurate, to make the data more effective. After the mapathon, the team talked to two students

to learn about their experience with using Project Sidewalk and receive feedback on the format of the mapathon. Both interviewees stated that they became more aware of the accessibility challenges in Cuenca after auditing the streets. For additional feedback, one student explained how they were getting lost trying to find their way around a street and how they saw some of the labels that they had already completed. With this feedback and responses, the team concluded that the event was successful based on how much auditing progress the students made. The team also learned about improvements they can make when teaching the software for the next mapping event. By establishing a strong relationship with professors in the urban development department, the team anticipates that the University of Azuay will continue to utilize the software in the curriculum to continue collecting data.

4.4. Summary

This chapter described the data the team collected regarding the implementation of Project Sidewalk in Cuenca and how to engage the community to utilize Project Sidewalk. The team's modified pilot of Project Sidewalk helped complete the first and second objectives. Through their observations, team members gained a better understanding of Cuenca's accessibility challenges. This observational data provides initial areas where EMOV can focus their efforts for sidewalk improvement. The data also highlights a few streets and neighborhoods that are very accessible, which policymakers can use as examples for future initiatives. Going forward, with the widespread use of Project Sidewalk, EMOV and other policymakers can obtain accessibility data for the entire city. Then, by comparing reality to GSV, the team determined that Project Sidewalk is a relevant and effective way to gather accessibility data in Cuenca. Through their interviews, the team gained further insight about accessibility challenges and ways to engage the community with Project Sidewalk. These interviews led to a successful Project Sidewalk mapathon at a local University. Overall, these results informed the team's final recommendations to their sponsor, EMOV EP, regarding infrastructure improvement and the continued use of Project Sidewalk.

5.0 Recommendations

This chapter provides recommendations for each of the six neighborhoods that the team walked and observed, and presented these plans to EMOV EP. In addition, the mapathon experience yielded recommendations for how future Cuenca Project Sidewalk mapathons should operate.

5.1. Neighborhood Recommendations

This section discusses the recommendations from the Cuenca neighborhoods that the team observed during their field audits. The recommendations suggest how EMOV EP can either improve these areas or use them as examples for future infrastructure changes.

5.1.1. Infrastructure Improvement Recommendations

One of the least walkable neighborhoods that the team visited was the University of Azuay. As seen in Figure 4.10, the University of Azuay neighborhood contained the highest number of negative labels per kilometer out of all the neighborhoods that the team traversed. The most significant challenge that the team observed in this area was the large abundance of sidewalk surface problems. The surface problems in this area are not few and far between; they are due to a general lack of maintenance of the sidewalks. Therefore, the city of Cuenca should repave the sidewalks in this neighborhood. The first street the city should address is Los Cisnes, where the team found 20 surface problems in just 350 meters of observation.

Additionally, the observations illustrate clearly that garage entrances cause surface problems. Unlike the United States, many garage entrances and driveways interfere with the pedestrian sidewalk. Figure 5.1 depicts a garage entrance in the University of Azuay neighborhood. The team recommends that the city should create and enforce new laws that prohibit garage entrances from blocking sidewalks, as these structures make it very difficult for someone with mobility impairments navigate.

Figure 5.1

Garage Entrance Surface Problem in the University of Azuay Neighborhood

The results also revealed an overarching lack of pedestrian signals and crosswalks. These intersection aspects are important for pedestrian safety and create a set of rules for both drivers and pedestrians to simultaneously follow. The lack of these labels produces a safety hazard for pedestrians, especially those who are not fully mobile.

Although the team observed curb ramps in every neighborhood they visited, many of them are unusable due to the level of the curb ramp being at a higher height than the street. Through both personal experience and interviews with community members, the team learned that such curb ramps are unusable in most cases, even with assistance. The city planners and tactical workers need to change the process of how curb ramps are made. To make this change happen, the team recommends to EMOV EP that they create a policy to ensure that every new curb ramp is level with the street. Figure 5.2 is a photo of a curb ramp in the Luis Cordero neighborhood, which is an example of a ramp that is not level with the street. There is also evidence of a disconnect between the tactical workers and people with mobility impairments. The city needs to address this disconnect and educate their workers on how to correctly design a sidewalk or curb ramp for accessibility as these workers are not designing infrastructure with their target audience in mind.

Figure 5.2

Curb Ramp in Luis Cordero Neighborhood

5.1.2. Successful Infrastructure Modeling Practices

In addition to aspects of Cuenca's infrastructure that need improvement, the team also noted positive characteristics that EMOV EP can use as models for future construction. Parque Calderón was the neighborhood with the least negative labels per kilometer. In this neighborhood, the team observed a consistent number of pedestrian signals. Four of the five streets had crosswalks, and curb ramps were the most common label that the team identified.

In the Calle Larga y Benigno Malo Neighborhood, most of the curb ramps were level with the street. Figure 5.3 shows a curb ramp that serves as a meaningful example for future improvements. Not only is this ramp level with the street, but it is wide enough to accommodate multiple people traversing side-by-side. The angle of inclination is also very gradual which prevents physical strain on individuals using the ramp. The Calle Larga y Benigno Malo neighborhood contains many of these curb ramps, so this would be a beneficial location for experts and policymakers to visit and to understand best practices.

Figure 5.3

Curb Ramp in the Calle Larga y Benigno Malo Neighborhood

In the area of the city known as “El Centro” which contains Parque Calderón and Calle Larga y Benigno Malo, the team noticed more consistency with the levelness of the sidewalks. These sidewalks appear to be newer and made from a different material than the sidewalks in the other observed neighborhoods. Figure 5.4 illustrates the material of the majority of the sidewalks in El Centro. Since this material is tile-based rather than concrete, it is more durable and can handle the large number of people that walk on it every day. The team recommends that experts model future sidewalks after the “El Centro” streets, since these sidewalks cause less surface problems than the ones in other neighborhoods.

Figure 5.4

Sidewalk in the Calle Larga y Benigno Malo Neighborhood

5.2. Continued Use of Project Sidewalk in Cuenca

Through their modified pilot test of Project Sidewalk, team members identified areas in Cuenca that need significant infrastructure improvements and areas that are relatively accessible for those with mobility impairments. However, the team only observed six neighborhoods, covering roughly 7.3 km of streets, which does not provide a full picture of the city. Continuing to use Project Sidewalk in Cuenca would allow community members to map all of Cuenca's sidewalks from the comfort of their own homes. This may point to additional areas in the city that need significant attention. EMOV could present comprehensive accessibility data to their connections in the Municipality of Cuenca (who is ultimately in charge of implementing sidewalk changes). If there are lingering concerns about the representativeness of Google Street View, EMOV could conduct further in-person observations and compare their results to GSV, further validating the software.

Additionally, in their interviews with infrastructure experts, the team learned that people in Cuenca lack awareness about street-level inaccessibility. Project Sidewalk could help to educate individuals who previously ignored this issue. After the test mapathon, both students interviewed reported feeling more aware of inaccessible infrastructure after auditing on Project Sidewalk. Going forward, Professors Carassco and Hermida at the University of Azuay will make auditing on Project Sidewalk an assignment in their Urban Studies classes. Students will

virtually audit up to four hours per semester until the mapping is complete. The team appreciates their continuing efforts and looks forward to seeing the progress they make.

Finally, the team has recommendations for EMOV or the University of Azuay if they plan to host additional mapathons in the future. After the test mapathon, the team learned that it is important to have a clear plan, translate Project Sidewalk's "Do's and Don'ts" Slideshow into Spanish, and remain available for any questions or comments. On May 4th or 5th, one or two team members will virtually join a larger-scale mapathon at the University of Azuay– with about 75 students. This will operate similarly to the test mapathon; however, the team created a YouTube video explaining Project Sidewalk. The professors will play this video in place of the team's in-person explanation. In addition, the video will include answers to the common questions students asked during the test mapathon. Students might feel more engaged in the mapping process if they are competing with one another. In any future mapathons, those in charge should inform participants about who is on the "leaderboard," which lists the participants who did the most auditing with the most accuracy. The team suspects this may further increase levels of engagement, thus leading to higher levels of accurate data collection.

6.0 Conclusion

During their time in Cuenca, team members identified streets and neighborhoods that need significant infrastructure improvements. Additionally, they realized that Cuenca's general population lacks knowledge of street-level accessibility issues in the city. Project Sidewalk is a low-cost solution that helps to identify inaccessible streets and neighborhoods for those with mobility impairments. By auditing streets on Project Sidewalk, community members can familiarize themselves with Cuenca's accessibility issues. Furthermore, the data collected through Project Sidewalk can inform and motivate policymakers and other stakeholders who have the ability to improve Cuenca's infrastructure. With future improvements, individuals with disabilities and otherwise impaired mobility will be able to travel through their city safely and easily.

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Appendix A Professor Interviews

Cuenca Expert Interviews

Appendix A is the interview protocol for speaking with infrastructure experts in Cuenca. The protocol includes an introduction to the team and project, a confidentiality statement, and the list of questions that will be asked during the interview.

Hello, we are a group of college students from Worcester Polytechnic Institute in MA, USA working with EMOV EP, or Cuenca's Public Office of Mobility, Transit, and Transport, to assist in their efforts to increase street-level accessibility in Cuenca by implementing Project Sidewalk and determining methods to engage the community. Project Sidewalk is a platform that allows users to virtually audit streets through Google Street View. Users virtually travel along streets in a city to label accessible/inaccessible aspects of the street in order to create a visual representation of inaccessible areas of a city. The effectiveness of this software relies on the ability of the community to engage and audit the streets. We would like to ask you a series of interview questions regarding constraints with implementing Project Sidewalk in Cuenca and methods to engage the community.

The interview will take approximately 60 minutes, but time may vary depending on the flow of conversation. There are no anticipated risks to you and no direct benefits to you for participating in this interview. Your responses will help us better understand how we can best involve the community in the completion of this project.

The interview will be audio-recorded, but you have the right to decline the recording. Your name and job title may be associated with your responses in our project report, but you also have the option to remain anonymous. Your participation in this interview is completely voluntary, and you have the right not to respond to any interview question. You should inform the interviewer if you would like to end the conversation at any time.

The goal of this interview is to gain expert insight about implementing Project Sidewalk and methods to engage the community to audit streets in this software.

1. **How long have you lived in Cuenca?**
2. **What is your job title and/or experience with infrastructure and/or accessibility?**
3. **In what ways could the city improve its approach to accessibility?**
4. **In your opinion, what is Cuenca's worst situation with respect to accessibility?**

5. **What kind of resources are available and most important for addressing these challenges?**
6. **What do you think are the first necessary steps to make progress in addressing accessibility?**
7. **Would you be willing to utilize Project Sidewalk to virtually review Cuenca's streets and identify inaccessible areas?**
8. **Do you think other members of the community would be willing to participate in auditing using Project Sidewalk?**
9. **In your opinion, how can we engage the community to participate in auditing streets through Project Sidewalk?**
    a. **In the past, other cities have hosted mapathons or offered community service credit for participating. Do these seem like effective methods of community engagement?**
10. **Do you have any ideas to get students at the university to help map out Cuenca in Project Sidewalk?**
    a. **In other cities, professors created an assignment for their students to audit a certain number of streets. Is this something you could see yourself doing?**
    b. **Could auditing streets help fulfill community service requirements? If so, can you tell us more about these requirements?**
11. **In Project Sidewalk, there are currently seven categories of sidewalk obstacles, including missing curb ramps and surface problems, among others. We are considering adding another category for Cuenca: garage entrances.**
    a. **Do you think this would be a beneficial addition?**
12. **Do you know anyone we can talk to get more insight about this topic?**

Spanish Translation

Hola, somos un grupo de estudiantes universitarios del Instituto Politécnico de Worcester en MA, EE.UU. Estamos trabajando con EMOV EP, o la Oficina Pública de Movilidad, Tránsito y Transporte de Cuenca, para ayudar en sus esfuerzos para mejorar la accesibilidad a nivel de calle en Cuenca mediante la implementación del Proyecto Acera (Project Sidewalk) y la determinación de métodos para involucrar a la comunidad. Project Sidewalk es una plataforma que permite a los usuarios auditar virtualmente las calles a través

de Google Street View. Los usuarios viajan virtualmente a lo largo de las calles de una ciudad para identificar los aspectos accesibles / inaccesibles de la calle con el fin de crear una representación visual de las áreas inaccesibles de una ciudad. La eficacia de este software depende de la capacidad de la comunidad para participar y auditar las calles. Nos gustaría hacerle una serie de preguntas de entrevista sobre las limitaciones con la implementación del Proyecto Sidewalk en Cuenca y los métodos para involucrar a la comunidad.

La entrevista durará aproximadamente 60 minutos, pero el tiempo puede variar dependiendo del flujo de conversación. No hay riesgos anticipados para usted ni beneficios directos para usted por participar en esta entrevista. Sus respuestas nos ayudarán a entender mejor cómo podemos involucrar mejor a la comunidad en la finalización de este proyecto. Esta entrevista será grabada en audio, pero usted tiene el derecho de rechazar la grabación. Su nombre no se asociará con sus respuestas en nuestro informe del proyecto. Su participación en esta entrevista es completamente voluntaria. Usted tiene el derecho de no responder a ninguna pregunta de la entrevista y debe informar al entrevistador si desea terminar la conversación en cualquier momento.

Estamos buscando obtener comentarios sobre Project Sidewalk y si los miembros de la comunidad piensan que es una solución factible y de bajo costo para abordar los desafíos de accesibilidad de Cuenca. Además, estamos interesados en conocer las opiniones de las personas sobre métodos efectivos de participación comunitaria, ya que esto es necesario al implementar Project Sidewalk.

1. **¿Cuánto hace que vive en Cuenca?**
2. **¿Cuál es su título de trabajo y / o experiencia con infraestructura y / o accesibilidad?**
3. **¿De qué manera podría la ciudad mejorar su enfoque de la accesibilidad?**
4. **En su opinión, ¿cuál es la peor situación de Cuenca en materia de accesibilidad?**
5. **¿Qué tipo de recursos están disponibles y son más importantes para abordar estos desafíos?**
6. **¿Cuáles cree que son los primeros pasos necesarios para avanzar en el abordaje de la accesibilidad?**
7. **¿Estaría dispuesto a utilizar Project Sidewalk para revisar virtualmente las calles de Cuenca e identificar áreas inaccesibles?**
8. **Do you think other members of the community would be willing to participate in auditing using Project Sidewalk?**

9. **En su opinión, ¿cómo podemos involucrar a la comunidad para que participe en la auditoría de calles a través del Project Sidewalk?**
    a. **En el pasado, otras ciudades han organizado mapatones u ofrecido crédito de servicio comunitario por participar. ¿Parecen estos métodos efectivos de participación comunitaria?**
10. **¿Tiene alguna idea para que los estudiantes de la universidad ayuden a trazar el mapa de Cuenca en Project Sidewalk?**
    a. **En otras ciudades, los profesores crearon una tarea para que sus estudiantes auditen un cierto número de calles. ¿Es esto algo que podrías verte haciendo?**
    b. **¿Podría la auditoría de calles ayudar a cumplir con los requisitos de servicio comunitario? Si es así, ¿puede decirnos más sobre estos requisitos?**
11. **En Project Sidewalk, actualmente hay siete categorías de obstáculos en las aceras, incluyendo rampas de bordillo faltantes y problemas de superficie, entre otros. Estamos considerando agregar otra categoría para Cuenca: Entradas a garajes.**
    a. **¿Cree que esto sería una buena adición?**
12. **¿Conoces a alguien con quien podamos hablar para obtener más información sobre este tema?**

Appendix B Guilherme Chalhoub Interview

Sponsor Interview

Appendix B is the interview protocol for speaking with the team's sponsor from EMOV EP, Guilherme Chalhoub.

Some ways that other cities have engaged the community to help audit streets is by hosting "Mapathons" or collaborating with local universities to create an assignment for students to complete. It is important to note that using Project Sidewalk can all be done through your computer and anyone anywhere can audit streets.

We would like to ask you a series of interview questions regarding methods to engage the community. The interview will take approximately 30 minutes, but time may vary depending on the flow of conversation. There are no anticipated risks to you and no direct benefits to you for participating in this interview. Your responses will help us better understand how we can best involve the community in the completion of this project.

The interview will be audio-recorded, but you have the right to decline the recording. Your name and job title may be associated with your responses in our project report, but you also have the option to remain anonymous. Your participation in this interview is completely voluntary, and you have the right not to respond to any interview question. You should inform the interviewer if you would like to end the conversation at any time.

The goal of this interview is to gain expert insight about community engagement. Specifically, we would like feedback about getting the different communities in Cuenca involved with auditing streets in Project Sidewalk.

1. **How long have you lived in Cuenca or the surrounding areas?**
2. **What is your main mode of transportation in Cuenca?**
3. **What have you noticed about pedestrians and sidewalks while biking?**
4. **Who makes the changes in the sidewalk? Who is responsible?**
5. **How does an infrastructure change go from an idea to being implemented? (i.e., what is the pipeline)**
6. **How will EMOV use the data collected through Project Sidewalk?**
7. **When we leave Cuenca, how can EMOV continue utilizing Project Sidewalk?**
8. **How can EMOV promote this project?**
9. **What do you want the team (us) to leave behind with this project?**

Appendix C Community Member Interviews

Cuenca Community Member Interviews

Appendix C is the interview protocol for speaking with community members in Cuenca. The protocol includes an introduction to the team and project, a confidentiality statement, and the list of questions that will be asked during the interview.

Hello, we are a group of college students from Worcester Polytechnic Institute in MA, USA working with EMOV EP, or Cuenca's Public Office of Mobility, Transit, and Transport, to assist in their efforts to increase street-level accessibility in Cuenca by implementing Project Sidewalk and determining methods to engage the community. Project Sidewalk is a platform that allows users to virtually audit streets through Google Street View. Users virtually travel along streets in a city to label accessible/inaccessible aspects of the street in order to create a visual representation of inaccessible areas of a city. The effectiveness of this software relies on the ability of the community to engage and audit the streets. We would like to ask you a series of interview questions regarding constraints with implementing Project Sidewalk in Cuenca and methods to engage the community.

The interview will take approximately 60 minutes, but time may vary depending on the flow of conversation. There are no anticipated risks to you and no direct benefits to you for participating in this interview. Your responses will help us better understand how we can best involve the community in the completion of this project. This interview will be audio-recorded, but you have the right to decline the recording. Your name will not be associated with your responses in our project report. Your participation in this interview is completely voluntary. You have the right not to respond to any interview question and should inform the interviewer if you would like to end the conversation at any time.

The goal of this interview is to speak with individuals with a range of mobility statuses and to hear if these community members have had personal encounters with Cuenca's infrastructure that led to inconvenience or injury. We are also looking to gain feedback about Project Sidewalk and whether community members think it is a feasible, low-cost solution for addressing Cuenca's accessibility challenges. Furthermore, we are interested in learning individuals' opinions about effective methods of community engagement, as this is necessary when implementing Project Sidewalk.

1. **How long have you lived in Cuenca?**
2. **How do you typically get around Cuenca?**
3. **How often do you travel Cuenca's streets as a pedestrian (i.e., not in a car, bus, bike, etc.)?**
4. **Have you ever had problems with sidewalk evenness, holes in the sidewalk, obstructions, or the width of the sidewalks? Can you give us an example of what happened?**
    a. **Do you know someone else who has experienced similar challenges?**
5. **Has a lack of auditory cues near intersections ever impaired your ability to move safely?**
    a. **If individual is vision impaired, ask about truncated domes**
6. **At traffic lights, do you feel you have enough time to cross the street safely? Do you wish the pedestrian light lasted longer?**
7. **Would you be willing to utilize Project Sidewalk to virtually review Cuenca's streets and identify inaccessible areas?**
8. **Do you think other members of the community would be willing to participate in auditing using Project Sidewalk?**
9. **In your opinion, how can we engage the community to participate in auditing streets through Project Sidewalk?**
    a. **In the past, other cities have hosted mapathons or offered community service credit for participating. Do these seem like effective methods of community engagement?**
10. **In Project Sidewalk, there are currently seven categories of sidewalk obstacles, including missing curb ramps and surface problems, among others. We are considering adding another category for Cuenca: garage entrances.**
    a. **Do you think this would be a beneficial addition?**

Spanish Translation

Hola, somos un grupo de estudiantes universitarios del Instituto Politécnico de Worcester en MA, EE.UU. Estamos trabajando con EMOV EP, o la Oficina Pública de Movilidad, Tránsito y Transporte de Cuenca, para ayudar en sus esfuerzos para mejorar la accesibilidad a nivel de calle en Cuenca mediante la implementación del Proyecto Acera (Project Sidewalk) y la determinación de métodos para involucrar a la comunidad. Project

Sidewalk es una plataforma que permite a los usuarios auditar virtualmente las calles a través de Google Street View. Los usuarios viajan virtualmente a lo largo de las calles de una ciudad para identificar los aspectos accesibles / inaccesibles de la calle con el fin de crear una representación visual de las áreas inaccesibles de una ciudad. La eficacia de este software depende de la capacidad de la comunidad para participar y auditar las calles. Nos gustaría hacerle una serie de preguntas de entrevista sobre las limitaciones con la implementación del Proyecto Sidewalk en Cuenca y los métodos para involucrar a la comunidad.

La entrevista durará aproximadamente 60 minutos, pero el tiempo puede variar dependiendo del flujo de conversación. No hay riesgos anticipados para usted ni beneficios directos para usted por participar en esta entrevista. Sus respuestas nos ayudarán a entender mejor cómo podemos involucrar mejor a la comunidad en la finalización de este proyecto. Esta entrevista será grabada en audio, pero usted tiene el derecho de rechazar la grabación. Su nombre no se asociará con sus respuestas en nuestro informe del proyecto. Su participación en esta entrevista es completamente voluntaria. Usted tiene el derecho de no responder a ninguna pregunta de la entrevista y debe informar al entrevistador si desea terminar la conversación en cualquier momento.

El objetivo de esta entrevista es hablar con personas con una variedad de estados de movilidad y escuchar si estos miembros de la comunidad han tenido encuentros personales con la infraestructura de Cuenca que llevaron a inconvenientes o lesiones. También estamos buscando obtener comentarios sobre Project Sidewalk y si los miembros de la comunidad piensan que es una solución factible y de bajo costo para abordar los desafíos de accesibilidad de Cuenca. Además, estamos interesados en conocer las opiniones de las personas sobre métodos efectivos de participación comunitaria, ya que esto es necesario al implementar Project Sidewalk.

1. **¿Cuánto hace que vives en Cuenca?**
2. **¿Cómo te mueves normalmente por Cuenca?**
3. **¿Con qué frecuencia recorre las calles de Cuenca como peatón (es decir, no en automóvil, autobús, bicicleta, etc.)?**
4. **¿Alguna vez ha tenido problemas con la uniformidad de la acera, agujeros en la acera, obstrucciones o el ancho de las aceras? ¿Puede darnos un ejemplo de lo que sucedió?**
    a. **¿Conoces a alguien más que haya experimentado desafíos similares?**

5. **¿La falta de señales auditivas cerca de las intersecciones ha afectado alguna vez su capacidad para moverse con seguridad?**
    a. **Si la persona tiene discapacidad visual, preguntar sobre los domos táctiles**
6. **En los semáforos, ¿siente que tiene suficiente tiempo para cruzar la calle de manera segura? ¿Desearía que el semáforo para peatones durará más?**
7. **¿Estaría dispuesto a utilizar Project Sidewalk para revisar virtualmente las calles de Cuenca e identificar áreas inaccesibles?**
8. **¿Crees que otros miembros de la comunidad estarían dispuestos a participar en la auditoría usando Project Sidewalk?**
9. **¿Estaría dispuesto a utilizar Project Sidewalk para revisar virtualmente las calles de Cuenca e identificar áreas inaccesibles?**
10. **En Project Sidewalk, actualmente hay siete categorías de obstáculos en las aceras, incluyendo rampas de bordillo faltantes y problemas de superficie, entre otros. Estamos considerando agregar otra categoría para Cuenca: Entradas a garajes.**
    a. **¿Cree que esto sería una buena adición?**

Appendix D Creator of Project Sidewalk Interview

Creator of Project Sidewalk Interview

Appendix D is the interview protocol for speaking with the creator of Project Sidewalk. The protocol includes an introduction to the team and project, a confidentiality statement, and the list of questions that will be asked during the interview.

Hello, we are a group of college students from Worcester Polytechnic Institute in MA, USA working with EMOV EP, or Public Office of Mobility, Transit, and Transport of the Municipality of Cuenca, to assist in their efforts to increase street-level accessibility in Cuenca by implementing Project Sidewalk and determining methods to engage the community. We would like to ask you a series of interview questions regarding the feasibility to implement Project Sidewalk in Cuenca. The interview will take approximately 60 minutes, but time may vary depending on the flow of conversation. There are no anticipated risks to you and no direct benefits to you for participating in this interview. Your responses will help us better understand how we can best involve the community in the completion of this project.

The interview will be audio-recorded, but you have the right to decline the recording. Your name and job title may be associated with your responses in our project report, but you also have the option to remain anonymous. Your participation in this interview is completely voluntary, and you have the right not to respond to any interview question. You should inform the interviewer if you would like to end the conversation at any time.

The goal of this interview is to learn the feasibility of implementing Project Sidewalk and what you need from us in order to make its implementation successful.

1. **How does the application function from your side? Who's in charge and how many people work on it, etc.?**
2. **What data or resources do you need from us here in order to get the application implemented?**
3. **The team has discussed a few strategies for community engagement:**
    a. **Reaching out to churches and schools for community service hours**
    b. **Using social media and incentives - like a giveaway**
    c. **Host an event for the public describing our project goal**

    What feedback would you give on these ideas? Are there any other ideas that you think we should try?

4. **What are some ways you've seen Project Sidewalk funded in other cities?**
5. **Do you have an estimated timeline for how long it takes to audit/map-out particular areas?**
6. **Has data collected through project sidewalk been used to develop navigating tools for people with mobility impairments, or were there other ways the data was utilized to benefit a city?**
7. **If GSV for Cuenca is outdated (2015), would it be possible to use Mapillary instead? (There is already some data on Cuenca's accessibility stored by Mapilllary). Or could the two be used in conjunction with each other?**
8. **How does Project Sidewalk take into account major infrastructure differences from GSV?**
9. **How specifically does Project Sidewalk help municipalities or the community? Can you give us some examples?**

Appendix E Community Engagement Expert Interview

Cuenca Community Engagement Expert Interview

Appendix E is the interview protocol for speaking with community engagement experts in Cuenca. The protocol includes an introduction to the team and project, a confidentiality statement, and the list of questions that will be asked during the interview.

Hello, we are a group of college students from Worcester Polytechnic Institute in MA, USA working with EMOV EP, or Public Office of Mobility, Transit, and Transport of the Municipality of Cuenca, to assist in their efforts to increase street-level accessibility in Cuenca by implementing Project Sidewalk and determining methods to engage the community. Project Sidewalk is a website that allows users to virtually audit streets through Google Street View. Users virtually travel along streets in a city to label accessible/inaccessible aspects of the street in order to create a visual representation of inaccessible areas of a city. The effectiveness of this software relies on the ability for the community to engage and audit the streets. We would like to ask you a series of interview questions regarding methods to engage the community. The interview will take approximately 60 minutes, but time may vary depending on the flow of conversation. There are no anticipated risks to you and no direct benefits to you for participating in this interview. Your responses will help us better understand how we can best involve the community in the completion of this project.

The interview will be audio-recorded, but you have the right to decline the recording. Your name and job title may be associated with your responses in our project report, but you also have the option to remain anonymous. Your participation in this interview is completely voluntary, and you have the right not to respond to any interview question. You should inform the interviewer if you would like to end the conversation at any time.

The goal of this interview is to gain expert insight about community engagement. Specifically, we would like feedback about getting the community involved with auditing streets in Project Sidewalk.

1. **What is your job title and experience with community engagement?**
    a. **What organization do you work for?**
2. **How long have you lived in Cuenca or the surrounding areas?**
3. **What tactics have you used for community engagement either with people with disabilities or elderly people?**

    a. **If neither, then just in general**
    b. **Any recommendations for target populations and methods?**
4. **How were you able to get students from the University of Azuay involved and can this project, considering the 5 week time constraint, do something similar?**
5. **Do you have any recommendations for us to get people involved with this project?**
6. **Do you recommend we talk to any target populations to help us with this project?**
    a. **We are currently interested in the elderly and those with disabilities.**
7. **Is there anyone else you know that would be beneficial for us to interview?**

Spanish Translation

Hola, somos un grupo de estudiantes universitarios del Instituto Politécnico de Worcester en MA, USA que trabajan con EMOV EP, u Oficina Pública de Movilidad, Tránsito y Transporte del Municipio de Cuenca, para ayudarlos en sus esfuerzos por aumentar la accesibilidad a pie de calle en Cuenca implementando el Proyecto Vereda y determinando métodos para involucrar a la comunidad. Project Sidewalk es una plataforma que permite a los usuarios auditar virtualmente las calles a través de Google Street View. Los usuarios viajan virtualmente por las calles de una ciudad para etiquetar los aspectos accesibles/inaccesibles de la calle con el fin de crear una representación visual de las áreas inaccesibles de una ciudad. La eficacia de este software se basa en la capacidad de la comunidad para participar y auditar las calles.

Algunas formas en que otras ciudades han involucrado a la comunidad para ayudar a auditar las calles es organizando "Mapathons" o colaborando con universidades locales para crear una tarea para que la completen los estudiantes. Es importante tener en cuenta que el uso de Project Sidewalk se puede hacer a través de su computadora y cualquier persona en cualquier lugar puede auditar las calles.

Nos gustaría hacerle una serie de preguntas de la entrevista con respecto a los métodos para involucrar a la comunidad. La entrevista durará aproximadamente 30 minutos, pero el tiempo puede variar según el flujo de la conversación. No existen riesgos previstos para usted ni beneficios directos para usted por participar en esta entrevista. Sus respuestas nos ayudarán a comprender mejor cómo podemos involucrar mejor a la comunidad en la realización de este proyecto.

La entrevista se grabará en audio, pero tiene derecho a rechazar la grabación. Su nombre y puesto de trabajo pueden estar asociados con sus respuestas en nuestro informe de proyecto, pero también tiene la opción de permanecer en el anonimato. Su participación en

esta entrevista es completamente voluntaria y tiene derecho a no responder a ninguna pregunta de la entrevista. Debe informar al entrevistador si desea finalizar la conversación en cualquier momento.

El objetivo de esta entrevista es obtener información experta sobre la participación de la comunidad. Específicamente, nos gustaría recibir comentarios sobre cómo involucrar a las diferentes comunidades de Cuenca en la auditoría de calles en el Proyecto Acera.

1. **¿Cuál es su título laboral y su experiencia en participación comunitaria?**
    a. **¿Para qué organización trabajas?**
2. **¿Cuánto tiempo ha vivido en Cuenca o en las áreas circundantes?**
3. **¿Qué tácticas ha utilizado para la participación comunitaria, ya sea con personas con discapacidades o personas mayores?**
    a. **Si ninguno, entonces solo en general.**
    b. **¿Alguna recomendación para las poblaciones objetivo y los métodos?**
4. **¿Cómo logró involucrar a los estudiantes de la Universidad de Azuay en proyectos anteriores? ¿Podría un proyecto con una restricción de tiempo de 5 semanas hacer algo similar?**
5. **¿Tiene alguna recomendación para que podamos involucrar a las personas en este proyecto?**
6. **¿Recomienda que hablemos con algún grupo poblacional específico para que nos ayude con este proyecto?**
    a. **Actualmente nos interesan las personas mayores y las personas con discapacidad.**
7. **¿Conoce a alguien más que sería beneficioso para que lo entrevistamos en relación con este proyecto?**

Appendix F– Observation Worksheets by Neighborhood

University of Azuay Neighborhood

	Neighborhood: University of Azuay											
	Street Name	Las Garzas		Los Cisnes		Del Chirote		Los Canarios		Las Gaviotas		Total Distance
	Distance (m)	350		350		190		400		240		**1530**
	Strategy of Observation	GSV	In-Person	GSV	In-Person	GSV	In-Person	GSV	In-Person	GSV	In-Person	
Project Sidewalk Label	Curb Ramp	1	3	0	0	2	2	3	4	1	0	
	Missing Curb Ramp	3	2	6	6	4	6	10	10	5	4	
	Obstacle in Path	6	4	7	5	2	1	2	3	3	1	
	Surface Problem	4	6	20	20	9	10	32	39	19	18	
	No Sidewalk	0	0	0	0	0	0	4	0	0	0	
	Crosswalk	0	1	0	0	0	0	3	0	0	0	
	Pedestrian Signal	0	1	0	0	0	0	0	0	0	0	Total In-Person Labels
	Other	0	0	0	0	0	0	0	0	1	1	
	Total	**14**	**17**	**33**	**31**	**17**	**19**	**54**	**56**	**29**	**24**	**147**

	Neighborhood: University of Azuay					
	Differences	Las Garzas	Los Cisnes	Del Chirote	Los Canarios	Las Gaviotas	Total
Project Sidewalk Label	Curb Ramp	2	0	0	1	1	**4**
	Missing Curb Ramp	1	0	2	0	1	**4**
	Obstacle in Path	2	2	1	1	2	**8**
	Surface Problem	2	0	1	7	1	**11**
	No Sidewalk	0	0	0	4	0	**4**
	Crosswalk	1	0	0	3	0	**4**
	Pedestrian Signal	1	0	0	0	0	**1**
	Other	0	0	0	0	0	**0**
	Total Differences	**9**	**2**	**4**	**16**	**5**	**36**

Parque Calderón Neighborhood

	Neighborhood: Parque Calderón											
	Street Name	Benigno Malo		Gran Colombia		Hermano Miguel		Simón Bolivar		Mariscal Sucre		Total Distance
	Distance (m)	211		325		215		329		327		**1407**
	Strategy of Observation	GSV	In-Person	GSV	In-Person	GSV	In-Person	GSV	In-Person	327	In-Person	
Project Sidewalk Label	Curb Ramp	12	12	18	11	12	13	11	11	22	22	
	Missing Curb Ramp	0	0	0	0	1	0	0	0	0	0	
	Obstacle in Path	0	0	1	3	1	0	0	0	0	0	
	Surface Problem	0	0	6	10	3	3	0	0	2	3	
	No Sidewalk	0	0	0	0	0	0	0	0	0	0	
	Crosswalk	5	5	0	0	5	7	7	7	12	12	
	Pedestrian Signal	5	5	7	7	5	5	5	5	11	11	Total In-Person Labels
	Other	0	0	0	0	0	0	0	0	0	0	
	Total	**22**	**22**	**32**	**31**	**27**	**28**	**23**	**23**	**47**	**48**	**152**

	Neighborhood: Parque Calderón					
	Differences	Benigno Malo	Gran Colombia	Hermano Miguel	Simón Bolivar	Mariscal Sucre	Total
Project Sidewalk Label	Curb Ramp	0	7	1	0	0	**8**
	Missing Curb Ramp	0	0	1	0	0	**1**
	Obstacle in Path	0	2	1	0	1	**4**
	Surface Problem	0	4	0	0	0	**4**
	No Sidewalk	0	0	0	0	0	**0**
	Crosswalk	0	8	2	0	0	**10**
	Pedestrian Signal	0	0	0	0	0	**0**
	Other	0	0	0	0	0	**0**
	Total Differences	**0**	**21**	**5**	**0**	**1**	**27**

Ave. Solano Neighborhood

	Neighborhood: Ave. Solano										
	Street Name	Federcio Malo		Ave. 12 de Abril		Ave. Solano		José Alvear		Tadeo Torres	Total Distance
	Distance (m)	220		300		280		200		250	**1250**
	Strategy of Observation	GSV	In-Person	GSV	In-Person	GSV	In-Person	GSV	In-Person	327	In-Person	
Project Sidewalk Label	Curb Ramp	3	4	5	5	8	8	2	2	2	2	
	Missing Curb Ramp	3	2	0	0	0	0	2	2	8	8	
	Obstacle in Path	1	1	0	0	0	0	0	0	1	1	
	Surface Problem	12	11	1	0	0	0	12	14	15	13	
	No Sidewalk	0	0	0	0	0	0	0	0	0	0	
	Crosswalk	3	1	3	3	0	0	2	1	3	1	
	Pedestrian Signal	2	4	2	2	5	6	0	0	0	0	Total In-Person Labels
	Other	0	0	0	0	3	3	0	0	0	0	
	Total	**24**	**23**	**11**	**10**	**16**	**17**	**18**	**19**	**29**	**25**	**94**

	Neighborhood: Ave. Solano					
	Differences	Federcio Malo	Ave. 12 de Abril	Ave. Solano	José Alvear	Tadeo Torres	Total
Project Sidewalk Label	Curb Ramp	1	0	0	0	0	**1**
	Missing Curb Ramp	1	0	0	0	0	**1**
	Obstacle in Path	0	0	0	0	0	**0**
	Surface Problem	1	1	0	2	2	**6**
	No Sidewalk	0	0	0	0	0	**0**
	Crosswalk	2	0	0	0	2	**4**
	Pedestrian Signal	2	0	1	1	0	**4**
	Other	0	0	0	0	0	**0**
	Total Differences	**7**	**1**	**1**	**3**	**4**	**16**

Calle Larga y Benigno Malo Neighborhood

	Neighborhood: Calle Larga y Benigno Malo										
	Street Name	Juan Jaramillo		Padre Aguirre		Calle Larga		Benigno Malo		Presidente Cordova	Total Distance
	Distance (m)	110		110		120		250		220	**810**
	Strategy of Observation	GSV	In-Person	GSV	In-Person	GSV	In-Person	GSV	In-Person	327	In-Person	
Project Sidewalk Label	Curb Ramp	6	6	3	4	9	9	12	12	6	8	
	Missing Curb Ramp	2	2	4	2	0	0	0	0	6	0	
	Obstacle in Path	2	0	1	1	2	1	1	0	1	0	
	Surface Problem	0	0	8	11	1	0	0	2	2	2	
	No Sidewalk	0	0	0	0	0	0	0	0	0	0	
	Crosswalk	4	4	2	4	4	6	10	11	4	9	
	Pedestrian Signal	2	2	4	3	2	2	5	5	4	5	Total In-Person Labels
	Other	0	0	0	0	0	0	0	0	0	0	
	Total	**16**	**14**	**22**	**25**	**18**	**18**	**28**	**30**	**23**	**24**	**111**

	Neighborhood: Calle Larga y Benigno Malo						
	Differences	Juan Jaramillo	Padre Aguirre	Calle Larga	Benigno Malo	Presidente Cordova	Total
Project Sidewalk Label	Curb Ramp	0	1	0	0	2	**3**
	Missing Curb Ramp	0	2	0	0	6	**8**
	Obstacle in Path	2	0	1	1	1	**5**
	Surface Problem	0	3	1	2	0	**6**
	No Sidewalk	0	0	0	0	0	**0**
	Crosswalk	0	2	2	1	5	**10**
	Pedestrian Signal	0	1	0	0	1	**2**
	Other	0	0	0	0	0	**0**
	Total Differences	**2**	**9**	**4**	**4**	**15**	**34**

Quinta Chica Neighborhood

	Neighborhood: Quinta Chica										
	Street Name	San Pablo del Lago		La Toradora		Cuicocha		Yambo		Surochucho	Total Distance
	Distance (m)	550		240		350		150		200	**1490**
	Strategy of Observation	GSV	In-Person	GSV	In-Person	GSV	In-Person	GSV	In-Person	327	In-Person
Project Sidewalk Label	Curb Ramp	3	3	1	1	8	8	1	1	3	3
	Missing Curb Ramp	6	6	0	0	4	3	3	3	5	5
	Obstacle in Path	1	1	9	9	1	1	0	0	6	3
	Surface Problem	44	50	48	44	6	8	0	0	25	24
	No Sidewalk	0	0	0	0	6	6	4	4	0	0
	Crosswalk	2	2	0	0	0	0	0	0	1	1
	Pedestrian Signal	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
	Total	**56**	**62**	**58**	**54**	**25**	**26**	**8**	**8**	**40**	**36**

Total In-Person Labels: **186**

	Neighborhood: Quinta Chica					
	Differences	San Pablo del Lago	La Toradora	Cuicocha	Yambo	Surochucho	Total
Project Sidewalk Label	Curb Ramp	0	0	0	0	0	**0**
	Missing Curb Ramp	0	0	1	0	0	**1**
	Obstacle in Path	0	0	0	0	3	**3**
	Surface Problem	6	4	2	0	3	**15**
	No Sidewalk	0	0	0	0	1	**1**
	Crosswalk	0	0	0	0	0	**0**
	Pedestrian Signal	0	0	0	0	0	**0**
	Other	0	0	0	0	0	**0**
	Total Differences	**6**	**4**	**3**	**0**	**7**	**20**

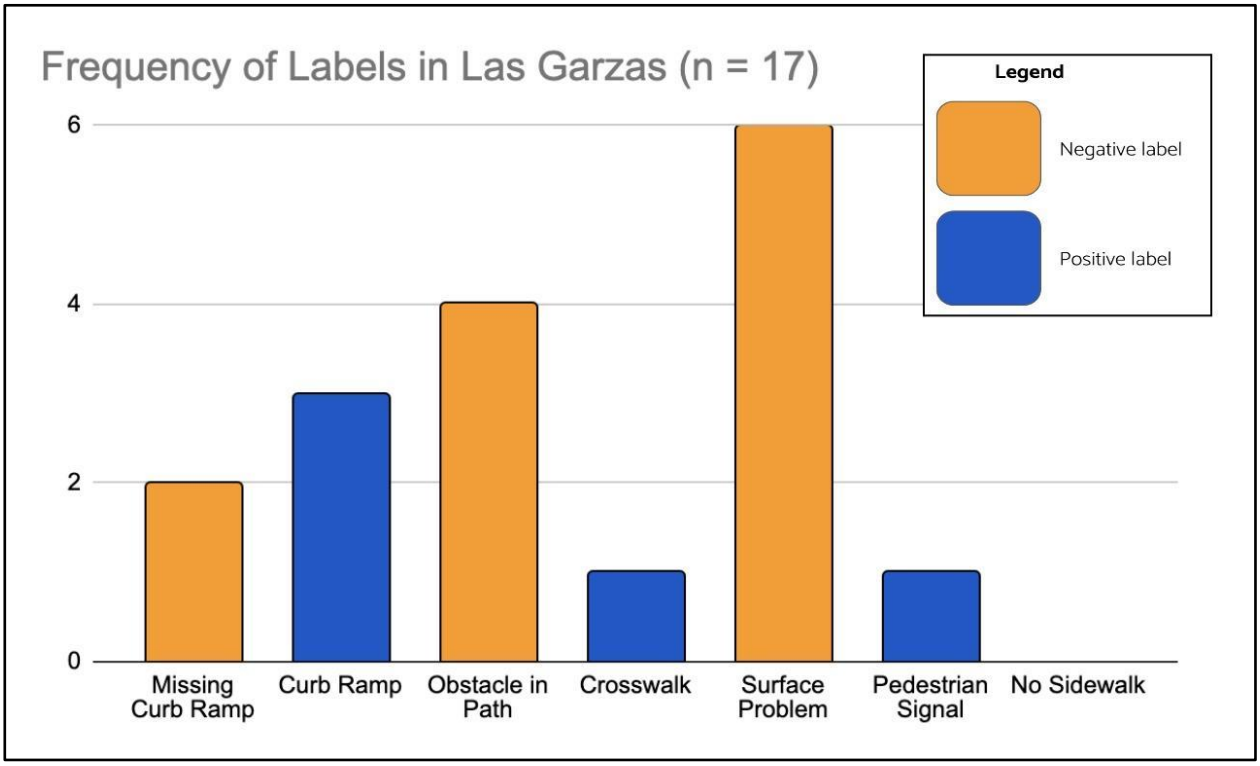
Luis Cordero Neighborhood

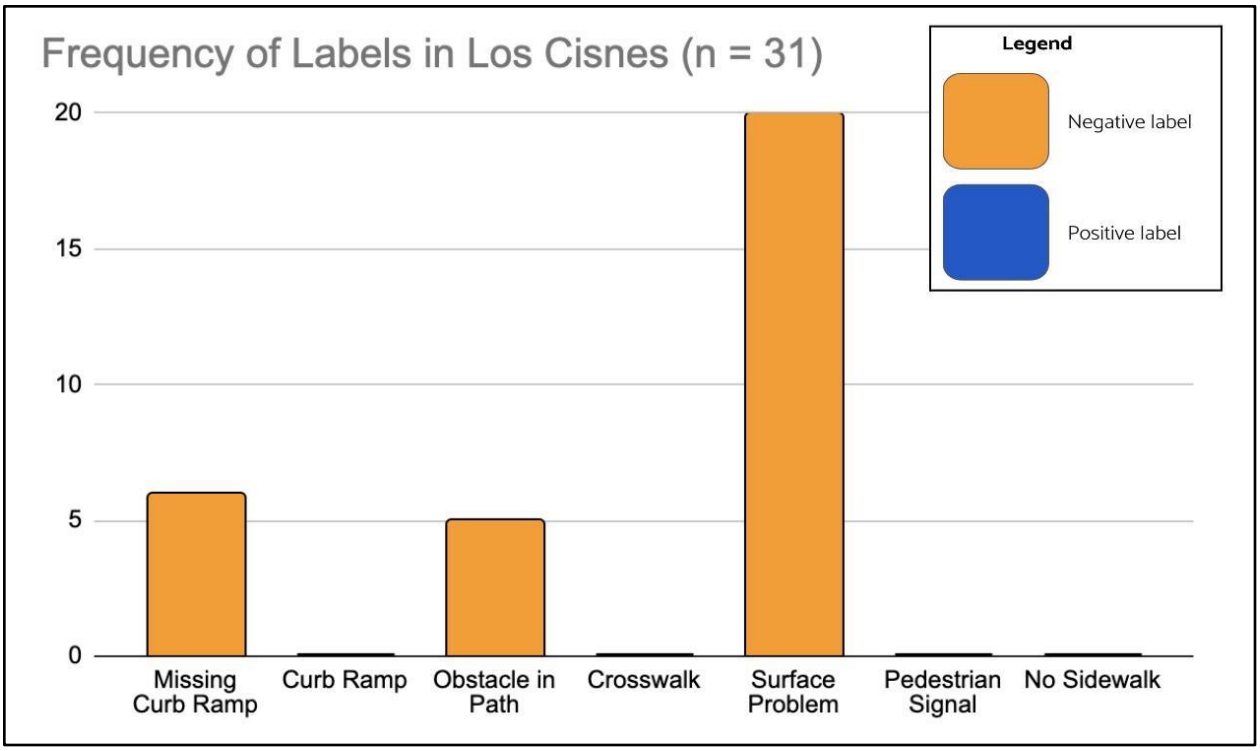
	Neighborhood: Luis Cordero			
	Street Name	Luis Cordero		Total Distance
	Distance (m)	850		850
	Strategy of Observation	GSV	In-Person	
Project Sidewalk Label	Curb Ramp	26	20	
	Missing Curb Ramp	5	6	
	Obstacle in Path	4	3	
	Surface Problem	51	45	
	No Sidewalk	0	0	
	Crosswalk	7	7	
	Pedestrian Signal	8	8	Total In-Person Labels
	Other	0	0	
	Total	**101**	**89**	**89**

	Neighborhood: Luis Cordero		
	Differences	Luis Cordero	Total
Project Sidewalk Label	Curb Ramp	6	**6**
	Missing Curb Ramp	1	**1**
	Obstacle in Path	1	**1**
	Surface Problem	6	**6**
	No Sidewalk	0	**0**
	Crosswalk	0	**0**
	Pedestrian Signal	0	**0**
	Other	0	**0**
	Total Differences	**14**	**14**

Appendix G– Graphs of Observations by Street

University of Azuay Neighborhood

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Legend
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Positive label
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10
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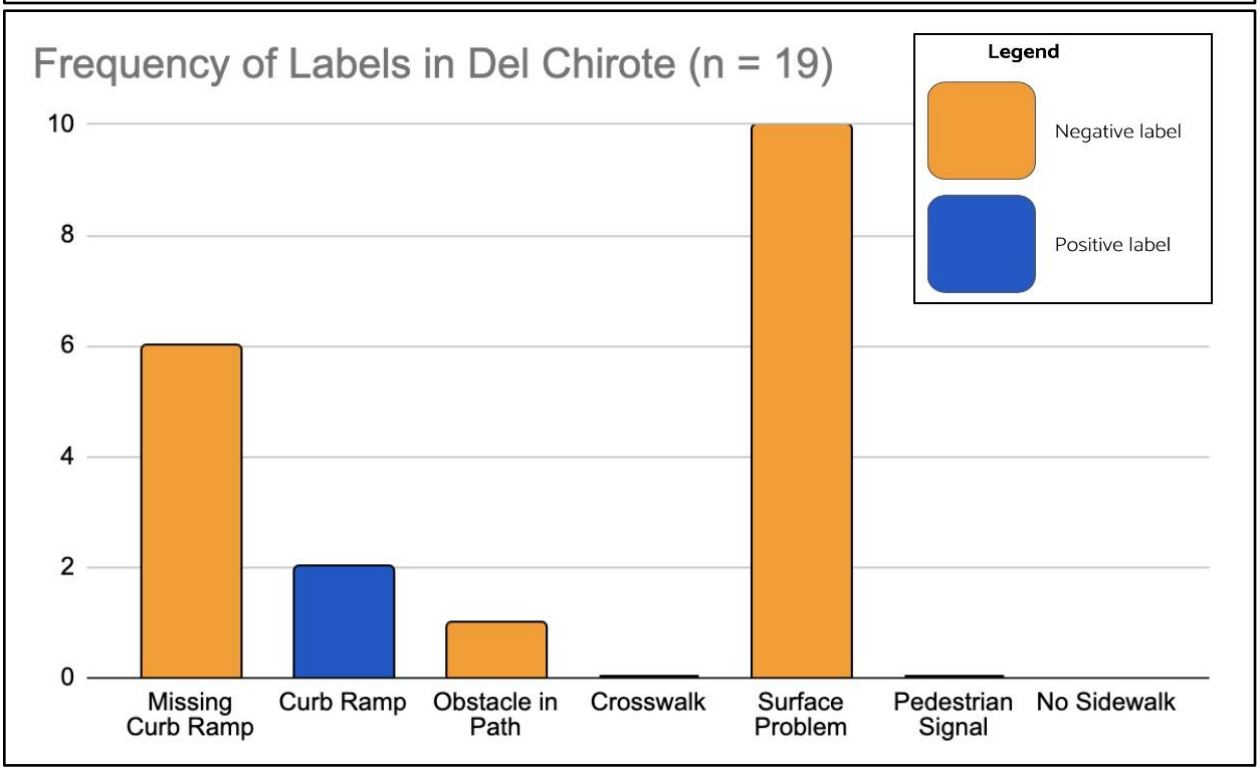
Curb Ramp
Obstacle in Path
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk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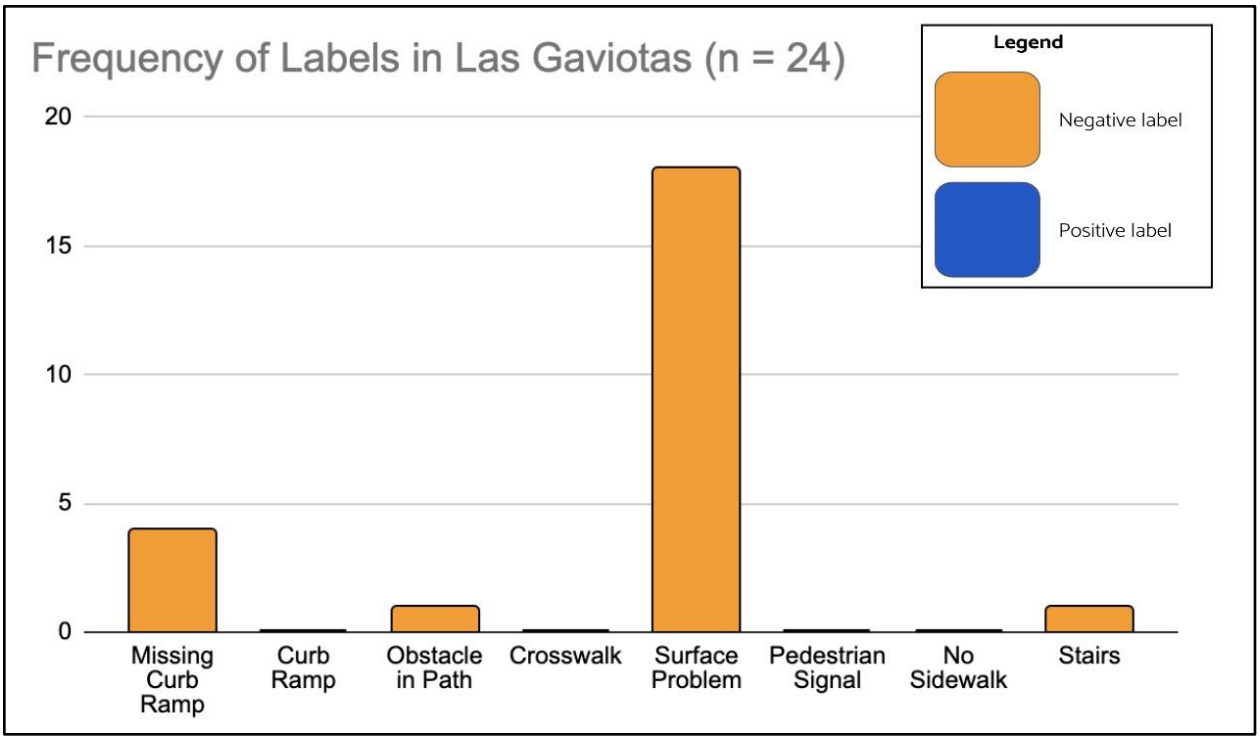
Curb Ramp
Obstacle in Path
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk



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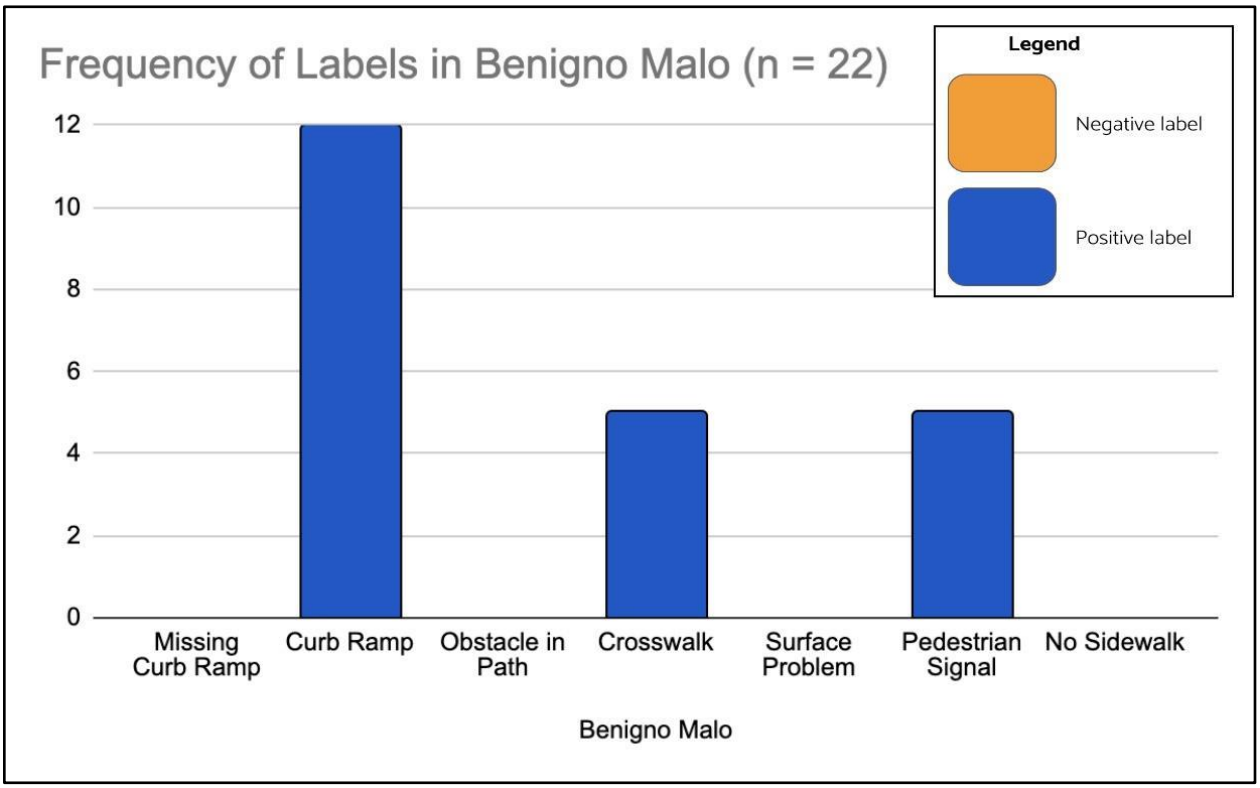

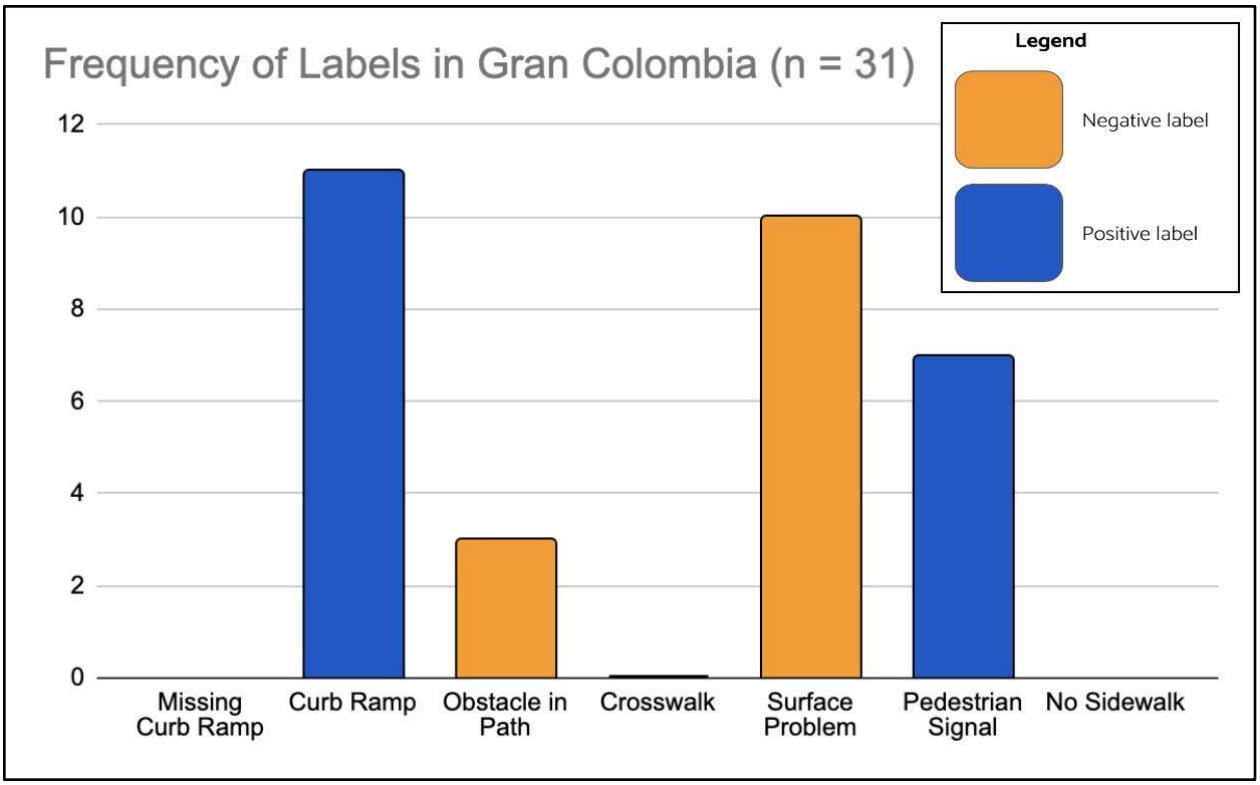
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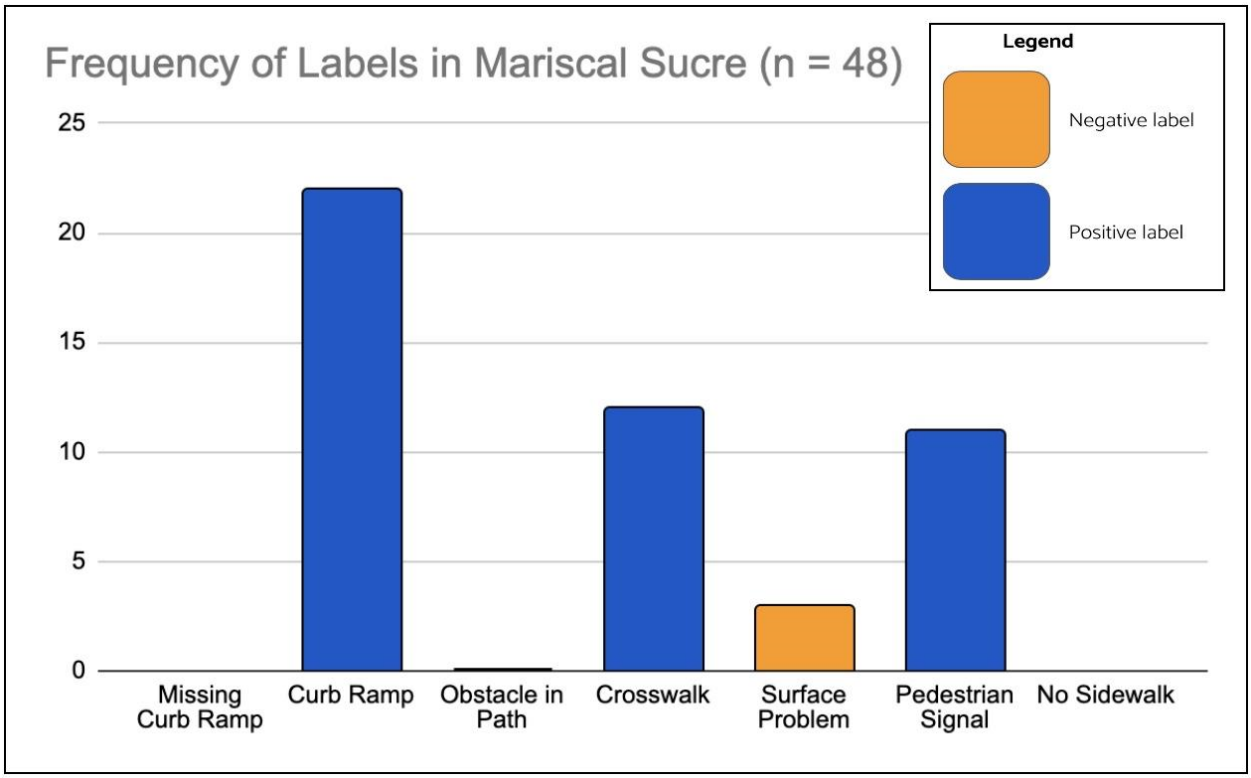
Pedestrian Signal
No Sidewalk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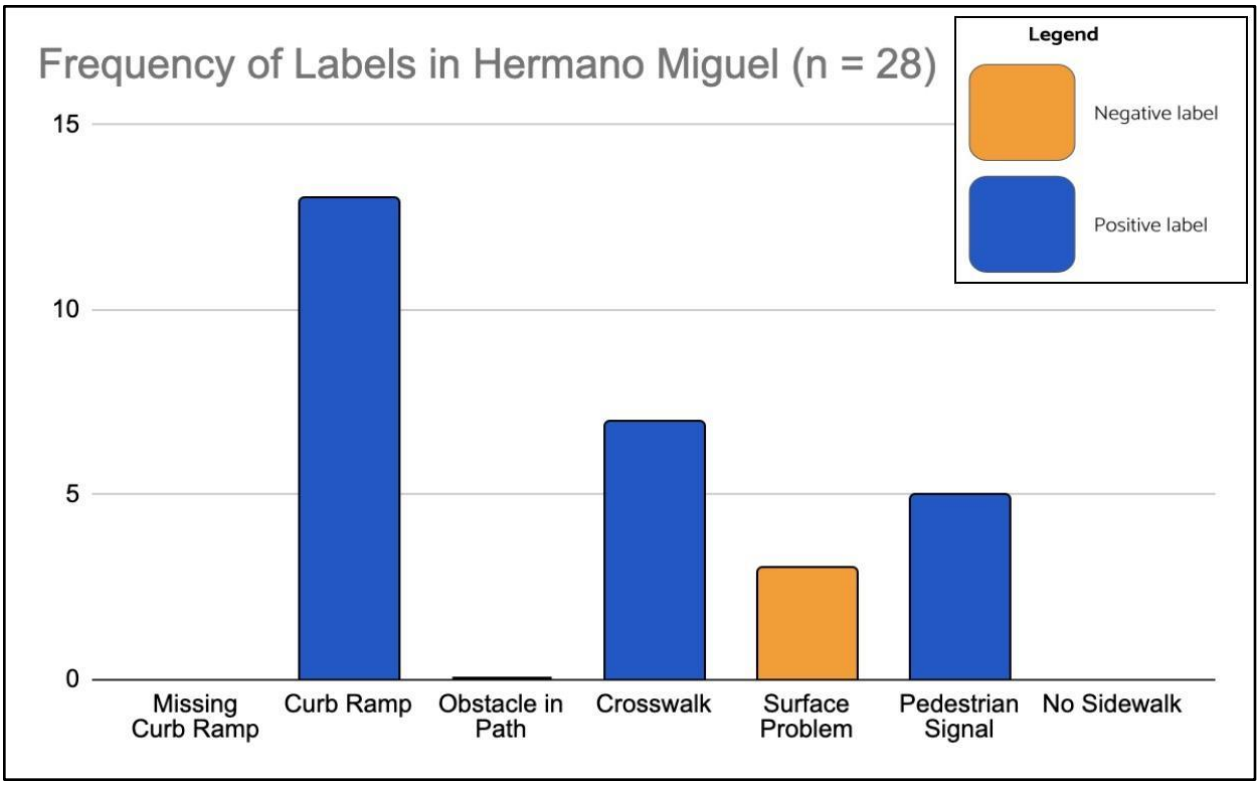
Pedestrian Signal
No Sidewalk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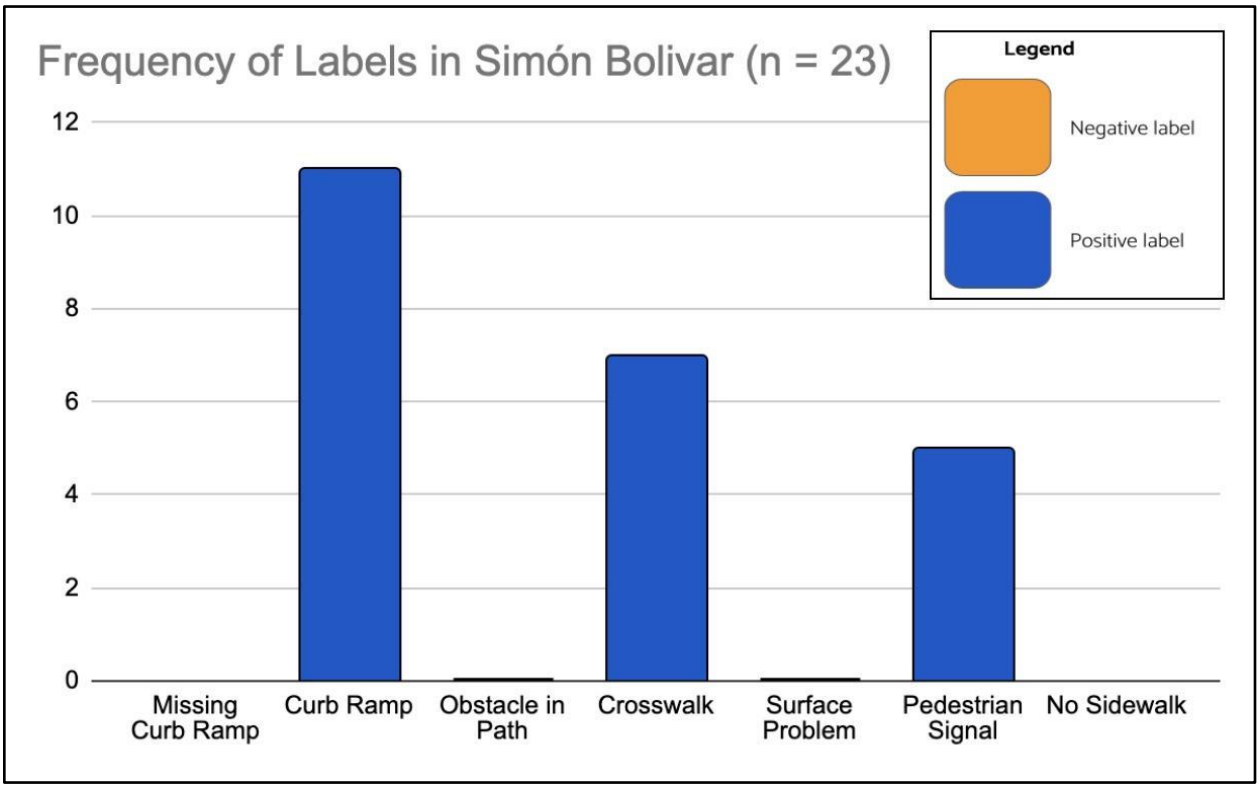
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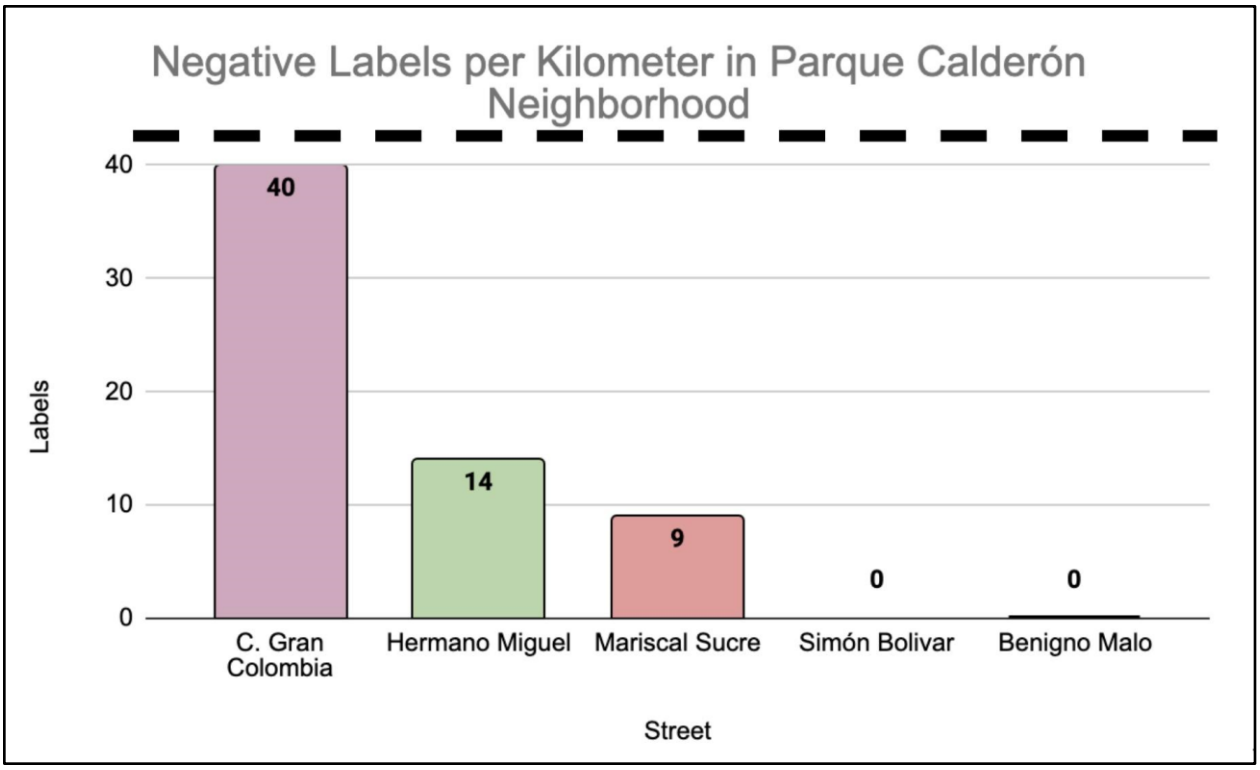
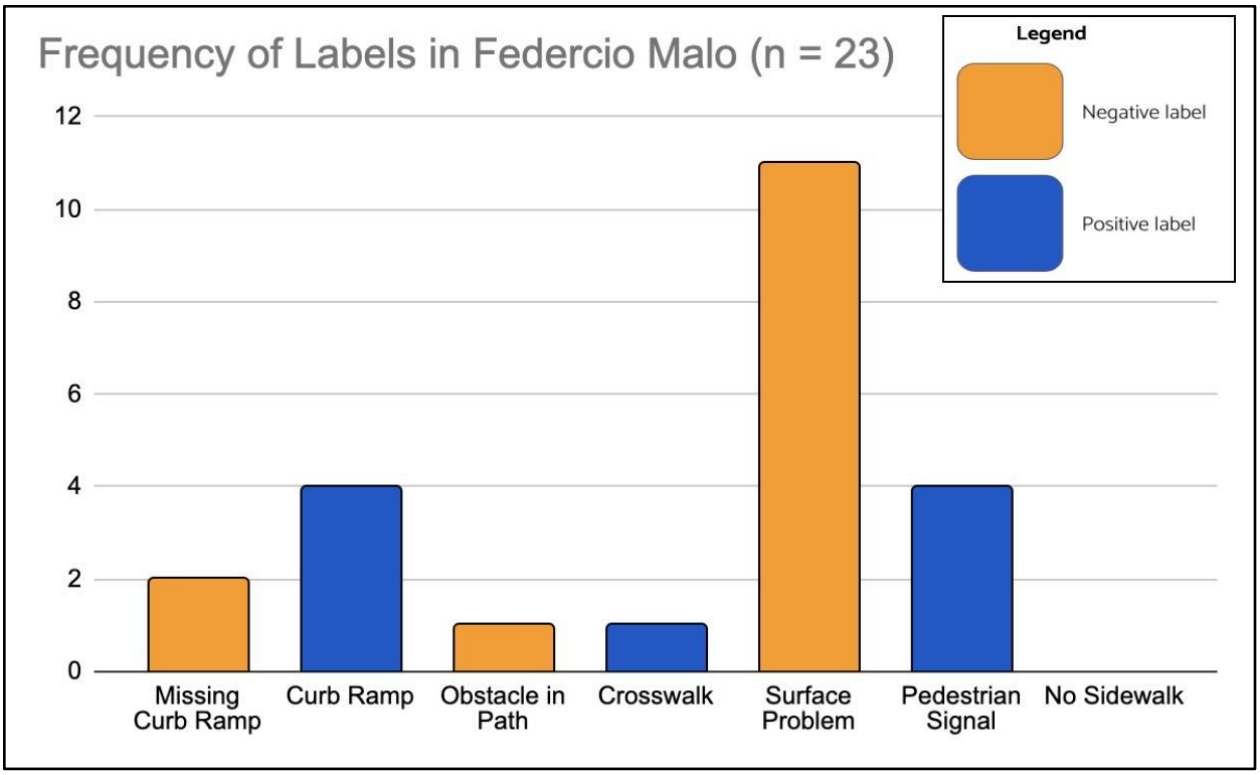
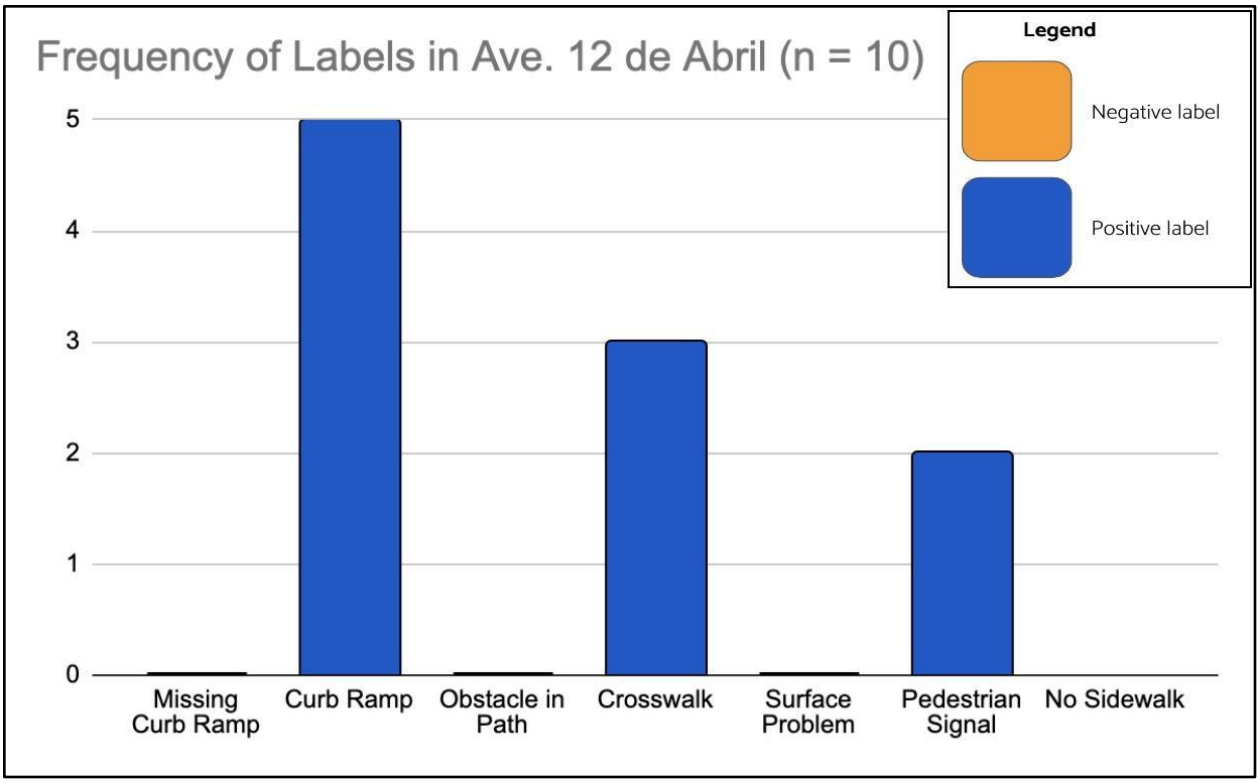
Obstacle in Path
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk



Avenida Solano Neighborhood




Frequency of Labels in Ave. 12 de Abril (n = 10)
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Negative label
Positive label
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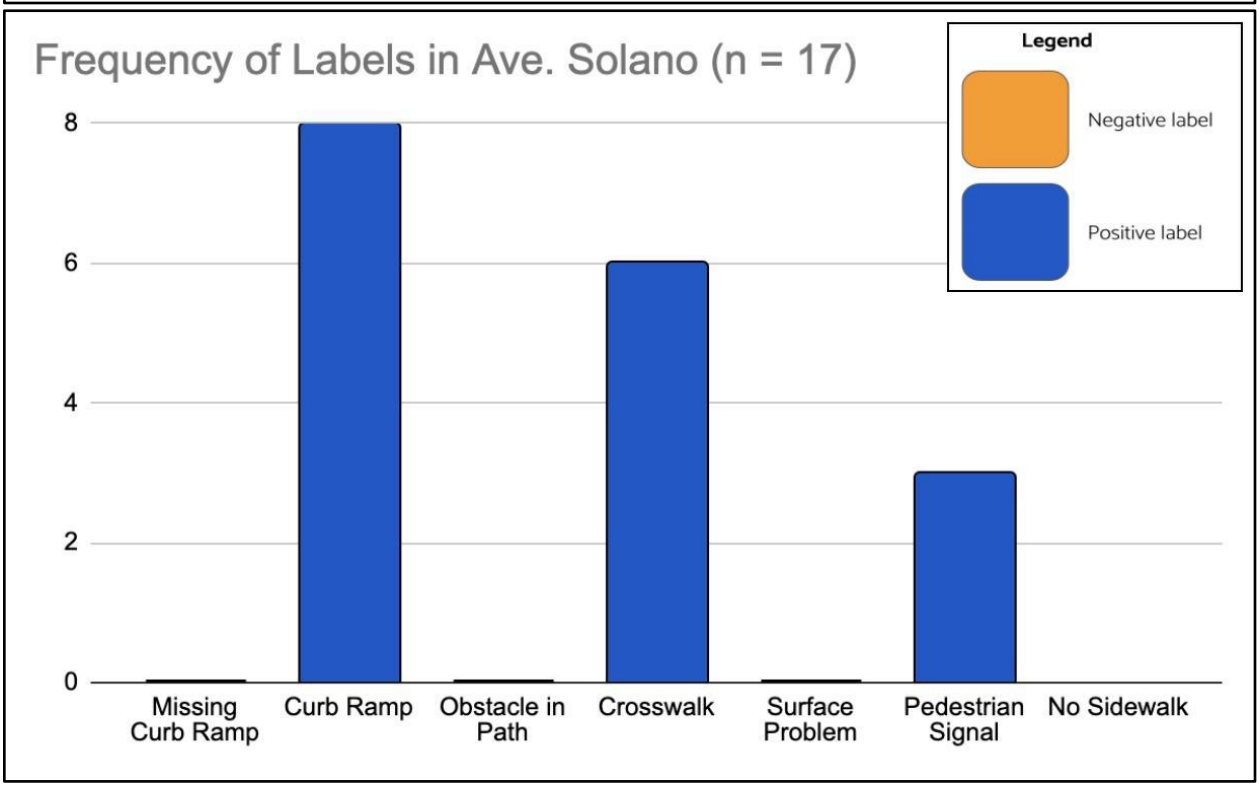
Obstacle in Path
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk


Frequency of Labels in Ave. Solano (n = 17)
Legend
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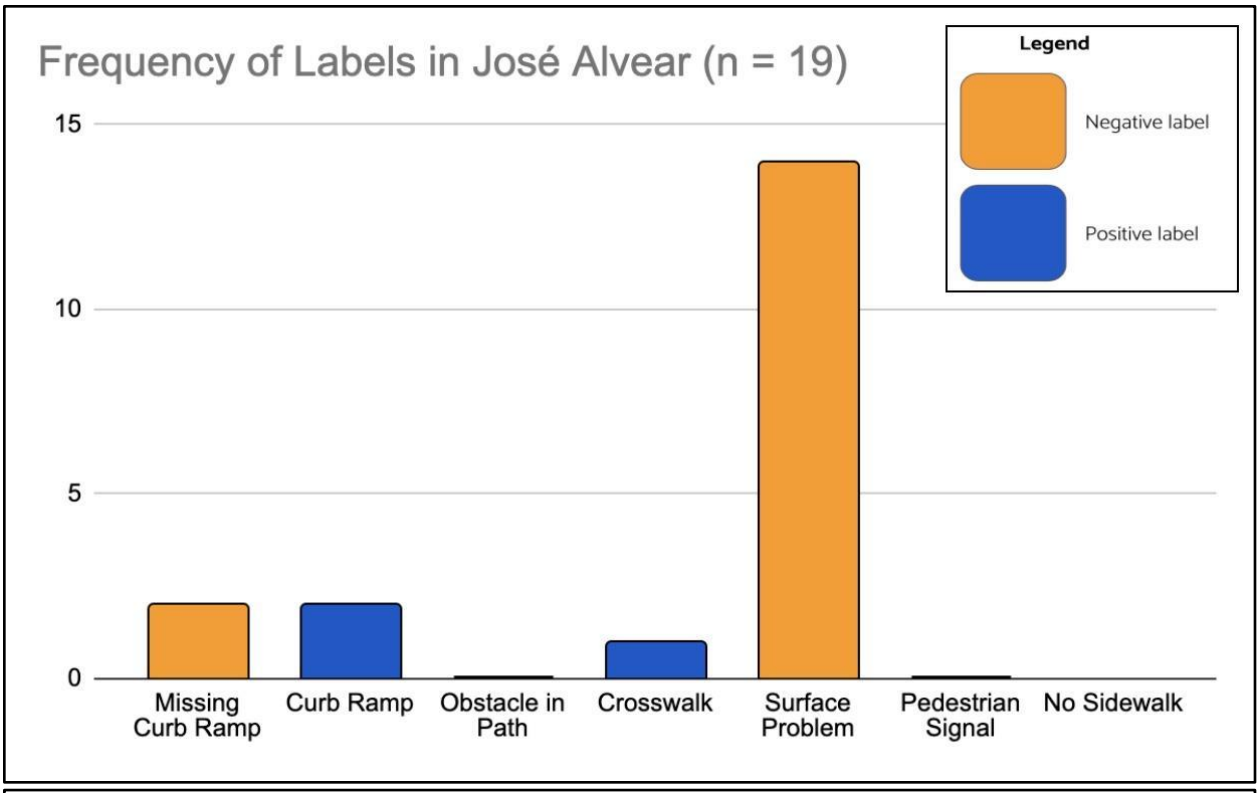
Curb Ramp
Obstacle in Path
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk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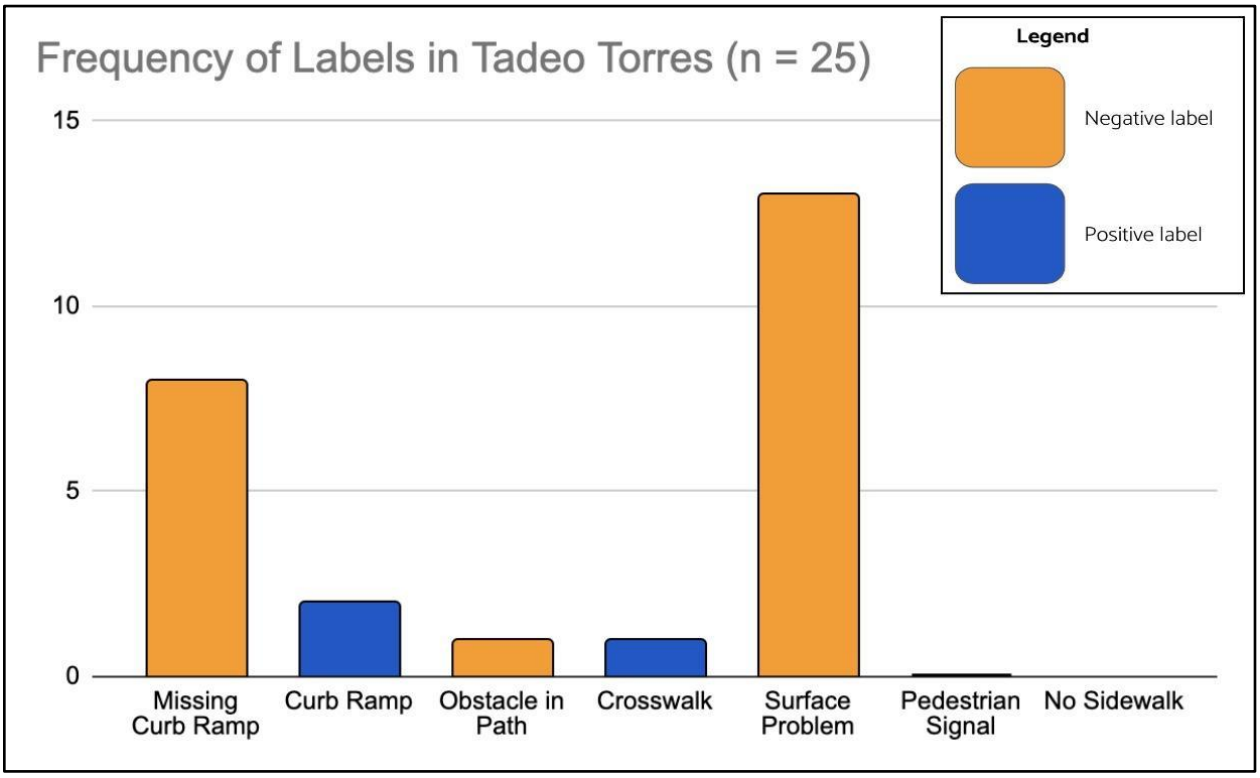
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk


Frequency of Labels in Tadeo Torres (n = 25)
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Positive label
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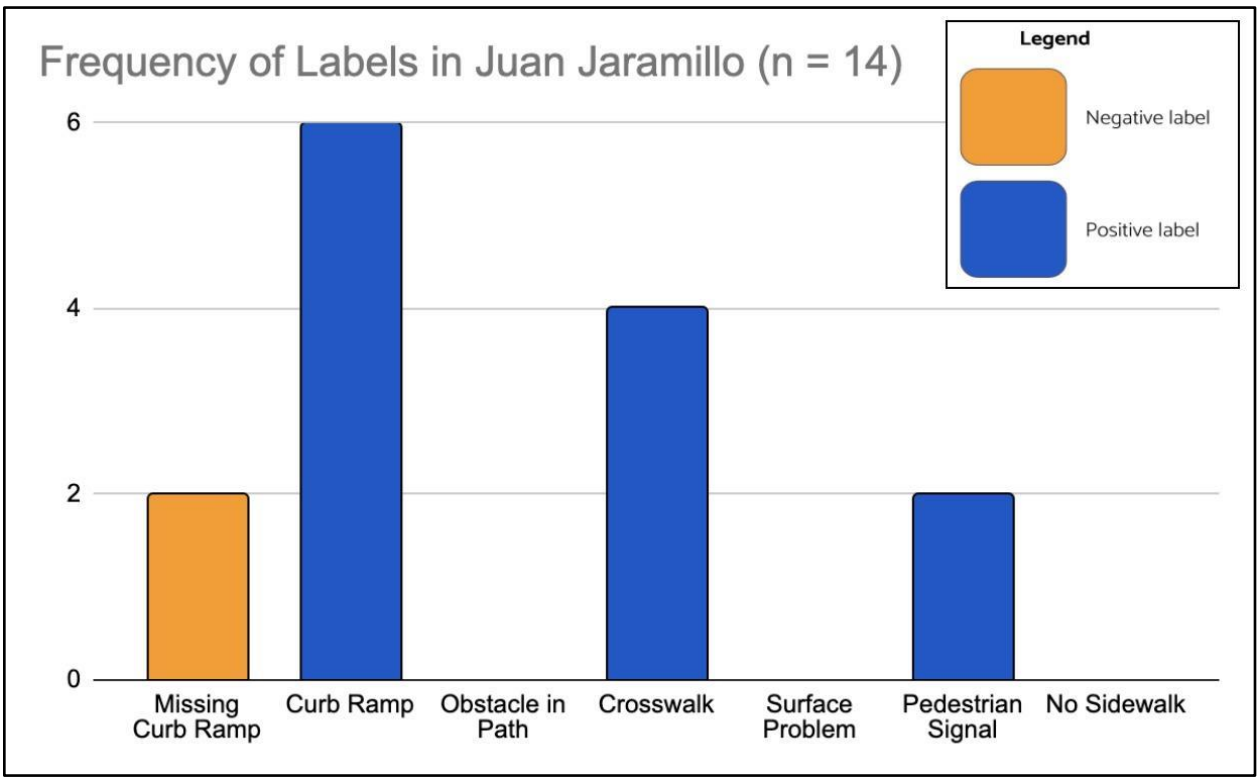
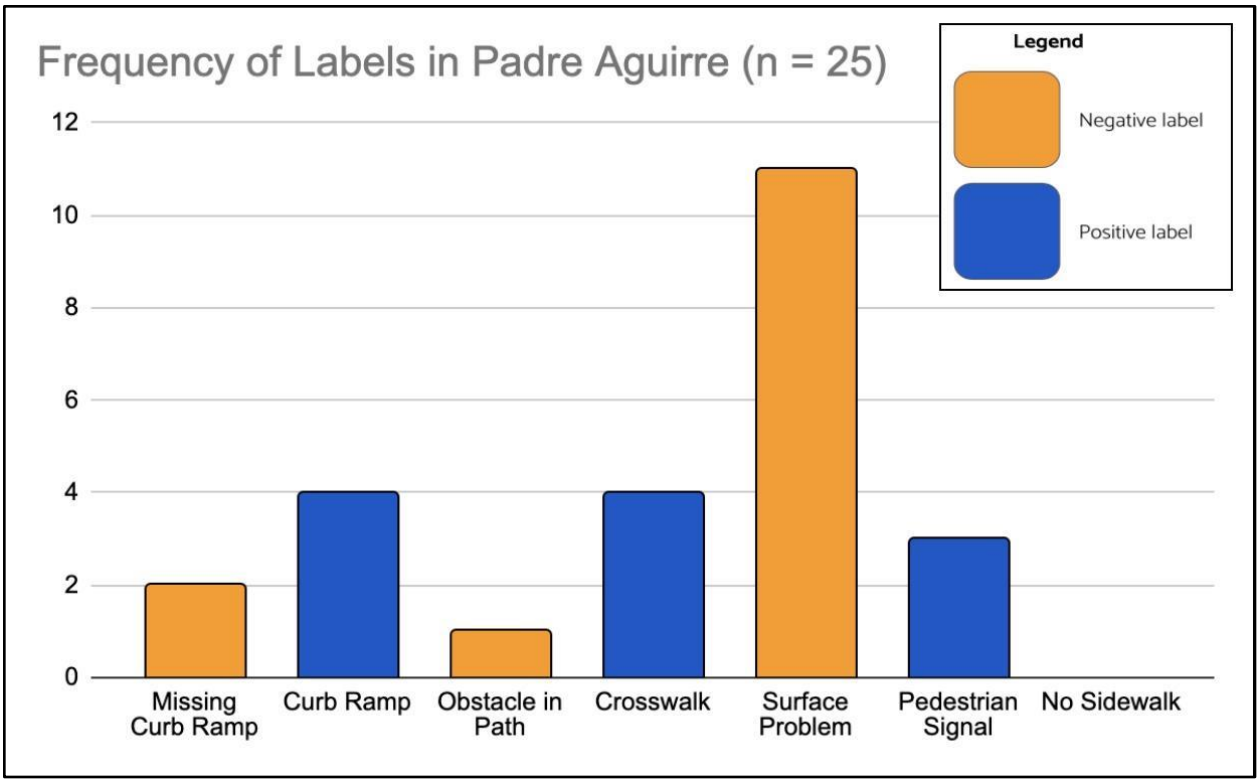
Curb Ramp
Obstacle in Path
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk

Calle Larga y Benigno Malo Neighborhood




Frequency of Labels in Padre Aguirre (n = 25)
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Negative label
Positive label
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6
4
2
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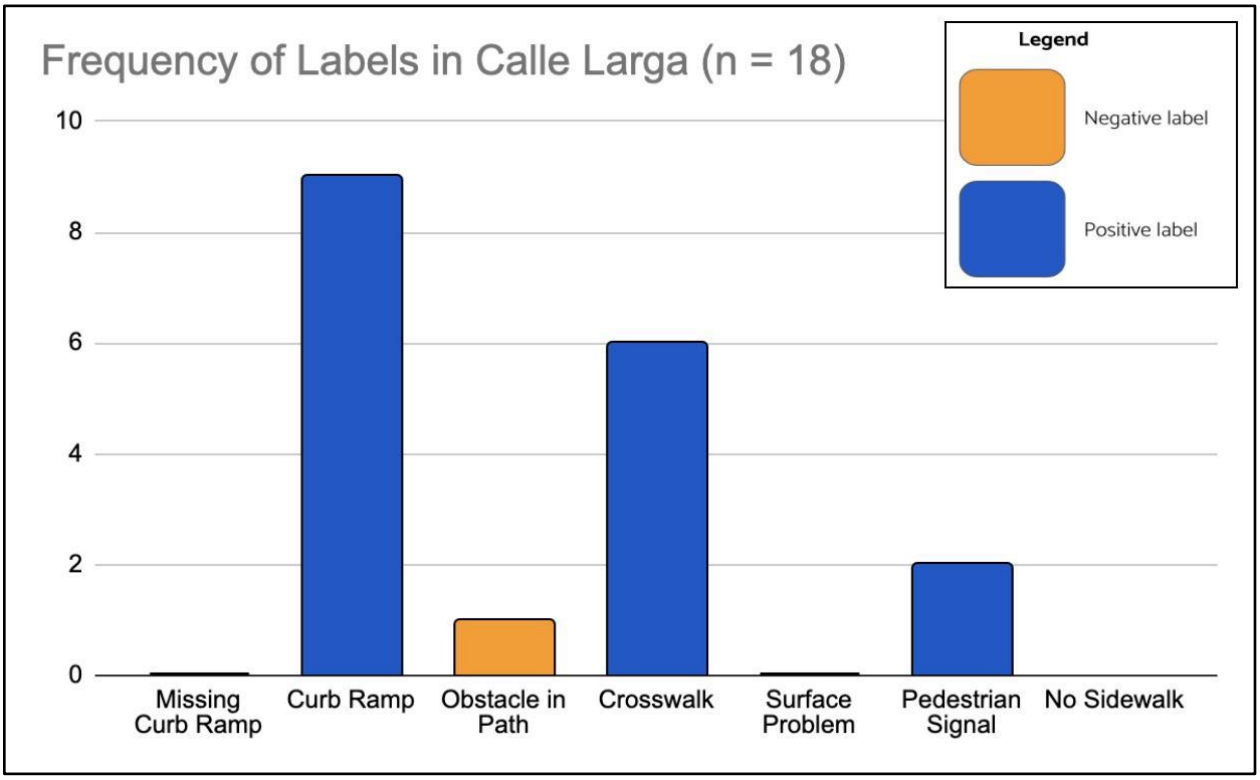
Curb Ramp
Obstacle in Path
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk


Frequency of Labels in Calle Larga (n = 18)
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Positive label
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6
4
2
0
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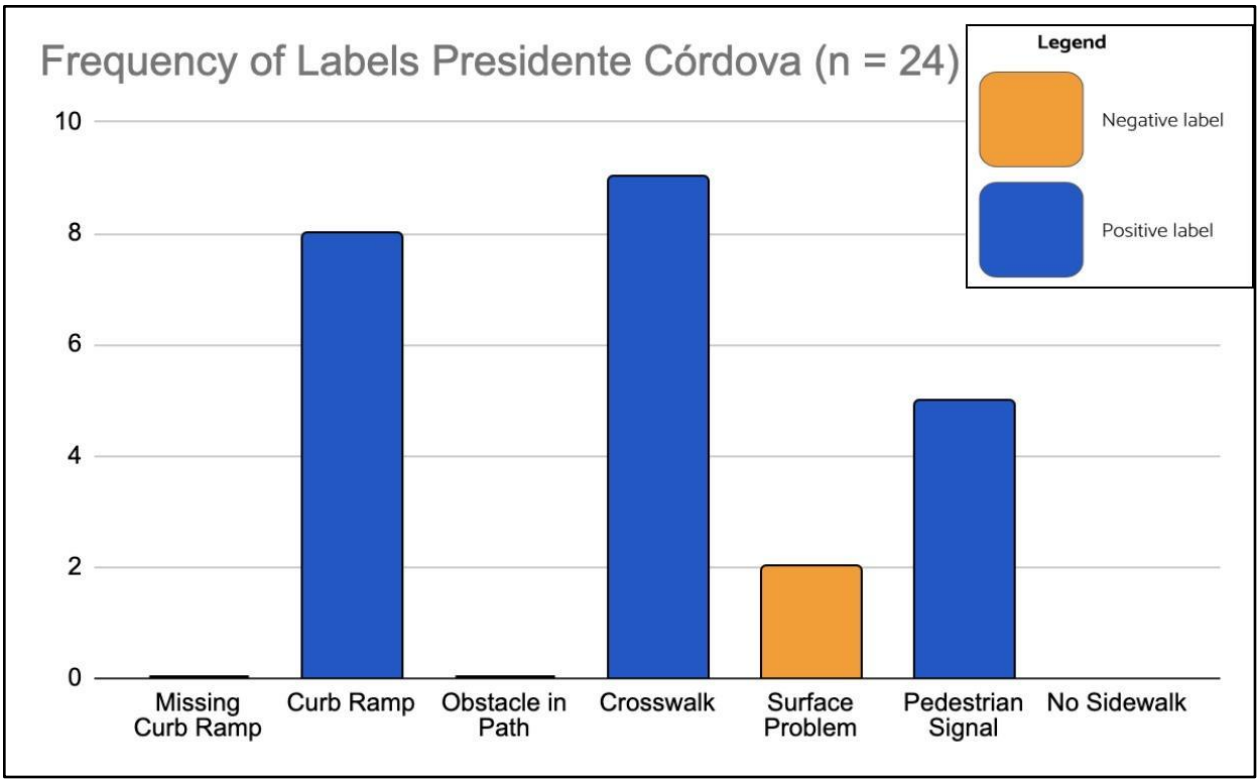
Curb Ramp
Obstacle in Path
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk


Frequency of Labels Presidente Córdova (n = 24)
Legend
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Positive label
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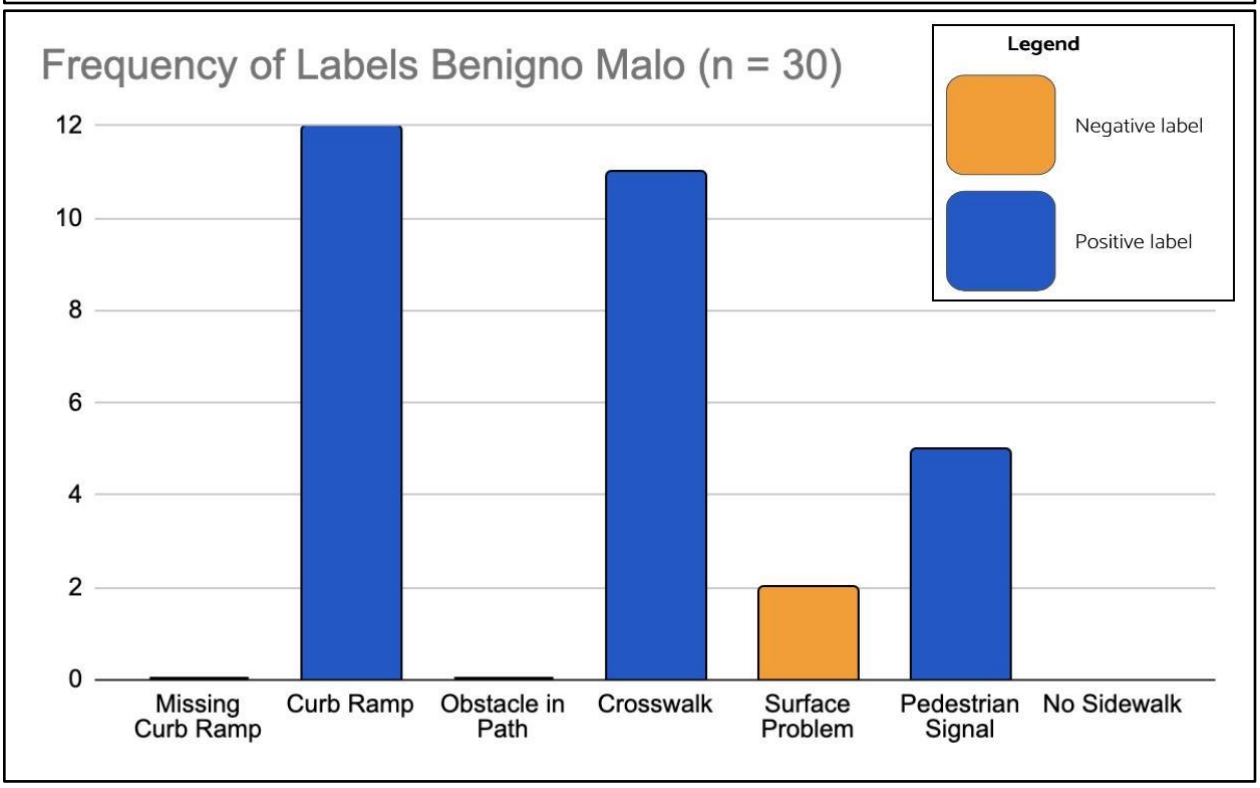
8
6
4
2
0
Missing Curb Ramp
Curb Ramp
Obstacle in Path
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk


Frequency of Labels Benigno Malo (n = 30)
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Positive label
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6
4
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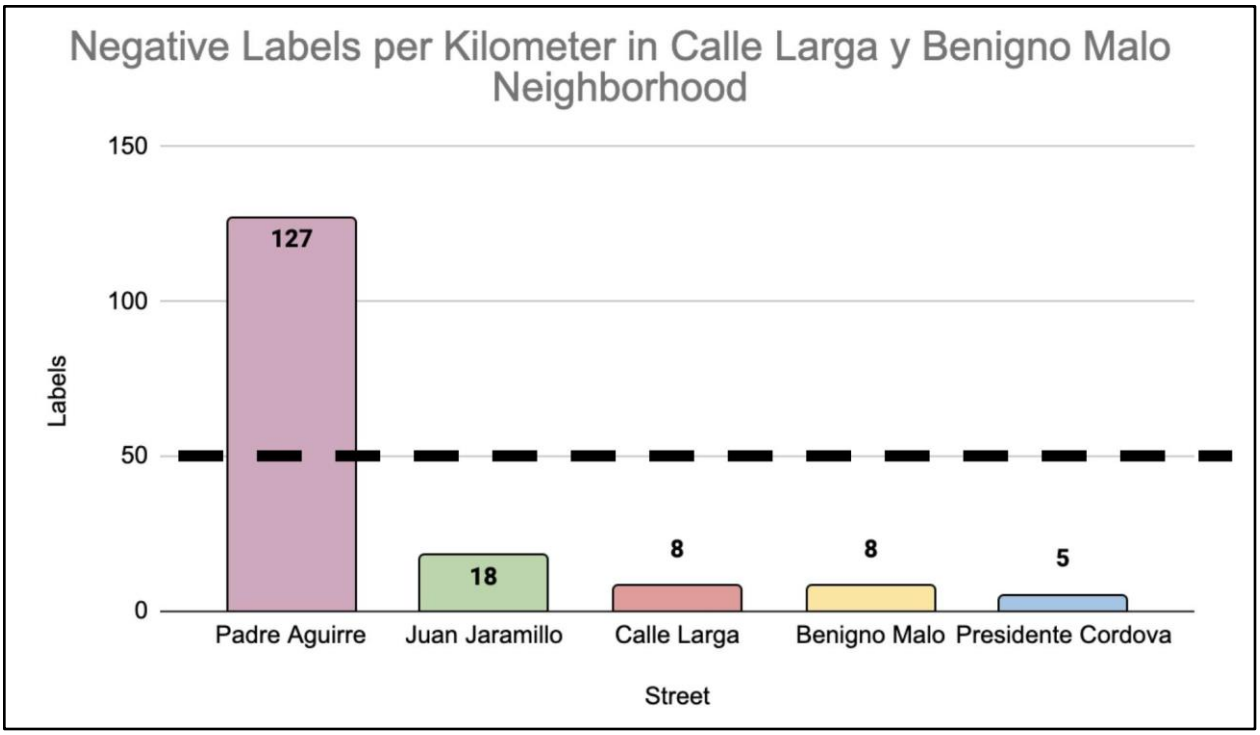
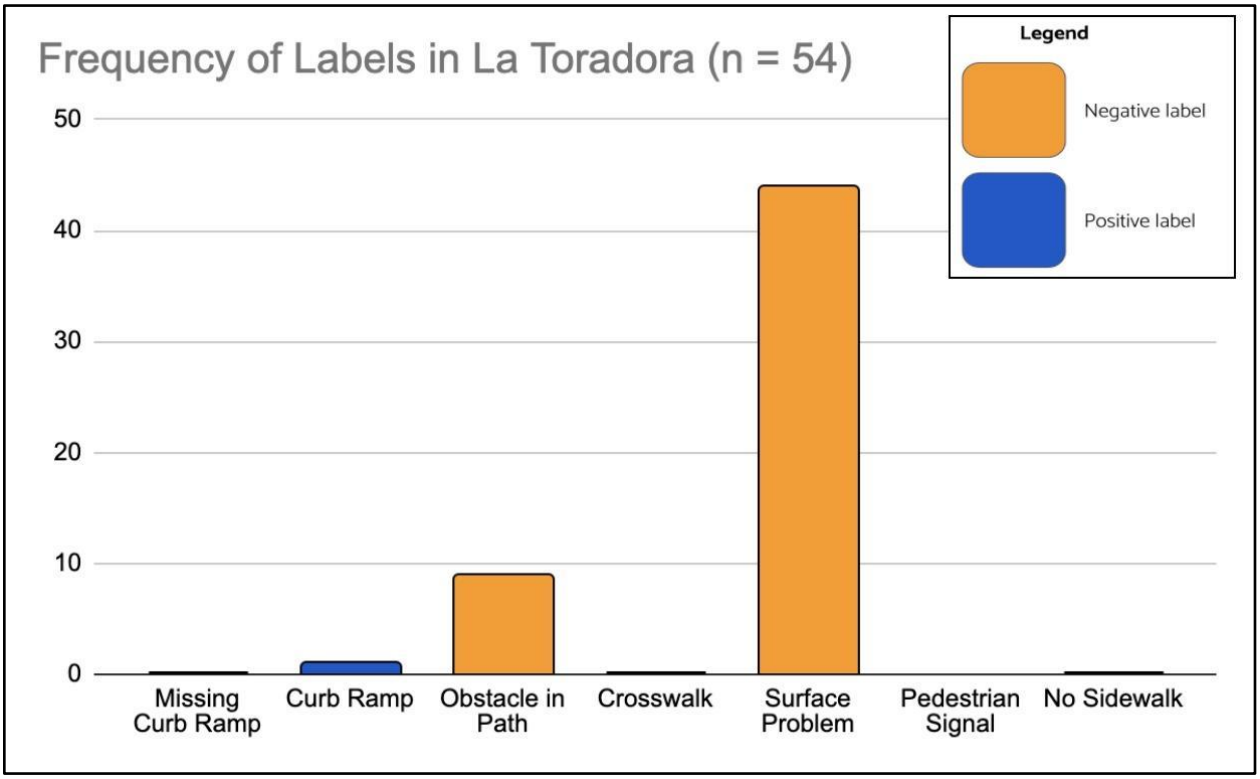
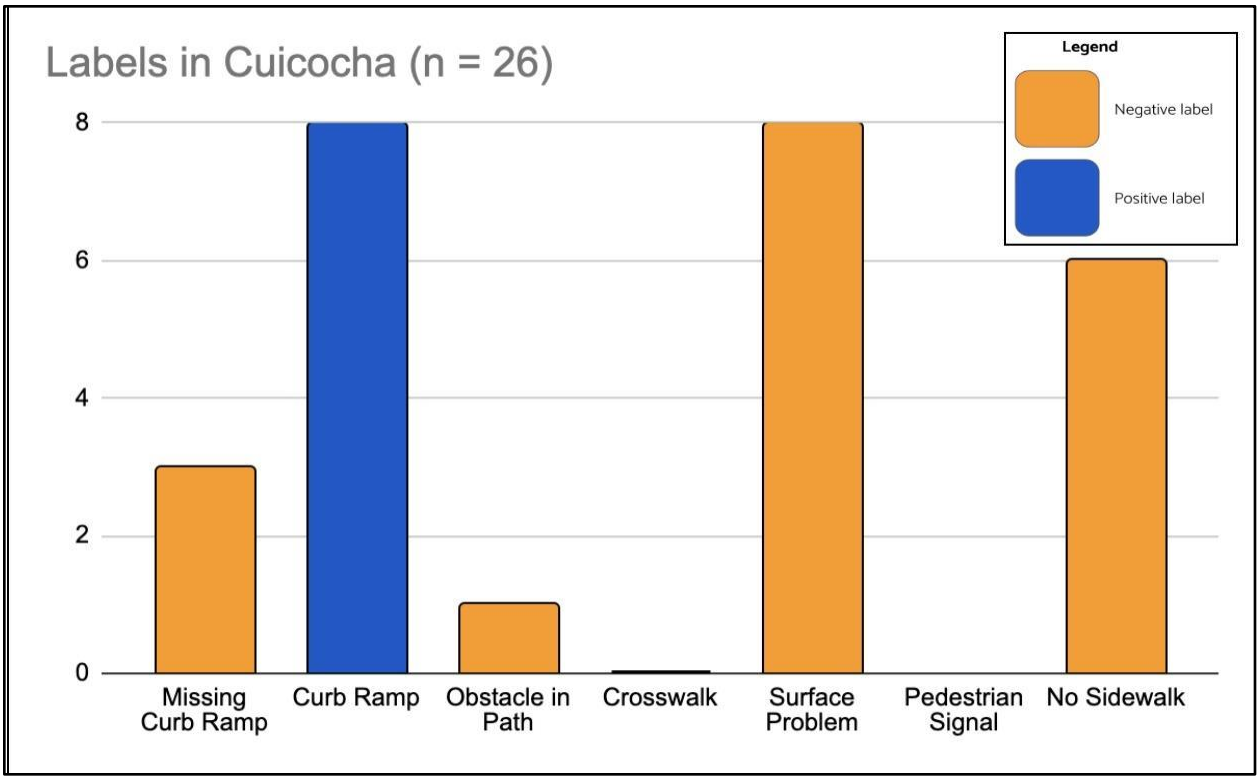
Curb Ramp
Obstacle in Path
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk



Quinta Chica Neighborhood




Labels in Cuicocha (n = 26)
Legend
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Positive label
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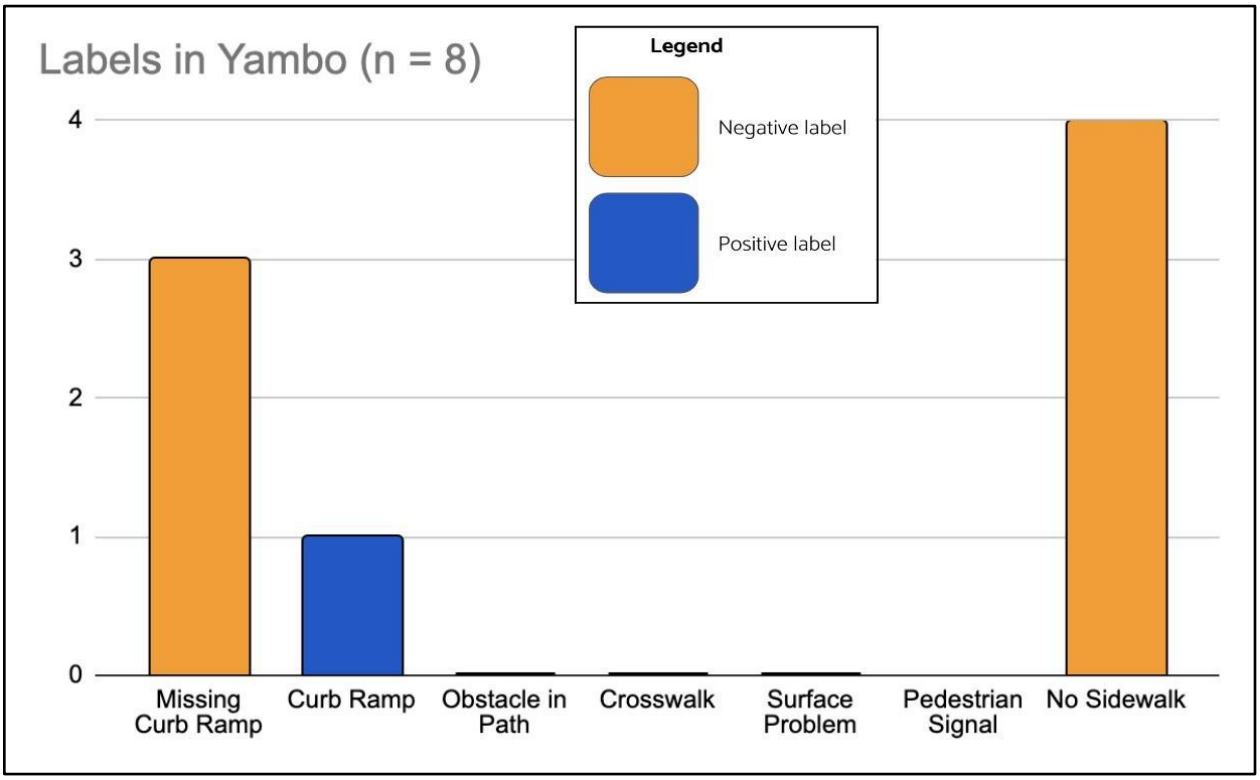
6
4
2
0
Missing Curb Ramp
Curb Ramp
Obstacle in Path
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk


Labels in Yambo (n = 8)
Legend
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Positive label
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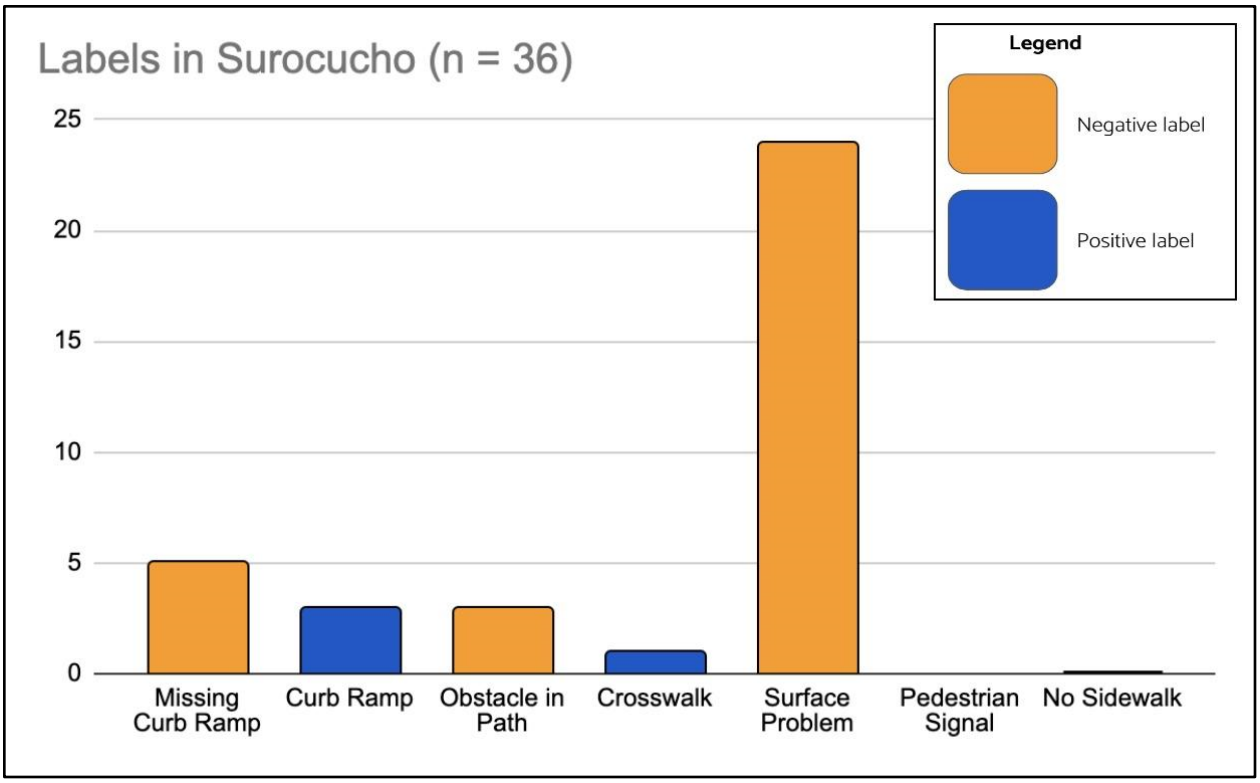
3
2
1
0
Missing Curb Ramp
Curb Ramp
Obstacle in Path
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk


Labels in Surocucho (n = 36)
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Positive label
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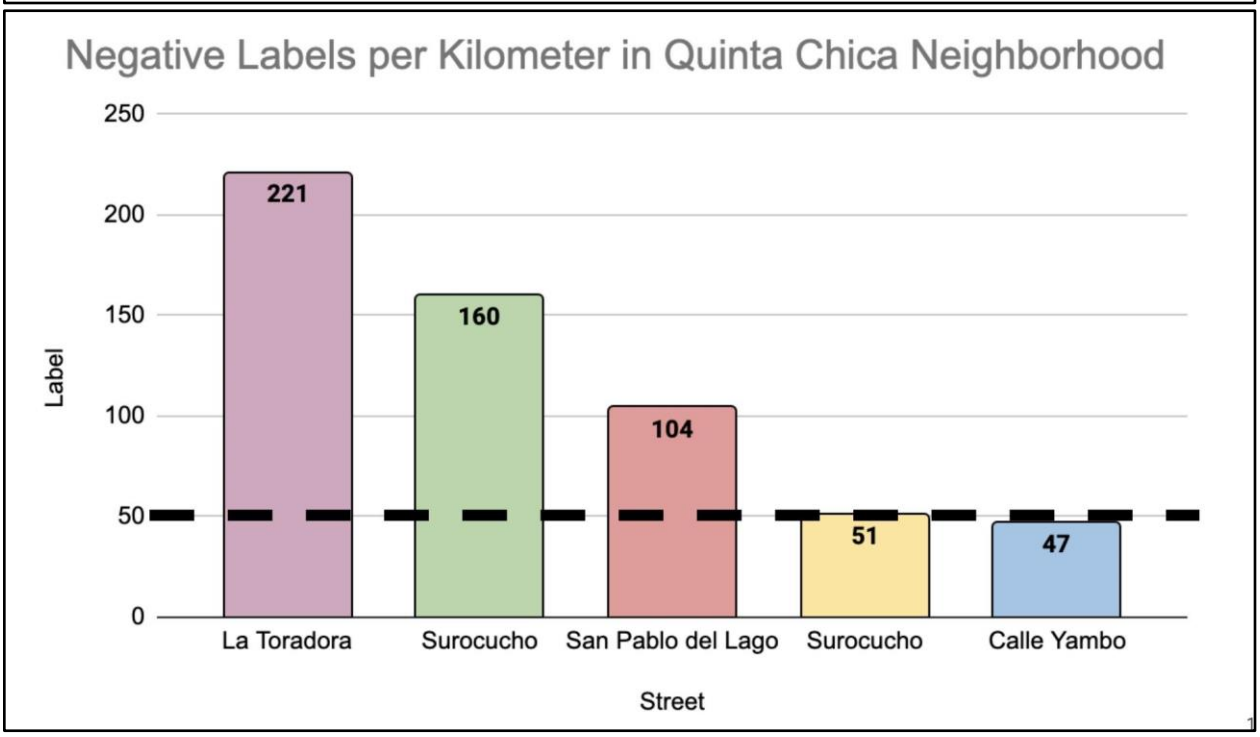
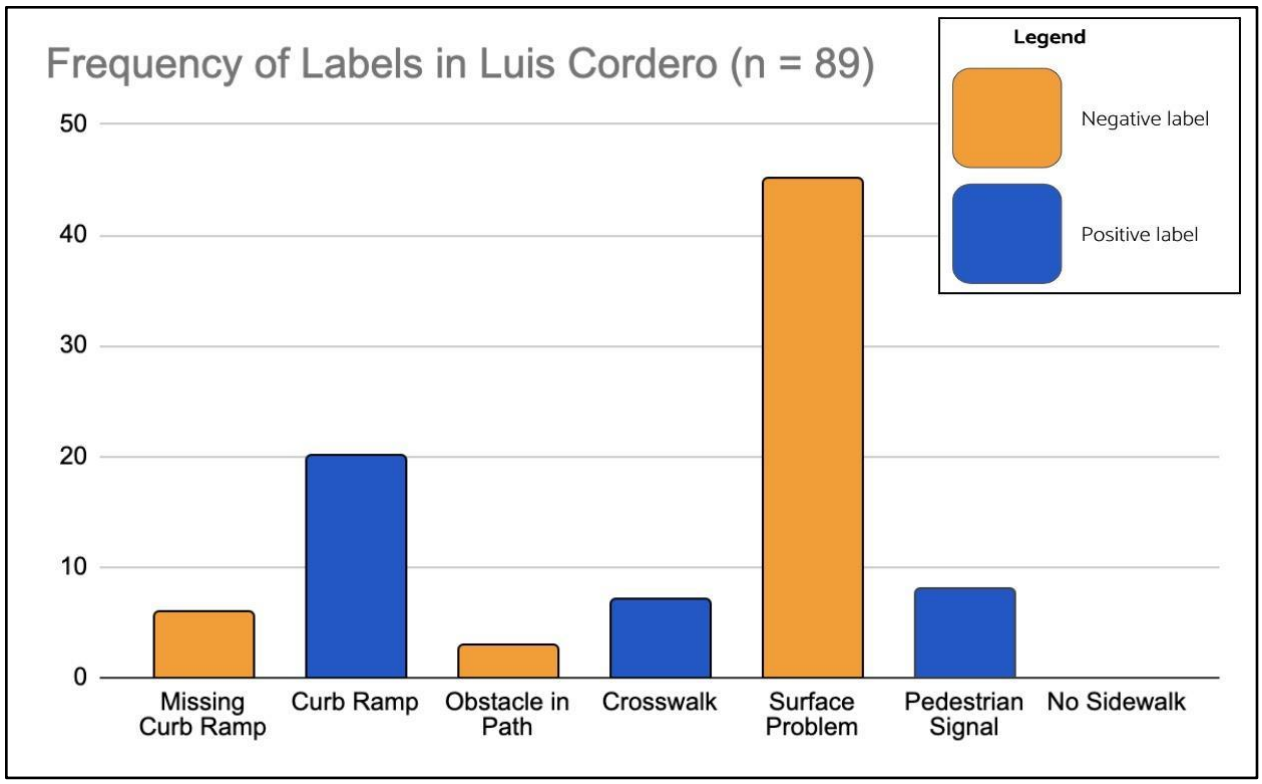
20
15
10
5
0
Missing Curb Ramp
Curb Ramp
Obstacle in Path
Crosswalk
Surface Problem
Pedestrian Signal
No Sidewalk


Negative Labels per Kilometer in Quinta Chica Neighborhood
250
200
150
100
50
0
Label
221
160
104
51
47
La Toradora
Surocucho
San Pablo del Lago
Surocucho
Calle Yambo
Street

Luis Cordero Neighborhood



Appendix H– Interview Transcripts

Professor Daniel Orellana and Elisa Bustos

Interview Transcript
Professor Daniel Orellana and Elisa Bustos
March 21, 2023, 12-1 pm in UCuenca's Llacta Lab.

Sam: We have just a little bit of an introduction. So, hi, we are a group of college students from Worcester Polytech Institute in Massachusetts in the United States. We're currently working with EMOV EP to assist in their efforts to increase street-level accessibility in Cuenca by determining low-cost solutions.

We would like to ask you a series of interview questions regarding constraints with improving street-level accessibility in Cuenca. We hope to learn about the feasibility of implementing potential solutions. The interview will take approximately an hour, but time might vary depending on the flow of conversation.

Gachau: There's no anticipated risk to you and no direct benefits for participating, and your responses will help us better understand the accessibility problem and identify potential solutions. And, like we already said, this interview will be audio recorded, so thank you for your consent to that.

You have the right to decline the recording. Your name and job title may be associated with your responses in our project report, but you also have the option to remain anonymous. Your participation in this interview is completely voluntary, and you have the right not to respond to any interview question. You should inform the interviewer if you'd like to end the conversation at any time.

Gio: The goal of this interview is to gain expert insight about accessibility challenges in Cuenca and the feasibility of implementing low cost solutions. Specifically, we would like to get feedback about access mapping as part of a potential solution.

If you don't know what access mapping is, it involves an application through a smartphone. And you're able to put what type of constraint you have: if you're a wheelchair user, if you're a cane user, if you use a motorized scooter. Let's say you're trying to get from point A to point B. Instead of giving you the fastest route, the app already has data on the city's inaccessibility and it is able to allow you to avoid any inaccessible areas that would be an obstacle. For instance, a sidewalk that is too steep for a wheelchair user or just anything of that sort. So, this has been implemented in Seattle. And the way that you would get this data, um, would be through an application called Project Sidewalk, which is what we are trying to implement here in Cuenca.

It's been implemented in many cities in the US and it's actually been implemented in other Latin American cities in Mexico as well. And we've been in contact with them and they're very interested. We're actually gonna have a meeting with them today.

[Demonstrating the app using his computer] So, how it works is you're able to virtually audit streets using Google Street View, and you can rate the streets. You can say if they're missing curb ramps, if there's an obstacle in the sidewalk, if there's no sidewalk, or if there's uneven surfaces or the surfaces are broken. And you can give different ratings for the severity of it.

And the end goal with this is to have a map that has labels throughout the city that shows how many missing curb ramps, how many obstacles, and whatnot. And basically the data is open source. So either the government can use that data to know which areas need more improvement or you can use it for creating applications such as access maps to help people with mobility impairments. So that's the whole gist of what this interview's gonna be.

Sam: So, we have a list of predetermined questions.

Orellana: Okay. We should both jump in?

Sam: Yes. So the first one, just sort of general, what is your job title and experience with infrastructure and/or accessibility?

Ms. Bustos: Okay. I'm an architect. And I've been working on research on accessibility. We did the paper about the city, and right now I am working on accessibility at the university campus.

Orellana: So my name is Daniel. I'm actually a biologist, so not really close to the subject, at least in my basic training, but I did my master's and my PhD in geo-informatics and geo-spatial analysis. So, [I have experience in] the mapping stuff and developing tools and methodologies for accessibility mapping specifically. But, mapping in general and specifically in the building environment. So I have some experience with mapping in different environments, specifically in natural areas like natural parks and so on. But, also in urban and built environments.

Ilana: If we want to go more in-depth into that, if you could each tell us a little bit more about what you do, some of your big accomplishments, just any other information you want to add.

Ms. Bustos: Yeah. So, we did my thesis on the accessibility of the streets in Cuenca. That was my undergraduate thesis to become an architect. We did the study– you guys read the article. We did the study in 214 street segments to determine how accessible it was.

And right now I'm a researcher here at the University. And like I mentioned, we're working on kind of the same thing but for different campuses at the university so we can implement changes for more students with disabilities.

Orellana: I think what is interesting about this project is that we were wondering if there were differences between people assessing the same streets and how these differences arise. We advised some interesting experiments in the sense that, for example, the students who were volunteers for the first assessment, the first time, they just went by themselves with a form we prepared. Then they repeated the same exercise, but pushing a stroller with some weight. Like a rock, something that gives weight. So, the stroller was heavy. And it was very clear looking at all the metrics that they detected other obstacles that they were not able to detect in the first assessment. And the third assessment was with wheelchair users: people with disabilities.

And it was very clear that there were differences. Basically, the street audits are strongly dependent on the [mobility] abilities of the people who are auditing. Also, we tried to use a goal review [a checklist] for assessing accessibility. But it was very difficult because there are very subtle features in the streets that could render a place completely inaccessible. For example, in the checklist, there was [a category for] accessible ramps. You see a ramp and it seems okay, but only when you are in a wheelchair can you check if that ramp specifically works or not. There could be just three centimeters of difference, but it could change everything.

Also, it was interesting to see, wheelchair users were more skilled in navigating the city. So for us, the main idea was that the people involved in using the street [i.e., actual wheelchair users] should be the people who assess it [in our projects].

Yes, sorry, just one other thing. Because I work with Google, specifically working with Google Street View projects, I'm pretty familiar with how the technology works and the limitations that you may have. So, we used it during the pandemic, and contrary to what we learned from the literature, at least here [in Cuenca], it is not working very well. This could be because the imagery is not updated. Or, it could be because there are specific features that are difficult to capture.

There is another methodology called maps, or mapillary. I don't know if you know about it. Mapillary was developed in the States and we adapted a version here for Cuenca. It's not specifically geared towards accessibility for people with disabilities, but it gives a comprehensive evaluation of the pedestrian environment. There were reports that using Google Street View imagery would produce comparable results to in-person. So, initially we were very happy because we were in the middle of the pandemic, and we started working with Google Street View. But then we compared with the previous results and the inter-user reliability was not good. So, at least for the case of Cuenca, we decided not to use Google Street View for any assessment [and to instead use mapillary when we need to].

Ms. Bustos: Also, something important about our research– you mentioned that in your app you can qualify if the obstacle is difficult or how difficult it is– that was something really interesting we came up with as well. It really depends on the difficulty of the obstacle to know if you can travel the route or not. For example, if you're a wheelchair user, you just can't use the stairs. So, it's really important that you can qualify whether you can achieve the obstacle or not.

Gio: Yeah. For example, let's say you're putting a curb ramp on Project Sidewalk, you can add text to say if it's too steep or if there's not enough of a landing zone or if it's not wide enough. They have different tags that you can use to describe what might not be the best about the ramp.

Ms. Bustos: So, next I have a question for you.

Gio: Oh, sorry. Of course.

Ms. Bustos: It's interesting. So, I was wondering, with this app, based on your disability, can you tell the app, these are the disabilities I have– what can I do?

Gio: Yeah. So, Project Sidewalk is an application that is used to compile a lot of data. And then, since it's all open source and anyone can access the data, it can be used to create navigating tools like Access Map. So, in the Access Map application, there you can select your disabilities and it will provide an accessible traveling route. I can show you really quick actually *[takes out laptop to demonstrate].*

This will give you more of a visual representation. So, this is the Access Map application based in Seattle. For example, let's say you want to go from Pioneer Square to the hospital. On Google Maps, it will just tell you to go straight there. You'll have to make a right and go that way. But, over here *[using access maps],* if you go straight, you'll run into a hill, which is inaccessible for a wheelchair user. So, in the app, you can select if you have a wheelchair, powered scooter, or cane and it actually gives you an alternate route that will be easier to use.

Orellana: So, this is for physical disabilities– not really for visual or hearing disabilities?

Gio: Yes, it's more for physical disabilities. So that's how the [Access Mapping] app would work. And then this is Project Sidewalk *[demonstrates on laptop].* Basically, you have all these labels that you can audit with. [You can identify] if [the sidewalk] has a curb ramp, if it's missing a curb ramp, if there's an obstacle, a surface problem, or if there's an area with no sidewalk. And they actually just added "crosswalk" and "pedestrian signals" as labels as well.

And let's say you labeled a surface problem, you can give it a rating. 1 is passable; 5 is not passable. You can also add a tag. For instance, [you can indicate] if the surface is bumpy, narrow, uneven, if there's ongoing construction, and more. Project sidewalk has ratings and tags for every different type of label that you can use.

Project Sidewalk also has a validation system built into the app that is able to validate whether [the labels] are correct or not. That way they get the most accurate data.

Orellana: So, the validation is a different person checking the same data?

Gio: It's a person and it's an AI that they have created as well.

Orellana: Yeah. We are also working with the University of Florida trying to calibrate an AI to construct some of the important features [in Mapillary]. We have a good data set here in Cuenca, and we are planning to do a new imagery collection using Mapillary. This should give us comprehensive imagery at least for the most central part of the city.

Gio: That sounds like the type of map that would show all the missing sidewalks, all the surface problems, and using all this data, hopefully someone could create a navigation tool. That's more towards the end goal. We're only here for seven weeks, so we're really focusing on getting this started and looking for ways to promote community engagement– really just getting the ball rolling on this whole application in Cuenca.

Orellana: Great. Fantastic.

Gachau: So, from your perspective, what do you think the city of Cuenca is doing well to address accessibility concerns?

Sam: If anything, haha.

Ms. Bustos: Haha, I don't know if I can answer that question.

Orellana: Honestly, not really anything. When they are trying to do something, like fulfilling the national norm on accessibility, they do it just because it's part of a checklist. Even in the new silos that they built last month, you can still find errors. There are pictures *[shows photos on his computer]*. The ramps that are there don't end at the same level of the street.

Ms. Bustos: Oh, I never told you something interesting about that. I used to work in construction, and we were building the bicycle lanes. My boss was an engineer, and he left the ramps, you know, not even with the road. [And I asked him] why? Why are you doing that? That doesn't work. There was also a guy, a wheelchair user, in the neighborhood and he said "this doesn't work." And I'm like, yeah, that guy is not going to be able to go out. But [my boss said] no, this meets the technical specifications. He was like, you know, the norm said it's okay.

Prof Orellana: *[shows some more pictures of inaccessible infrastructure on his computer]*

Sam: When you talked about the national accessibility standard, that was in your paper, right?

Ms. Bustos: Yes.

Sam: [In your paper] you said that none of the street segments fully complied with it. What is that standard? Like if we were to look it up? And do you feel like the standard isn't enough or it's just not being followed or enforced?

Orellana: In Spanish, it's called la Norma de Accessibilidad de Media Fisica. It's not enough, and it's not well used.

Ms. Bustos: Also, in my new research at the university, we're doing practically the same thing. First, we checked how the university was doing with the norm, and then we did the same route with wheelchair users and blind people. Most of the university does do what the norm says, but then when we audited the segments with people with disabilities, it was still very difficult for them. So, the norm really didn't matter, because it is not accommodating for all disabilities. Also, when we did the study in the city, we found that most of the new streets are not following the norm anyways.

Gio: Question. What kind of resources do you think are most available or most important for addressing these challenges? I know we're working with EMOV, but do you think there are other resources that could contribute to this as well?

Orellana: Uh, resources in the sense of data, software, tools, or just like actual, real-life resources?

Sam: I think all of the above; resources in-general. Not including the app that we're talking about. But, if you were to solve all the accessibility challenges in Cuenca, what would you do or need?

Orellana: Probably mainly education. Education of the specific people who are in charge of these kinds of projects. The whole spectrum from the mayor to the technicians that are working on the street, building ramps and so on. Because as Elisa was saying, the best you can get at this point is that we are just following the norm and that's all.

They are not solving these problems, and it's because they don't know. I think the fundamental first step for this is educating everyone. Then you can start to think about updating the norm and proposing things, but at least the people [would be more] aware of these issues.

Ms. Bustos: I think it's something we always comment on– if you are not working on this, you don't see the problem. If you don't work with disabled people, you think they don't exist. You think they don't have needs. Once you start working with them, you realize everything they need. As a simple example, when they made the bicycle lanes, [they weren't thinking of disabled people], but a lot of disabled people are using them. A lot of wheelchair users, specifically.

Ilana: In terms of education and informing the people who are in charge of these things, how would you go about that respectfully?

Orellana: Okay. I think there are [ways to do this] in Cuenca. Here, there is a good level of collaboration between the local government and academia. I think that's a good thing to start with. Also, there are some very good people in the local government at the technical level who

are pretty aware of these issues. But, they are kind of alone inside their own houses. I think they would need more support [to make change]. We can also work on public opinion by trying to work with the media.

I don't know if you guys know, but we have a living dashboard with the same information from the paper. It's an interactive dashboard where you can find all the data that is reported in the paper, and it's pretty useful because it shows you all the streets that were audited.

[Showing the dashboard on his laptop]. Yeah, those are the streets they've audited, and you can go and see each specific street to see the results of the evaluation and so on. We use this to show the media reporters and so on. It's public, and I will share the link now.

And we know that these kinds of things have to engage people and have to inform the discussion. I also wrote a couple of pieces to the national media about this subject, and we use social media to distribute and share these things as well. And we feel some resonance with the people- they are somewhat interested in this, but there's not enough discussion. However, if you promote the discussion, the people will engage.

Gio: Yeah. So that's one of the big things we want to do with Project Sidewalk. We were trying to figure out ways to get the people of Cuenca involved. In other cities, like in Mexico City, they engaged the people and hosted mapathons using Project Sidewalk. This made everyone more aware of the issues. Basically trying to get the community riled up and bring them together as a whole. That is one of the other big things I think Project Sidewalk could do for the city of Cuenca.

Orellana: So, we have a symposium every year. And last year we did a small exercise on street accessibility. It was pretty interesting. We got a lot of wheelchairs and took them to the symposium. The attendees used the wheelchairs to get from downtown to the university.

They were evaluating [the streets] using mapping tools. We also did exercises with blindfolds. And on the last day of the symposium, we took over a street and started to show how ramps could solve a lot of the problems, and other tactical things, like truncated domes. And it was pretty interesting. In just a couple of hours, we were able to transform a very difficult intersection.

We were also recording the reaction of the people who were around. And it was pretty interesting, I have to say. Just as an example, one of the participants really had problems trying to push the wheelchair on the sidewalk, and a guy stopped his car, blocking all the traffic, to help [the participants] reach the other side. There was also this informal street vendor that got really engaged with us. He started to talk to people and explain what was going on and how we need to solve these problems. So it was pretty interesting– demonstrating that people are willing to engage in the discussion.

Ms. Bustos: We also did an activity with reporters. There was a guy in a wheelchair, and he had to move from point A to point B, and he wanted to use the bus. He stopped the bus, and then the driver saw so many people around and said, okay, I'll take you. Then, the driver took half an hour to try to work the ramp on the bus, and it never worked.

Gio: We actually heard about that during our meeting with CONADIS. They said that some of the buses, even if they do have ramps, just don't work.

Ms. Bustos: Yes. And [the bus driver] said "it's the first time somebody asked me to use the ramp." So he didn't know how to do it.

Orellana: I think working with the reporters was also very important for a project we did with EMOV. We had– I think 15 reporters from the city– in a course about mobility. [It was called] sustainable and inclusive mobility, and it was pretty interesting. [We were able] to get some public voices advocating for this. I think that was also a very good exercise.

Gachau: Okay. So then our next question would be, were there previous attempts to improve Cuenca's accessibility in the past? If so, what were they, what were the outcomes, and were the attempts successful?

Orellana: Like real attempts, I'm not sure. The first thing was the national accessibility norm. But as you can see, it's not really working.

In our research, we found that the accessibility scores are usually higher in the newer streets. So, there has been some change. But, of course, the change has been much less than you should expect– especially taking into account that they are investing a lot of money.

And even when they are rebuilding the sidewalks, they are not doing it right. There were also some [initiatives] with the buses, but again, it's not enough.

Ms. Bustos: Yeah. They've implemented, on the entrance of public buildings, ramps.

Orellana: Yes. And probably, the implementations that are outside the public spaces are more successful at this point. Inside institutions, like schools and so on, could be a little bit better. But in the [outdoor] public space, these efforts are almost nonexistent.

I wanted to say something that we were discussing that other day. The first time I went to Europe, I was shocked at the amount of disabled people out on the streets. I was like, what? What happened in this country? Something is going to happen to me, because, you know, there's so many disabled people. I was super afraid that there was something wrong there.

And it really took me a while to realize that it was that way because people [with disabilities] can go out and about there. Yeah, and it's shocking. So of course, when disabled people here are trying to navigate the city, it really catches your attention because it’s not common.

Gio: Yeah, we have been here for three weeks already and I just saw my first person in a wheelchair.

Ms. Bustos: Yeah, you don't see a lot of [people in wheelchairs]. And they're mostly the young people who use wheelchairs. [The younger people] go out, but the ones who are older do not.

Gachau: Based on the brief overview we provided on Access Mapping and Project Sidewalk, do you think they are feasible and effective solutions that could be implemented in Cuenca?

Ms. Bustos: Yes, I think so.

Orellana: Of course.

Gio: I think the only problem that you were talking about was with Google Street View. That's why we're actually gonna go visit certain areas and compare and see what's changed. Because when we contacted John from Project Sidewalk, he said the Google Street View [of Cuenca] is from 2015. But, he said it’s not a huge problem, although there could be some things that have changed.

Orellana: There were a lot of changes in the last five years. We just gave up using Google Street View. That's why we decided to collect new images for the AI training. And so if I may give you some advice, it would be better to collect [pictures] with mobile phones or simple GoPro cameras. I think that will be better than using Google Street View at this point.

Okay, do you know about Mapillary? This is another street-level luxury platform, but it's open source. It's like an open street map. You can just do your own collection and upload there and you will get access to the whole data set. They also have an AI application on this platform and you can extract some information directly from there. And you can download it as a shape file and use a geographic information system. Definitely check it out.

[Pulls out laptop to demonstrate Mapillary]. I will show you. Sure.

It’s this map. So actually you can explore the data directly. They are extracting features from the imaginary. Let me get into it quickly. So these are all the images, and they are pretty old. We did this collection around 2015 or 2016– probably something like that. And it's not 360 degrees, it's just flat images.

You can access any image from the collection. So this is the locator. The interesting part here is that you can search all the data. For example, *[he searches for “poles”].* And then you will have

a map with all the poles, and you can download the data set directly *[the screen is showing a map of all the areas with poles].*

So, it would make sense to measure with mobile phones or GoPros or even a 360 camera and upload [the pictures] here. Then you would download the data. It's gonna be much easier. Of course, you will need to validate, probably doing in-field collection for some sample of the streets, just to be sure that you are getting what you are expecting.

But that would make much more sense. And once you validate that this methodology works, you can propose it to the municipality and say, okay, so this is the way things are.

These kinds of things are much more difficult to collect. But it probably will cover 60 or 70% of the data you need.

Gio: So maybe honestly using them *(GSV and Mapillary)* simultaneously would be beneficial?

Orellana: Yes, yeah.

Sam: We can talk to our contact from Project Sidewalk and see if instead of using Google Street View, we can use an application like that. Or maybe we can use them both?

Orellana: Yes, of course.

Ilana: So, if we were to end up creating an app for access mapping, how would you go about encouraging people to use it or promoting it to the public?

Orellana: Hmm *[turns to Ms. Bustos]*... You have more experience with this– apps?

Ms. Bustos: First of all, it would be incredible to have an app. I've been in contact with a lot of [people with disabilities], and they actually use apps on their phones, and they move around the city even if we don't see them. So, it would be really incredible to have something like that. And the part that you got me at was, we can use this information to tell the government, “we have a pretty accessible route here, but it has two obstacles. Please just fix those.” Or, “you have so many labels on this street: this is what you need to focus on.” Yeah. “We have an accessible route with one problem, you just fix that.”

Gio: *[Showing an example map from Project Sidewalk on his computer]*, it shows from white to red [which areas are most accessible].

Cambria: Yeah, they implemented this in New Jersey, and a group of girl scouts actually did most of the auditing. This just goes to show that it doesn't take academics or professionals to use this.

Gio: It's very easy to use the app too. It has a full tutorial, which shows you how to use it, and they do it by a mission. For example, for one mission, it might say to audit 500 meters of the street.

Orellana: It kind of makes it into a little chunk. I was going to say, regarding the apps, usually the problem is not in the technology, but in the community that is behind it. There are two things that you need to consider.

The first one is the community building behind the app. So the app is just the tool, it's not the end of the story. It's very important in the case of people with disability, that the [auditing] is easier to do. And for the purpose of [auditing], you can try to expand [engagement] beyond the people with disabilities– having more volunteers from other community groups. For instance, students from schools or universities. So, you can train a bunch of them, and they can start to train others, and so on. And the second part is that we've seen a lot of initiatives failing. You need to give people enough support to make sure they continue to use the app.

There's another problem. You can have a fantastic app, but it may not work [on all operating systems]. And if something is broken [with your app] and you can't fix it fast enough, it's very difficult for the people to [stay engaged]. So if, if you lose people, you lost them forever. It's very difficult to to get them back. So, this usually this means don't lose them [in the first place], which requires quite an effort for maintenance and support.

Gio: Yeah. *[Showing map on his computer]*. And so this is the other map I was talking about. It calculates problems per mile.

Orellana: Fantastic.

Gio: Yeah. In each region, you can see how many [obstacles there are]. Yeah. So that's just another map– besides the label map.

Also, some of the cities that have implemented Projects Sidewalk actually offer community service hours to students. And that's how they can collect data.

Orellana: Exactly, yeah. That's good.

Cambria: Again, do you think that's something that could be done at the University of Cuenca?

Orellana: Yes. We have these community service hours [that are required for students]. There are plenty of opportunities. But you might want [students from] architecture or probably social studies and so on. And you'd work with them to collect the data.

One piece of advice is with the students, always, always validate the data. There's this cross validation that we usually do, and it's proven to be very efficient. [You would say they need to

be] 90% accurate, and if not, you are not signing the papers or documents to approve them. Otherwise they don't care.

Gio: They actually have leaderboards for each city. And it shows who's the most accurate with the labeling that they've done. And so like, when someone signs in, you can keep track of if they're actually doing [the auditing correctly].

Orellana: Okay, nice.

Cambria: So we also want to know, do you know any other people that we can interview to get more insight and to learn more about ways to engage the community?

Orellana: Israel Idrovo. He works with us. He is the chair of the KALEIDOS research Group, and they work a lot with disabilities.

Ms. Bustos: And this guy who used to work in the municipality in social issues and working with people with disabilities. He also has a physical disability as a wheelchair user. He was always super engaged with these kinds of things. Juan Carlos.

Cambria: Yes, we're actually looking to interview people who have disabilities or mobility impairments to get their perspective.

Ms. Bustos: Oh, you can also talk to Juan Llerena. He worked at the university until October. I think he's really active. He's blind.

Cambria: We'll probably send an email after asking for their contacts. Those are all the questions that we had. So, unless you have any other questions or comments, I think that's it, thank you.

Jon Froelich

Interview Transcription
Jon Froehlich Interview
March 21st, 2023 from 4:00-5:00 p.m on Google Meets

Jon: Here is an obstacle, right? You see how that pole is in the middle of the sidewalk to some extent. Mm-hmm. And it appears as though there's not enough, um, width here. You're sort of three feet of width to allow a wheelchair user to go by. So you would put obstacles in the path and you would mark it on the severity scale. And it's one to five, where five is the worst, and I'm gonna put five. And then you hit the pole tag. So we have seven label types, and then each label has its own tag categories. And so we have roughly 45 different categories. You get very

rich data. It's all subjective and it's all crowdsourced. Right? And, um, and that's it, it doesn't require you to be in Cuenca because you're using Google street view.

Now, a lot of times our partners like to do some kind of onsite audit test, and so you're in Cuenca, you could do the virtual assessment and you could go out and do the onsite assessment, and maybe that would be a good idea, given that, I think we found that the Google Street view imagery is from 2015.

And then we have a set of different, like various analysis tools that you can use. Like we have a label map, which gives you a sense of a top-down view of where all the labels are. So again, this is in Lafayette dot and it's color coded. And so orange is surface problems, blue is obstacles. Um, pink is missing. Curve ramps, that's one. You can also go look at the gallery. And the gallery gives you kind of an image gallery of all the labels that's filterable and you can like, click. Oh, I just wanna see all the obstacles that are severity four and five. Um, you know, here, so here's another pole in the middle of the sidewalk, and so on and so forth.

This is very common in Mexico, actually. You see how this driveway is? The slope actually goes out into the sidewalk. Very, very, very common.

Gio: Very common here too. Yeah.

Jon: Yeah. Oh, so those are the kinds of things. Because every city is unique, but particularly when you're talking about Latin America or you know, South America or Central America, we might have to add new tags. We might have to add things that are culturally representative of the city of, you know, of Cuenca. Mm-hmm. So that's, so sometimes there is a bit of iteration. So I think your partner just joined.

Gio: Yeah, that's him. Hey Guilherme.

Guilherme: Hi Giovanni, sorry for being late.

Gio: Oh, no worries.

Cambria: You're fine, Guilherme

Jon: Oh, good. We're just doing little demos. So is that, I mean, I just wanted to make sure that now we're all on that kind of same page, and so like really the only thing we need from you is we need neighborhoods. And so like if we go up to this, let's see, again, we're in La Piedad. If I scroll down, you'll see that we've opened four neighborhoods, so I think, or maybe five. So you see these as regional. Those are critical. We need those regional boundaries because that's how partitions work. So when you join Project Sidewalk, we will distribute people, you know, virtually to these different areas. So we need these partitions, and usually the tighter the partition's the better. In other words, it's not good to have a hundred mile region of streets

because it's exhausting for people to do that. They don't feel like they're getting much movement and success. So instead, we like smaller partitions.

So if we, if we go into Mexico City, you'll see that they actually asked us to open up a massive neighborhood, which is about about a hundred miles, isn't it? Mikey? And I think they recently finished something like that, which is, uh, close to their university. And that's because they have partnered with the university, see down here.

So, you know, it all depends, but generally we recommend that you want to have smaller regional boundaries .

Guilherme: John, I have a question about it based on your email. You said about, uh, it should be bigger than five, 10 miles, but like the whole urban region of Cuenca is five to 10 miles, so we have much smaller neighborhoods. So I'm a little bit curious on what if you misspoke on something like.

Jon: No, no, no. I, well, first of all, I think it depends on whether or not you include, I mean, to me this is more than five to 10 miles. Just like looking at it, it depends on what, what you consider. It's just the downtown area or the surrounding areas. But at a glance, it looks like this would be maybe more than five to 10 miles.

Guilherme: No. Like this is the, where you have the mouse, this is the historical city center. Yeah. This is like two squares, no, two square kilometers. So it's 1.5 square miles. And the whole part that's surrounded by the yellow avenues, the upper one and the, the south one, which encloses the urban space. It's definitely much less than ten miles. I'll just now give it to you.

Jon: So, you know, in general smaller is better. Too small is not good. Right. But, so that generally, like I think between three to 10 miles is within reason. And these are street miles. It's not square kilometers, it's street miles within those areas.

Mikey: Yeah, I think, I think that's probably the biggest confusion is where we're sort of talking about the length, the, the sum of the lengths of the streets, uh, which is not something that's as easy to just calculate on.

Jon: So we have a Google collab notebook, Mike. Okay.

Mikey: Okay

Jon: So we could calculate that for you if you want. Regardless, you're still gonna have to give us regional boundaries that splice up Cuenca. Ideally, if you don't think that's a good idea, that's fair. If you just wanna get it done, and Cuenca is just one giant neighborhood, we can do that. But we found that it just lessens engagement a little bit because you don't feel like you're making as much profits. Does that make sense?

So, yeah. I was gonna pull up Taipei because like we just had these conversations with Taipei. And they wanted to do a smaller pilot. And look, they chose to be distributed around various parts of Taipei, and of course Taipei is one of the biggest cities in the world. But they wanted to have, like we, we did these smaller partitions because they had census tract and then they had like sub census, track Taipei. So we would largely defer to you guys, you guys know better than us.

Mikey: I'm also down to go over some of the um, like technical stuff that you were asking about in the beginning. John would you mind throwing up a label map and like removing the labels just for something to look at?

Jon: Okay, so which city?

Mikey: I don't care. Anything. I just wanted to see a road network basically. So you asked about GitHub at first, and so we just have one GitHub and that works for all the cities. There's just like a config file that we set certain things for each city pointing to in the chat right now. You know, it's mostly just putting the names of things to fill in for text and like we include certain tags for labels in different cities and don't include them in other cities. You know, like garage entrances are a big problem in Mexico as obstacles on the sidewalk because it's not so much of an issue in the United States.

Things like that. And so the way that we get this data set up is we get the road network, like you can see on John's screen. There are roads everywhere there. We get that from, from open street maps or, or some other. And you give us the neighborhood boundaries and we use that to partition the streets.We create the database and then we'll put that up on a server at the University of Washington and send you a link to the server basically. So really all we need is, like we said, is the neighborhood boundaries. And then we should be able to take everything from there. There shouldn't be too much like city specific instead of necessarily, and there's not like a separate repository for a code for each city.Cool. Let me know if you have any other questions about this stuff.

Jon: And I also just registered just because piping in the CS Washington servers, like a long url. I registered the friendly one, which is “Cuenca.propjectsidewalk.org” with the assumption that this would all work out together, but that won't work until we actually get the server up. So, so, you know, don't visit it cuz it won't work fine.

Guilherme: In this case John, I would like just to confirm the whole area that's within two greater avenues or, well, that's actually highways, the upper one and the lower one. It would mean like 10 square miles. This is almost the whole area space. We took much smaller and we have a subdivision from neighborhoods that we could share very easily with you.

Jon: That sounds good. Yeah. And sometimes we do this artificially. So like in Oradell, which is a suburb in New Jersey about like, I don't know, it's a commuter city for, for Manhattan. And like

this was artificial, actually, they didn't have these subdivisions. We just decided to create them to further subdivide Oradell. So I'll go down here cause it's easier to see. You see how we are. We made East Oradell or which doesn't actually really exist so much as we just made it. So there's East or Central Oradell. South Oradell. Yes. West Orde and then you can guess it is North Oradell, you know what I mean? So we can do the same thing in Cuenca if you want, just to further subdivide. But it sounds like you already have the neighborhoods and so you should just send those to us. The sooner you send us that data, the faster we can get your server online, because it sounds like your team is only there for like five more weeks or something.

Gio & Ilana: Probably six more weeks.

Guilherme: So what's the file, or the shapes, or which format of files would you like to receive?

Mikey: Shape files are fine. Kind of any typical GIS format. Probably shape files the most, you know, common. But you can feel free to send me something and, and ask if that works.

Jon: The other thing that we talked about before you came, um, how do you say your name? Guilherme?

Guilherme: Uh, yes. Guilherme.

Jon: Great pleasure meeting you is just, as you noticed, like most of the drive-through for Cuenca is 2015. And so we're gonna have people analyze the 2015 state of Cuenca, not the 2023 state of Cuenca.

And if that's a game-changer for you, you should let us know immediately. There's nothing we can do about that.

Guilherme: Yeah. That's a question that we discussed with the group, and I would like to spend some time on it. Most of the cvs, you usually do through Google Street View. Because yes, it is from 2015 what we were discussing with the group. They could maybe, uh, do a very small pilot of, I dunno, 10, 20 blocks. And we could actually go physically and check them to see if it's relevant or not. If it's 10% missing, it's reasonable. But if there has been so much change that it's not visible, if it's a 50% change of what we've seen, what they get as data. Maybe we could do a physical data gathering, and so on.

Jon: No, I'd love that. I think that's great because there's really two parts to this, right? One is we don't wanna waste anybody's time or effort. And so if the world has changed substantially since 2015, then it's not necessarily a great tool unless there's some reason to historically analyze Cuenca from the 2015 standpoint. Maybe there is, but I think that's really important.

The other side of it is just communicating app to, I don't know exactly how you want to use this data, but as soon as you say, oh yeah, the data timestamp is from 2015, people's ears will start to close, right? Because they're gonna immediately think that it's too old to be relevant.

And so you'll need to right away be ready with that argument and say, “I know what you're thinking. The data is seven or eight years old. But guess what? We did a field audit. We checked and there's like a hundred percent concordance or 90% or whatever it is.” Do you know what I mean? And so you're gonna need to be aware of that because otherwise people will just turn away from the data thinking that it's too old, you know, seven or eight years old.

Guilherme: Okay. I think at least in the part that you were thinking, that's the UNESCO Heritage City Center. It's actually hard to intervene because it's a heritage site.

Jon: So that's a good point.

Guilherme: Quite easily. So maybe at least for this part, yeah, it's mostly accurate on what you were. Little small changes that they know, that they happen, but they will not be, I think, big changes and they'll be very global.

Jon: So when we start talking about the design of that field audit, like, and I agree with you, we should just, you should do it maybe in a way that's distributed around a few different neighborhoods or something. It's easy to do the virtual audit, and it's harder to do the onsite audit. It'll take you more time, you'll get all sweaty.

But I would suggest that you go out and you actually will take pictures as well. And that way we can actually…you know, you should have notes and everything, but that way when you go back to the lab or the family room or wherever you are, dining room table, you can actually do a visual comparison as well. Be like, oh yeah, this looks different. Right? And so it's pretty easy and as long as you feel safe and comfortable doing so, going out there and just taking pictures, but we can talk more about that.

Guilherme: Do you have a template for on field data gathering?

Jon: I can show, I can share a paper with you, which is academically written, so maybe it's a little bit dense, but I can share that's exactly what we did. We basically swapped the same areas that we walked virtually in the tool and took pictures and then assessed them offline. So we could do visual comparisons.

But I think there's a lot of different ways to do that. Cause that actually creates, I think that was from bus stops actually. Mikey, now that I think. And you know what it was? It was curb ramps and bus stops. So those were very specific things, and that's why we were able to just take some pictures. You take pictures around the intersections and stuff like that, versus doing the entire street. Which would be more data, but I think we would just come up with an easy template. Maybe you would use the same kind of categories that we have. You would walk down the street, look or walk down the two sidewalks, use it, still take pictures whenever you saw something, as if that's a label and mark it. Relabel the image about what, like the tag would be. Something like that. But we can talk more about it.

Guilherme: Okay. I think it is this, but we can discuss later with the team. Yeah. Also just for you to know, we're the mobility public company of Cuenca and our goal is to try to assess low cost and high impact measures that we could try to improve accessibility in the city. The main problem is right now we do not have any data. We do not know where it is accessible or not. We do not know if someone with a wheelchair could go through the city or not. We do not know if there is enough width on the sidewalk or not. So a lot of things that do not allow us to access a general accessibility goal. And to provide public policy because we do not know where we stand right now.

Jon: Yeah. Well, I think we can help with that. It is a rapid subjective experience, right? Because people are virtually walking through, we're not gonna give you the perfect measurement of width. We can give you a subjective measurement of width saying, "oh, that looks too narrow, potentially for a wheelchair," but it's not gonna be the same as going out there and doing a measurement.

So it's it, it could be. You know, a lot of cities like to use it as a triage source. We can get the data relatively quickly. It's still a lot of work. The whole team in that dining room and everyone else will have to do a lot of mapping. But then if you could isolate the areas of like, severity three, four, and five and go out to those sites, right.And then do some additional measurement if you needed to.

The other side of it too is I don't know if you already work with a disability community in Cuenca, but it would be really great. If we could talk with them, you know, have them be part of this experience so they can flag things and be like, oh yeah, you know, over here this cobblestone actually isn't as bad as it is at the street crossings.

So I noticed there's quite a bit of cobblestone and brick, and especially for people with spinal cord injury, that that bumpiness can be very painful, you know, and uncomfortable. So there, there might be things that, you know, they want us to mark that we're not even aware of because we're not in Cuenca and I don't have experience with the city.

So if you have access to a disability group, it'd be super awesome to collaborate with them in some capacity.

Guilherme: We do have that access. Also, do you have experience? You always do it virtually because, um, on the first time that you talk, I thought that the most reasonable thing would be to do it physically walking down the streets. Or maybe the disability groups that would map their local environment or like maybe doing, doing something with the universities. But I always thought that maybe because we do not have the virtual data, that would be the first step. I think it's a good idea to match it. The virtual work is equivalent to the physical one.

Jon: I don't think anything really replaces doing that in-person audit, but the problem is it doesn't scale. It's very laborious and time consuming. It'll be very difficult for you to walk every

single city street in Cuenca, especially with somebody with a disability versus actually distributing this virtually. It's gonna be way faster. It's different types of data. I agree with that. Right. I agree that you're gonna get a different kind of perspective if you're walking down the street with somebody in a wheelchair and they can point out things. But it's something better than what you have. And, you know, so that's why I think it's like an ecosystem of things, right? Some of it is the onsite walkability audits that you might want to do anyway just to check the virtual audit tool, right? And we'll be able to supply a fair, large amount of data that I think that you can then use in a variety of ways to help prioritize, to bring it to the city council or whatever governing body is to try to prioritize different areas.For tourism or for access and equity, right?

Ilana: So another topic that came up a lot in our emails was community engagement. And we started talking about that a little bit, but earlier we had an interview with a professor at one of the universities in Cuenca, and they mentioned that there's like a big community service program with the students. So we were thinking we'd be able to utilize that to get a lot of volunteers to help us map, and also we were maybe considering using social media and incentives as ways to engage the community and maybe hosting an event for the public. But we were wondering if we could get some feedback on these community engagement ideas and maybe some inspiration for other things we can do.

Jon: Yeah, I think that's all great. We have experience doing all those things and they will work to various success. I think the key one is engaging the local university. What did you say? It was a college, university. So, we've done the same and ideally what would be nice is if they could have it as part of an assignment, right? And maybe this is an urban design class, maybe. Maybe it's a civics class, a social studies class where students are learning about urban design. Maybe they're learning about human rights, maybe they're learning about disability. And so there's some way for them to do a certain number of missions. It could be broken down in a variety of ways. We could say, okay, every student has to map one mile. Right. Or they have, every student has to do 200 labels, or sometimes we do missions, so every student has to do 10 missions. So I think that would be really, really great.

And then in addition to that, again, just having people that were working with that can convey that, that have the lived experience from the disability perspective, that can convey how Cuenca is to them. Like what are some of their biggest barriers. And are we properly capturing that in Project Sidewalk since that was originally designed in the us.

You know, for US infrastructure. But yeah. And then just to let you know, those things take time, right? You're gonna have to continue to communicate with that university professor. You're gonna have to help scaffold the experience. You know, we can supply what we've done in Mexico in terms of some of their assignment ideas.

And like you, you're gonna have to scaffold it. It doesn't just happen, right? It takes an Investment. Yeah,

Gachau: So along with our sponsor, we're trying to figure out how to engage and how are we gonna be able to fund Project Sidewalk? We were kind of wondering how Project Sidewalk has been funded in other cities in the past?

Jon: That's a good question. Well, so far it's mostly the national science foundation. Actually, you benefit from the US federal government. I mean, for us, we're trying to improve the world. I mean, first and foremost, truly. I mean, that's like the altruistic, idealistic perspective. Mikey and I are attracted to trying to improve urban environments for people with disabilities and safety, just generally across the board.

In cases like this, we're learning a lot. Like we wanna grow in Latin America. So I think there's value in us learning about how to better deploy tools in Latin America. Because I'm not from there. Mikey's not from there. But we have an active collaboration in Mexico, as you've seen. We would love to expand into South America. This is an opportunity for us to do that. And in return, what we would hope is we could learn from you. You know, like Guilherme, there might be, I don't know if there's Spanish language differences, because all our Spanish translations are Mexican. And, you know, maybe you don't agree with that, so we might have to actually tweak that file as well. Right. And so up here we have Chinese, right? Dutch and Spanish. It's a strange mixture of languages, but maybe we have Spanish and then we also have Spanish, Ecuadorian Spanish or something. If there are things that just don't seem to make sense of a Spanish version of it, and I'm not fluent enough, here's Spanish, I'm not fluent enough to know whether or not there's weird language things.

Mikey: And I wouldn't be surprised if there are. Even core things like I think even just like the word first sidewalk might be different. So there might be some core things that are important.

Jon: What is it like banqueta or something?

Guilherme: In Colombia and a lot of other places, here we call it “banqueta” but I don't know why each country calls sidewalks one name. I'm actually from Brazil, so I speak Portuguese. I've been working here for four years now, so I got to think a little bit about the translation. So I'm not the best person to manage translations, but of course I do know it very well. But the regional difference, I know that there are, but I should talk to someone else

Jon: That's the thing is like if we do want to have this as a community outreach thing, right. Here with the community we wanna make sure that the language is good. Because if it's not, it makes it feel like we don't care, but we do care. Right. So that's the kind of thing that we wanna signal and it sort of gets right. But I'm not a good person for it. Cause I, I don't speak Spanish and I don't speak Portuguese, so I couldn't go to Brazil or Portugal.

Guilherme: If you want to go to Brazil then sure. Another question that we have, if we would like to scale it with resources.

Jon: Yeah, that's a great question. Like he's nodding. Because this comes up, it's a really important question. Like it, anything in life, there's a trade off between the quality and speed. And I think what's really important is that you have to spend some amount of your Map-a-thon. I know people are excited to get going and you, you want to, you want to have them get going because they're excited to do stuff.

On the other hand, you have to train them enough where they're not making mistakes because our tool will start to mark you as not good if you're not doing well. And like that both comes from validations. We have a validation pipeline as well as some heuristics that we've learned over time about what makes a good labeler and not, and so it's really important.

We've been putting effort into this, like there's some dos and do nots that you should start with. You share that out and you try to make it engaging and then you just let them run. Maybe you do a check-in at some point. So that's kind of a long answer. The short answer is it's roughly walking speed virtually.So it's roughly like between two to three miles an hour to audit. So it's fast, but it's not that fast. It's not like we're running through the system here. Here's the thing, you've gotta be able to look at both sides of the road, right? You're kind of zooming in, you're kind of having these considerations. You're like, "okay, well, is this pole actually an obstacle? I kind of think it is." And so, you know, you, and you've gotta mark an assessment. Well, it doesn't, it looks like there's maybe some space around it, right? And then you gotta take another step, and then when you do there's a whole nother set of things to evaluate, right?

And so it's kind of a time consuming process, and you want people to do it diligently. And if you pressure them to go too fast, you're not gonna get good quality data. You know what I mean?

Mikey: So, yeah, two, two miles an hour I think is a reasonable guess. I think you'll also have a better idea once we, I guess I haven't looked at Google Street View and clicked up very much, but you know, the more stuff there is to label, the longer it takes. You know, if all the sidewalks are totally broken up and, and cracked, you're gonna spend a lot more time adding these servers, problem labels everywhere. And so certain, certain neighborhoods will take, certain areas will take longer to live than others, but yeah, something around two miles an hour I think is, is okay.

Jon: Yeah. Like one thing that they have a lot of is bricks. And it was the same thing in Amsterdam, and Amsterdam essentially told us, look, we know we have a ton of brick sidewalks. Don't have people label brick sidewalks anymore. It's just wasting everyone's time. We assume that they're bricks, you know what I mean?

Versus the other way around in the US It's good to have that because again, it creates that kind of bumpiness.

Gio: Go into number eight.

Gachau: Eight, okay. 10.

Cambria: So we know that Project Sidewalk can be used as a navigating tool, but are there any other benefits that we can use Project Sidewalk for such as analyzing data and things?

Jon: Yeah, I would actually say it's not necessarily good for navigation at this point because remember, you have to think about the data coming from 2015, and you know, that's yet to be seen about whether or not people could actively use it for routing on the other, which is what I assume you mean by navigation.

On the other hand, what we mostly have been doing is urban analytics for cities. Which is the process of really triaging and understanding what does my city look like from an urban accessibility perspective or pedestrian accessibility perspective. Where are the worst? Where are they not? I think I sent you the Oradell presentation, right?

Gio: Yeah.

Jon: So that gives you a really good sense, like I don't think we ever use the word outing our navigation, right? Instead, it's totally framed around analysis and sort of, you know, urban informatics or urban analysis and, and somebody could build a tool on top of it, around routing, but we haven't really done that with our data.

Does that make sense? So, and you guys have to decide, is that still worthwhile? Right. So the cities that we've partnered with are kind of like you. They don't have a good sense of the urban accessibility or the pedestrian accessibility of their sidewalk infrastructure. And so they're just interested in getting that assessment and then doing various analytics on top of it.

Guilherme: I think just for this, it'll be worth it. Just if we can access the general accessibility, it's a worthy effort.

Jon: And I'm not saying you couldn't build a navigation tool on top of the data, especially if you're confident that it's relatively, you know, good and reflective of the state of the urban environment now. But we just haven't put any time into developing a navigation tool like that ourselves.

Gio: But in theory, someone else could like, use the data and then like to build it. Because I've seen that that was done in I saw that it was done in Seattle with, uh, access map.

Jon: It was done in DC. The Seattle dataset map is not my project, and that uses professionally collected data that leverages the fact that Seattle has professionally gathered curb, ramp and sidewalk network data. But that generally doesn't exist. So Seattle, which is where I live, is unique in that capacity. That's not using open data that's using, I mean, it actually actually happens to be open data.That's just because the city has decided to publish it.

But tool, but you're right that tools like Access Map could be used with the data that we're collecting.

Gachau: Onto our next question. So earlier today we actually spoke to a professor at the University of Cuenca and he had talked about Mapillary, which is a website where there's already some data stored on Cuenca's accessibility. And so we were wondering if it would be possible for us to use Mapillary instead of Google Street View, or if we could use the two in conjunction with each other. We can kind of show you what it looks like as well.

Jon: Yeah, I mean we're totally aware of Mapillary, which Metabot a couple years ago. So it's owned by yet another big company, so it sort of choose your evil. Mapillary is a great data set. Project Sidewalk does not work with Mapillary and we don't have the engineering resources to make it work with Mapillary.

At the same time, if you just wanted to virtually audit Quinco, you could do so with an Excel spread. Right? A Google sheet, you could in map area and you could take a step and look around in map area and then mark off stuff in your Google, in your spreadsheet, and that there are a lot of scientists, urban scientists that do that kind of assessment project sidewalk just makes it easier to do that.

Does that make sense to you? You could use Mapillary and a spreadsheet or just a notepad and mark down what you see. Okay. There's a lot of people that are like, you know, in disability studies or social scientists that do studies of cities.

Gio: So maybe that would be good in areas where we find that the Google Street view is outdated, then we can go to that format and then go there in person and use that method to audit the street.

Jon: Totally agree.

Gachau: That was it for questions for us. Do we have any other questions?

Cambria: I mean, would it make more sense to use Google Street View and a spreadsheet to audit the maps before Project Sidewalk? Because Project Sidewalk would use Google Street View, not Mapillary.

Gio: Oh, well, yeah, that's what I'm talking about. Like what we find if it doesn't correlate to like what's in real life, then we would use the Mapillary method to audit that. Let's say if they actually built a sidewalk and Google Street View doesn't show the sidewalk, then we would use Mapware to audit that. Yeah, that's what I was saying.

Jon: Yeah, so I totally agree with Giovanni. So I think Giovanni's got it. You would use Project Sidewalk, that's your substrate. So that's your initial baseline. You gather as much data as you

can that way, but we know it's all from 2015. And then you could compliment that with the people audits in some cases, as well as with the Mapillary if Mapillary has newer data.

And then there would be a question of how do you get that data back into Project Sidewalk? And we should have that conversation at some later point. Don't need that data back into Project Sidewalk, but I think we could build something for you.

Mikey: Seeing Mapillary in Cuenca and it seems like 2017, 2018. It's a little bit 2015 too, but it's from a little bit I'm looking at.

Jon: But it's great, I mean, every question you. To me, it's really important. It shows me that you've really thought this through, they're great questions. We've certainly heard them before, which is why we have responses for them, but I really appreciate that.

And our email chain as well. Like Mikey and I are making an investment essentially if, if we decide to go to Cuenca, it's both ways. Right. There has to be some mutual value clear. Yeah. And we just need to make sure that we're all aligned on what's going on here before we make this investment.

Cause it's Mikey's time and my time. Which thankfully is paid by the National Science Foundation and the University of Washington at this point. This is gonna be free. But it will come down to community engagement and your Map-a-thon labor. That's what's gonna come down to is how good are you at actually doing the task.

Guilherme: John, just so that we are sure that we will not be wasting anyone's time. Is it an acceptable agreement for you that we could just try to do this pilot and try to check in some neighborhoods if the street view that we have could be outed in a successful way?

And before you doing a big time or resource investment or just for the start, you would have to go all the way in expecting us to fulfill our part?

Jon: No, I think that's fine. We wouldneed those neighborhood boundaries and we actually have a new tool that's not published yet where you could build your own route audit routes. And so you could select the streets that you wanted to audit. And so you could decide as a team, okay, we're gonna go, we wanna audit here, we wanna audit here, we wanna audit here, and then we're gonna go do the field site visits as well in the double check.

So I think we have a, and that it would be cool to do that. So I think there's enough value in that experience and for us to like talk about that in our research papers that we, I think Mikey, maybe Mikey and I need to talk about this offline, but that would be my first reaction, Mikey, that like, this is valuable in that we can demonstrate utility of the data even if it's eight years old.

Mikey: Yeah. I think I, I do think that the majority of at least like my time investment comes at the very beginning no matter what. If that's a specific question, but I think that is worth it for us.

Like I think that we're, we're down to, to set something up and then even if it doesn't work out, we can, we can back out and that's, that's okay.

Jon: Learn through failure

Guilherme: I'll be totally honest, honest with you in this regard. I'm on the public side of this project and I completely believe that we should invest our time and our resources on it. And also from the thing after the first thing goes out, I would like to keep investing in it and scaling it.

But last month we lost in the regional elections. So the mayor will be changed on May 15th, and this may represent changes in people. So there is always the risk of people changing and not prioritizing or completing.

Jon: Does that include you?

Guilherme: This would include me. I am in a removable position inside the organization that a mayor would have the right to substitute. So it's not a guaranteed thing. But I always say, I think we could try to leave a legacy. A roadmap, who doesn't want to improve the lives of citizens with disabilities. So I think there is always a strong argument. I cannot promise, but I would like to be completely clear of where we are standing.

Jon: Yeah, okay. Yeah, no, thanks for your honesty. I think we're aligned. I think that you identify where you do those little test pilots and I don't think you need to do that much. You know, maybe it's a total of 1.5 kilometers or 2 kilometers spread around a few different parts of Cuenca, which I understand is small, but there will probably be differences and then really utilize this team before they have to leave.

Guilherme: This week then I'll gather the check files from the municipality. They have this kind of files and we can discuss with the team, which will be our proposal of action. And we will get back to you as soon as we have a proposal.

Jon: Okay. Sounds good. And then on our end probably Mikey will just email Jason. Start getting just the heads up that another server is coming online. Yeah. Um, cool, cool. Other things. Cool, any other things?

Cambria: How long do you think it will take for it to become online? Like is it something like we could, while we're here, go into Project Sidewalk and start auditing or–

Jon: That would be the whole, like, for sure. Yeah. Like, I think part of the pilot experience that Guilherme was, was talking about. Yeah, y'all, we train you up and you have some good understanding of how to do this assessment. You do the virtual audits, and maybe we have two of you independently walk through the same routes, so don't look over each other's shoulders.

Right. And you do two independent people do the same routes, and then you go out and you do the field audit. And I think you should do that while you're in Cuenca. And then once we have a fairly good feeling, if it goes well, then when you leave and you go back to WPI, then you can continue to do the virtual audits.

What you won't be able to do though, is really the community outreach part. So that would come back to Guilherme and whether or not you were able to lead on that.

Gio: And also the university people that we are interviewing or that we will interview and other people from the disability groups, like just to get them to keep it up once we leave, like, yeah, totally.

Jon: Good point. Good point. Yeah. Thank you.

Cambria: Especially if we can talk to professors. Having this be an assignment for students like year after year, then this could be built upon.

Mikey: Yep. And I think that, I don't know, I think a reasonable timeline is something like a week to get it set up and, and have the, the server running. I think in the meantime you could start, you know, like setting up your checklist for how you're gonna do the infield audits. Maybe you could even start doing the in-person audits. They don't have to happen after the project sidewalk server. Okay. Um, yeah, I think somewhere around a week makes sense. It sort of depends on our IT people and how busy they are. But probably around a week sounds right.

Jon: Yeah, I mean, you might wanna do the field audit after. I mean, I agree with that. Like if you're just trying to be efficient, but you're gonna have to come up with, like, when you look, when you do the virtual audits, you're gonna learn about those tags, right?

We have seven label tags. We have curb ramps, missing curb ramps, surface problems, obstacles and paths, pedestrian signals and cross. Plus an other. And if you use our tool, you're gonna get a better sense of what all that means.

Mikey: Sorry, I left out the part where, where I think to make that protocol, you would want to do some auditing using Project Sidewalk and like knock it out or something. Just like the use of the tool. Know that you're actually gonna have similar data from there.

Jon: And then, you know, related to that is just tagged. You know? Are there things that you think are particularly unique about Cuenca that we should try to encode?

Gio: Okay. We can do that.

Jon: Okay, sweet.

Mikey: Just want to make that super clear. Like we can add under the obstacle label type, there's like a tag for pole and fire hydrant and like we can add and subtract those really easily.

Jon: Park spot, park scooter, like, in Europe you're seeing park scooters, the kind of motorbikes to park quickly on the sidewalks and then become barriers, you know, so we added that.

Cambria: How does Project Sidewalk take into account major infrastructure differences from GSV?

Jon: The people who are auditing will be familiar with Cuenca. So they should be able to recognize if there is a major infrastructure difference and we can then omit those areas on GSV. It's easier to account for them later in post-hoc analysis.

Cambria: How specifically does Project Sidewalk help municipalities or the community? Can you give us some examples?

Jon: In Newburg, Oregon, the community used Project Sidewalk to audit. And this led to some new policy changes, some new subsidies for people to make sidewalk repairs. I don't know how successful those things were, but I do know that our data and our tool was used to help for advocacy. So that's one.
Another one is recently, more recently in Oradell, New Jersey. This is a suburb outside of New York City. I'll tell you, it has been such an amazing collaboration as Mikey can attest. Like we are really enjoying working with you all, but we're still early on in this collaboration. But with Bergen County, we've worked for like a year with Hackensack Medical School. There's a local national, multiple sclerosis that we've worked with there. And then with the Girl Scouts of Bergen County, mapping out Oradell. It was successful with the service learning educational piece for these Girl Scouts. But also they just presented to the city council. The mayor unfortunately fell sick, so we have not been able to [wifi cut out]...continue our advocacy efforts, and then crickets, because it takes a lot of political oil, resources, and money to make change. And so this is the thing, it does require continued advocacy. So we have some in Oradell and I'm hopeful that it'll result in something positive, but we'll have to see.

And then I said I would mention some sort of unsuccessful cases. So we worked with an open in Columbus, Ohio, which is actually a very big city. We worked with a sort of an open science group there called Open Columbus, which has a variety of initiatives around transit and open data. And that was pretty successful for a while, but we didn't have government involvement. And so as a result, we have fairly good data there, but it's not, I don't think Mikey has it been used for anything?

Mikey: I don't think so. No.

Jon: Yeah. So at some point you have to, even though this is sort of an open community effort, what we would call bottom up advocacy, you need to get the government involved because ultimately they're the ones who are gonna impact change.

Cambria: We're lucky that our sponsor is from EMOV, which is like the public office of Mobility, Transit, and Transportation for the city.

Jon: Yeah. It's totally necessary. And, in the US we have the ADA obviously, which is built around equitable infrastructure, but yet cities still don't have equitable infrastructure and my colleague, Gil High Eisenberg at the University of Illinois, Chicago has shown that very few cities are prepared to transition and renovate their cities for access. So it's just, there's just not a lot of money currently for cities to do this, and instead they invested in other things like light rail and buses and mass transit.

Cambria: One big issue here in Cuenca is people don't really see the accessibility issues. So what our sponsor wants to use with this data is build awareness for the people here. And there's also a big issue with people who, the ones who actually build like the curb ramps and stuff don't understand that, one big problem here is that the level of the ramp is not the same level as the sidewalk. So our sponsor wants to build awareness on things like that.

Jon: I agree. I mean, we run into the same thing here in the US. The cities will contract out with professional engineering and contractors. They'll come in and they'll build their curb ramps. But there won't be compliance. They'll be too steep or, or they'll be pointed diagonally into the roadway; cause they're not necessarily trained, these engineering corporations on making ADA accessible ramps and other things, so it’s complicated. Although life is complicated. But the data itself and advocacy groups bring the city into a new place, right? And it gives them something concrete to say, oh, well, we should focus on these areas, just like your field audit right? Like, these are the major areas that require attention.

Okay. All right. Are we good? Guilherme, are you good?

Guilherme: Yep, I'm good.

Gio: Yeah, we're good here too. We'll get to work on that and get back to you with all that stuff.

Cambria: And we'll probably schedule another meeting,

Jon: Awesome. Yeah, it was a joy to meet you. I think this WPI program sounds amazing. So kudos to you all for being part of it, and I hope you're learning a lot and we hope to be part of that learning.

Gio: Yeah. No, thank you.

Gachau: Thank you so much. Taking the time to talk to us.

Ilana: Thank you

Professor Carla Hermida

Interview Transcription
Professor Carla Hermida
March 23rd, 2023 from 4:00-5:00 p.m. at the University of Azuay

Cambria: Hello. We are a group of college students from Worcester Polytechnic Institute in Massachusetts, USA working with EMOV EP or Cuenca's Public Office of Mobility, Transit and Transport to assist in their efforts to increase street level accessibility in Cuenca by implementing Project Sidewalk and determining methods to engage the community. Project Sidewalk is a platform that allows users to virtually audit streets through Google Street View. And users virtually travel along streets in the city to label accessible or inaccessible aspects of the street in order to create a visual representation of inaccessible areas of the city. So the effectiveness of the software relies on the ability of the community to engage and audit the streets. So we would like to ask you a series of interview questions regarding constraints with implementing Project Sidewalk in Cuenca and methods to engage the community.

Sam: The interview will take approximately 60 minutes, but time may vary depending on the flow of conversation. There's no anticipated risks to you and no direct benefits to you for participating in this interview. Your responses will help us better understand how we can best involve the community in the completion of this project.

Gio: The interview will be audio recorded. Of course, you do have the right to decline at any time. Your name and job title may be associated with your responses in our project report, but you also have the option to remain anonymous. Your participation in this interview is completely voluntary and you have the right not to respond to any interview question. You should inform the interviewer (us) If you would like to end the conversation at any time.

Gachau: The goal of this interview is to gain expert insight about implementing Project Sidewalk and Methods to engage the community to audit streets with the software.

Cambria: So to start, we just wanna know your job title and experience with infrastructure and/or accessibility in Cuenca.

Carla: I am a teacher and a researcher in the School of Architecture of the University of Azuay. That's what I do normally, but, during these years, I am the graduate director of the university. And, um, well, my experience with accessibility mostly has to do with research. I've been doing some research during the last maybe 10 years related to urban mobility, more than accessibility, but, Obviously accessibility is always a transversal act. I did my masters in the States and I used to speak very well, but my English is fine. I also had the opportunity to work in the municipality. So I also have this view of all the constraints and difficulties that arise from when you want to implement a project. So those are my two areas. I worked in the municipality until

the year 2012. And well after that I've been totally related to the university doing research and teaching.

Cambria: What kind of work did you do in the municipality? Like specifically?

Carla: The first part, I was the planning director. But then I was asked to move to mobility. It was called the mobility secretary. Now, I think that position disappeared. But, we were the ones that planned and conducted the studies for the tram, for example.

Ilana: So are you from Cuenca originally, or how long have you lived in the area?

Cuenca: No, originally I was born in Quito. I lived many years in Quito, and I came to Cuenca when I was 18. I came to study architecture here and then I got married and I have lived here more than I have lived over there.

Ilana: So you're very familiar with the area?

Carla: Yes. Familiar? Yes. Yes.

Ilana: We're just starting to get familiar with it.

Carla: I've lived more than half of my life here.

Gachau: And so from your point of view, what is the city of Cuenca currently doing well to address accessibility concerns?

Carla: Okay. Well, depends if you compare it with what city, I mean if you compare Cuenca to other cities, in Ecuador, I think we're doing well. We have a lot of things going on in mobility, starting with a tram and a public bicycle. And we have the card for using the pass. Which is, that doesn't happen very often in other cities in Ecuador. I think we have quiet, good, cycle lanes. Not all of them are that safe, but we have many. I'm able to come by bicycle and I live very far and I can come all the way for a bicycle lane. But, I think that our main, our main difficulty or our main problem is with pedestrians. So downtown, for example, we have very narrow sidewalks where not even one person can walk and even less if the person has to use wheelchairs or, the topic that I, in research a lot with these the care mobility.
What I was saying is that I think that the principal problem here is for pedestrians. The sidewalks downtown are narrow and, uh, not downtown, wider, but we do have a lot of obstacles. Most of those obstacles are set by the public institutions, for example, the posts. Or the signaling and so it's kind of, you have a wide sidewalk, but you cannot cross. One of the topics that I'm interested in researching is the mobility of care or the care mobility. I don't know how you say it in English. Well, which has to do with the people that take care of others. For example, mostly mothers. But there are also fathers, but mostly mothers or, or people that take care of people with some kind of disability. Mostly are women, the ones that take care. So it has a gender issue there. But, we have detected, for example, that when a mother or a father, but

mostly a mother comes with a car with a kid to school, has more difficulties with our sidewalks. And somebody that is not taking care of a child or of an old person or a person with disabilities.

Gachau: In what ways could the city improve its approach to accessibility?

Carla: That's a big question. Yeah, because, uh, I think that the theory is, it's clear for all the people in the municipality, technicians, politicians, I think we all have very clear what has to be done. I don't think that any authority or professional in the municipality or person doubts nowadays the necessity of having a shared road where you can have a comfortable and safe sidewalk and comfortable and safe cycleway and a comfortable and safe place for public transport and a comfortable and safe road for the vehicle. I think we all know that all the majors that we're now posting for being majors, I think they all know that and all people in the municipality and all that. So the problem I don't think is the theory, I think the theory is quite clear. There are some issues there that do not have to do with the technical part according to my point of view. And what I have explored has to do with other issues. For example, with politics I would say first of all with politics, and that has also two things. One of them is continuity. The municipality, the mayor, and all his team will leave in May. So everything that Guilherme has done will not be continued. And this is an example, but all the people that are working will not be continued. So if, if there was something going on for accessibility, it'll not be continued. And the same happened before. For example, I remember, I think it was six or seven years ago. There was this big project that was done, for making all the roads that go to the tram in downtown, making them with better sections for walking.There were these two big consultancies that had everything prepared and ready for downtown. But that major did not continue. That's the one thing, uh, related with politics. And the other thing related to politics is obviously what I call the el capital Political, the political capital. Which means that the authorities sometimes are not able to do things because they lose their political capital. I don't know if you have talked with Guilherme, but for example, building the cycle lane that goes very close to our university almost brought the major down. I mean, it was a big, big, big, big, big fight and a big thing that if I was major, I would have said, okay, no motorcycles. I don't wanna go there again. Sso that's the other issue. Politically,the authorities have to have to deal with a lot of forces. So sometimes they are clear about what has to be done technically. But it's hard to be done, politically. So I think that's, I don't think the technical part is the, the biggest problem.

Gio: What kind of resources are, do you think are most available or most important for addressing these types of challenges In the city?

Carla: Maybe I would say that for these challenges that I'm talking about right now, one would be social participation, and the other one. I would say it's communication. How you communicate things nowadays with all the networks and all the social media and all the things going on. It's very hard to deal with, I mean very good communication work has to be done in order for things to happen and obviously social participation, but it's not always easy social participation. I mean, if you for example, I was telling you about importance for pedestrians, but if you want to make a sidewalk wider, you have to agree with, you have to make social

participation all with, all also with the neighbors and the, so it's not easy, I think even if it's not easy, it has to be done.

Gio: Were there previous attempts to improve Cuenca's accessibility? And then if so what were they? What was the outcome or were the attempts successful?

Carla: Yes. If you can read Spanish, I wrote a little book, based on my PhD dissertation, and there, I tell the story a little bit of how it developed from it all started I would say in 1999, because in that year, the municipality acquired the the faculty of planning, the topics related with mobility and transport. Before 1999, all of that was in the government, in the national government. So from Quito, they said, oh, Cuenca will have this number of buses. Oh, Cuenca will have this money for the sidewalks. It was not the municipality here. So it was only until 1999 that we started planning our own mobility and transportation. And I think that from that year on there have been many improvements. I mean, many improvements. We still have a lot to do, but there has been, for example, public transport. The buses that we had before were very old and very bad. And now we have these rules that they have to be new and they have to go through inspections every year. And we had, for example, the public bicycle, there are many, many, many little things. The things that I still think, as I told you at the beginning, is that for pedestrians, I still think that there has to be a lot to do.

Cambria: So going off of that, what do you think are the first necessary steps to make progress?

Carla: I don't know if there are steps. I would have to rethink. I'm trying to think. Okay. In May, we're gonna have a new major. Mm-hmm. So he sits in his chair. And what is the first thing that he should do to improve accessibility? Well, I would start maybe thinking of planning some laws for the city, like for example, I'm going to think only pedestrians right now so that I can focus. Here we have a lot of the entrances for the garage. And if you are in a wheelchair or the car with of a child, or if you are an old person… and so maybe start thinking about possible reforms of the law to avoid these things. Like the entrances to the garage and also maybe avoiding we have something that I used to think it was perfect and that makes the city clean, but. For the blind people, it's terrible, the things for the garbage. So I used to think that that's perfect because the dogs don't get in that and our city is so clean and so wonderful. But obviously for the blind people, that is terrible. And nowadays it's also If we're not helping blind people because we are blind when we get older.That could be done in like maybe controlling and reforming the laws that exist nowaday. But we do have a lot of laws that maybe could be applied. Sometimes the law is there. But we don't know it or it's not applied enough. Well that could be one thing, like not expensive. But talking of projects that require resources, economic resources will definitely improve sidewalks. I mean, and I hope Guilherme doesn't get mad with what I'm going to say, but we have invested millions for cars. We have invested a lot of money in when cars go down the highways over bridges. This year we had like one big one and I always say that we invest too much in motorized mobility. So if we could take 10% of that money and improve sidewalks that could go a long way, but politically it is not easy. That's why I said that's one of the biggest problems because the people that walk, we are not demanding.

And we are not tweeting about it. But the people in cars, yes. Oh, I understand that politically it's hard.

Gio: So that's interesting when you say that, because Project Sidewalk, I think the goal of it is to get the community engaged. I can show you how it works. That's the product sidewalk. And basically you're gonna have these different tags that people can go on Google Street view and audit the streets with. You have curb ramps if it's missing a curb ramp, if there's an obstacle in the path. If there's a surface problem. No sidewalk. And then even they added these two ones recently, crosswalk and pedestrian signal. And so this is the interface of how it works. Let's say you're able to like control it how you would in Google Street view. And you can, uh, click on one of the labels, place it on wherever you see the problem is give it a scale of one to five. Either one is passable or five is not passable. And then you can even give it tags for every certain label. Like let's say If it's a pole or if it's a tree in the way. They have like very different tags. And when we talked to them, they also said that they can add or remove tags very easily. So for Cuenca there could be a new tag for a driveway because that's a big problem here, but not in the United States where this was implemented. And so the whole goal of this thing is to be able to have sections and able to have labels. And so you create a map like this, it shows how many of the problems there are, and since this is open source data, anyone can access it. It's free as well and very easy to use. And so I think the thing for Cuenca especially is for the people to realize how much of an issue it is. There's another map that also shows the severity of accessibility in certain neighborhoods since that's how it works with the demarcations. That's how it works. There's missions for the people to do. That way they don't feel like they're not getting enough work done. So it's cut up into small little neighborhoods and for each neighborhood there's a severity scale from white to red. And then they'll create a map, sort of like this. This is in Seattle. Um, it has to load real quick. And so you see it goes from low to high, and for each neighborhood it shows you how well it is, how many problems, like how many missing sidewalks, missing ramps, surface problems. Obstacles. And so it's kind of just like to get the people to open their eyes and like really see what the problem is and kind of make that push for change.

Cambria: It can also help the government focus on certain areas.

Carla: It's very good. Have you seen, we have something similar to that in the Llacta lab, but it's not so specific. You just know the sustainable index here is for walking and this much for cycling and this much for public health and that's why I think this one is more specific.

Gio: That's why I think combining this with that as well would provide enough data for the government of Cuenca to be able to utilize, or send out workers to go fix those areas or just educate.
Do you have any ideas on how to get students at this university specifically to help out with Cuenca and Project Sidewalk? There's been a few ways to give assignments on this to students in a class like urban development maybe, or social science, or even just giving it out as community service.

Carla: So, well, I see three ways that we could connect. It also depends on when this starts and things like that. But one of them is obviously in our urban studies classes. Definitely we could the students do this as part of their assignments.

Gio: They can sign in, they can also track how many miles they are-

Carla: And we can also give them as an assignment, it will be interesting. It will be fun. And all the teachers of our area will be happy to do that. That's one way which counts on that. The other way is a little bit more serious, which will be with you. Which means EMOV and University of Azuay sign an agreement, which means a project in which the students relate with society. Something like that. And there all the students that want to earn a credit, for example, can do this for a certain number of hours. Our students have to do, I think it's 64 hours of community service. If this is led by this agreement, the students sign and they can do that. And the students have to do 64 hours of that before they graduate. In this case, this can be done by students of other areas, like we could have students in other areas sign up.

Gio: It doesn't even have to be just in Cuenca. I could be in the United States and I could audit Cuenca. In the software, it doesn't even have to be just Cuenca.

Carla: They, they have to work 64 hours and they can do whatever it has to be done. Yeah. And that's the second thing. And the last thing, which is more for a longer term is the research. Like final graduation projects, like thesis of the students, The thing that they give before they graduate, like the thesis. That's more for a long term, but it would be interesting for some students. Take this and start analyzing what happened in this neighborhood. Is this neighborhood poor, rich? Does this data have something to do with an, a social economic level? Or does it have to do more with how many women live there or does it have to do with their kids? That's more exploring the information so that it's not only descriptive, but also gives us more feedback.

Cambria: I know you asked about like, you don't know when this would like to start up, but actually, we've been talking to the programmers at Project Sidewalk and they said once they receive…

Guilherme: The boundaries from the neighborhoods that place aside the limits that we want to enclose, It should be enough for them to draw. And we could already start.

Carla: Well, what we could do, if this is like, let's say in a couple of weeks, we could do a meeting with all the urban studies teachers because what it will take for the students, I guess is if we divide them in some blocks, um, maybe 2, 3, 4 days, maybe a week. So I think they will all be excited. We're not so many, we're very small universities, so when I say all the urban studies teachers, I'm talking about four or five with our classes, which means, but that's more than a hundred students.

Cambria: We'll definitely reach out to you about that then.

Gio: The auditing, like they say like an hour of auditing the street, you'll get about 1.5 to two miles done if you're doing it correctly, if you're not speeding through it and actually going on both sides of the street.

Carla: Yes, I'm sure I know my Urban studies colleagues and I think they would be happy to do it. they will have fun doing it.

Cambria: In other cities they've hosted Mapathons where it's like an event with a lot of people and they audit streets together

Guilherme: This I just proposed to Llactalab. They will complete 10 years in May. Mm-hmm. So they will host hackathon or something like this. So I was going to propose if it could be a challenge, but it's nothing granted and it's a little bit out of date for you guys. We start with seeds and things go on after we go. It's still a possibility that we could cite with a pilot. And things could keep going on independent of who is in the head of it.

Gachau: Is there anything else the team should keep in mind when beginning to implement Project Sidewalk in Cuenca? Any other thoughts on it for us to implement it?

Carla: I think especially young people are going to be happy to do it. More adult peoples, we are not very happy with technology, it's not gonna be that easy to, to get help from older people. But I guess the people will be happy to do it. Now one important thing, I think hat we don't exclude neighborhoods. I think it's working with students because if you give people in their neighborhoods, we're going to have all the information of the middle, high socioeconomic level, information, because they work with technology, their neighborhoods are very safe, so they don't have a problem to go out and see the sidewalks. But in lower economic neighborhoods, uh, First of all are not very familiar with technology and they are not very happy to go out and walk in their neighborhoods. And so if we don't want to exclude neighborhoods, I think it's good to work with students because then we can make them go, but we have less participation of the society. Which is nice in your project that the people help mapping. I find that interesting. But I think a lot of areas are going to be without information if you do that

Guilherme: We were in contact also with, uh, the municipality and CONADIS and the next Friday we will have a sensation where they will go on wheelchairs through the city so they can experience things like this, which I think is also nice. How we involve them in their evaluation of what we could evaluate. So it's always critical that we will be a hundred percent accurate in that, in their perspective. So we'll do this, but we'll have to try to calibrate and see if it's adequate with their point of view too.

Carla: Excellent. It's very interesting.

Gio: And also in those dangerous neighborhoods, it's nice that all this can be donein your home. So even with those dangerous neighborhoods, you don't have to go.

Guilherme: Actually, that's why I also said about the calibration because our street view is from 2015. Google never visited us again. The Google car.So I suggested them that we do a pilot of doing it virtually and comparing with, that's actually, that will validate a small percentage to see if it's accurate enough or, or we'll say no, it won't work virtually because it's so out of date that it's not useful anymore. And we'll have to do it walking. But we will just be sure when we try to do both.

Gio: We actually just observed the neighborhood right over here. Mm-hmm. We took a bunch of pictures and we actually made labels for the same ones as Project Sidewalk. And tomorrow we're gonna go into Google Street View, do the same review of those streets, and see how different, how accurate, if it actually changed at all, And then we're gonna do that for other sites too. But yeah, we just started that one.

Sam: Even with it being virtual, do you think students would still be able to Engage?

Carla: Yes. Yes, of course.

Cambria: That was all of our questions. We just have one last question asking if you would reference anyone else we would talk to, to give us some insight on this project

Gio: Or maybe people you know that have gotten community engagement or sort of that type of thing.

Carla: Um, uh, well, I guess you have met most of them because as I told you at the beginning, we all know each other, we write with each other, we research with each other. But I don't know if you have talked to Vivianna Cordro. She; he's not living in Cuenca right now because she's doing her PhD in Europe, but she has this very interesting group, which is called Wasipichana, and they have done a lot of placemaking. Have you heard about placemaking? Well, placemaking strategies, which are working with people to improve their neighborhoods. And they have done some interesting projects here in Cuenca and they wrote two weeks ago, they want two more in Cuenca, for doing placemaking projects, which means working with people so I could give you her email and her phone number if you want to.

Guilherme: Actually, she's working with me, I can put you in contact with her.

Carla: because she's very nice and she has a different view, which is why I like working with her because I'm an architect and although I am an urbanist, I'm still very squared. But she is, she's a lawyer. So her input is very nice in our things.

Cambria: Well, unless you have any other feedback for us, this concludes our interview with you.

Gustavo Morejon

Interview Transcription
Gustavo Morejón Interview
March 24th, 2023 from 10:45-11:15 a.m. at Tres Puentes, Ave 27 de Febrero

Gio: Tenemos algunas preguntas, eh? Tú no puedes decir cuando quieres parar, si quieres o empezar en tu libro para por eso no tengas estrés es como una conversación. Algunas primeras preguntas, “Cuál es su título laboral y su experiencia en participación comunitaria?” Porque nosotros queremos tener más información como que nosotros podamos tener una comunidad porqué la aplicación que nosotros estamos componiendo es muy dependiente de la comunidad.

Y porque es una aplicación que hace una persona usar calles y puede hacer labels y como hacer puntos a lugares no son accesibles para personas con em en ruidas (wheelchairs)

Gustavo: Ah, sí!

Gio shows Gustvao what Project Sidewalk looks like

Gio: So es como, así tienes, eses como labels. Y puede que decir, si no hay una rampa, si hay obstrucción, or hacera, hay un problema en la surface. Y el último y puedes tener un mapa que, muestra los áreas que hay si no tienen rampas, o tienes un obstáculo y el gobierno puede usar estos datos para….cómo like?

Sam: Para hacer un cambio.

Gio: Sí, para hacer un cambio para pagar personas para revisar o construir esos para enfocar en las áreas que tienen necesitan más ayuda.

Gustavo: Okay. Perfecto.

Gio: Cual es tu título y cual es tu experiencia en participación comunitaria?

Gustavo: Muy bien, y yo soy de profesión biólogo. Y yo trabajo mucho con las relaciones entre el hombre y la naturaleza y la relación entre el medio ambiente y el desarrollo. Ese es mi campo de acción. Pero también soy biólogo informático. Si, yo trabajo mucho con programación de bases de datos y aplicaciones para análisis de biodiversidad. Eso es lo que yo hago.

Gio: Okey, yo sea Gary nos dijo que tu ayuda un grupo en los años pasado, como tag árboles. Apuntar a árboles. ¿Cómo fue eso?

Gustavo: Es un proyecto interesante. Lo que busca el proyecto es conocer. El número de árboles que existen en la ciudad. A qué especies corresponden si son nativas y son introducidas si son a especies benéficas o también hay algunas especies que son dañinas, por ejemplo, y permitir a través de ese análisis la planificación de las áreas verdes en la.

Sí, por qué? Bueno, Cuencas es una ciudad que ha crecido muchísimo últimamente. No? Y el temor de toda la gente en la ciudad es que este crecimiento reduzca las áreas verdes. Entonces, ese es un problema muy grande porque reduce la calidad de vida de la gente acá a los cuenca nos gustan mucho los ríos. Le gustan mucho los parques, no caminar y todo esto en las orillas de los ríos. Así que, eh, ha, es muy importante para nosotros el proteger estas áreas. Y el objetivo del proyecto de se llama se vio y era justamente el proveer a las autoridades, al municipio o a la prefectura. Y información para que ellos puedan planificar dónde se debe sembrar, qué se debe sembrar, qué lugares tienen más necesidades? Cuales tienen menos necesidades.

Gio: Al segundo pregunta, ¿cuánto tiempo ha vivido en cuenca o en la área?

Gustavo: Yo he vivido aquí los últimos 30 años más o menos más unos 35 años.

Gio: Y entonces, y a dónde eres?

Gustavo: Soy de aquí, un Cuencano. Ah, sí, pero cuando yo tenía unos cinco años. Primero fuimos a vivir en Colombia.

Gio: Ah si, a donde?

Gustavo: Ah, dónde a cali.

Gio: Ah, okay, mis padres son de Bogotá.

Gustavo: Ah, que chevere! No viví en Cali casi toda mi niñez. De ahí. Me moví de un lado para otro, eh? He viajado por todo el mundo. Estuve estudiando en los Estados Unidos en Arkansas, y luego regresé acá de ahí. Me fui a Dinamarca. Regresé de nuevo para acá y ahm. Llegué acá. Cuenca, conocí una cuenca y me casé.Así que ya ya me quedé acá.

Gio: Qué tácticas ha utilizado para la participación comunitaria ya sea con personas con discapacidades, o personas mayores? Porque eso es nuestro target para el proyecto.

Gustavo: Y bueno, la forma como me relaciono bastante con la comunidad es a través tanto de medios convencionales de comunicación como la prensa, como la radio, eh, esto y también redes sociales bastante. Y tengo un involucramiento muy fuerte con las universidades. Colegios escuelas. Y ellos no para llegar digamos a diferentes estratos. No, no solamente a eso. En cuanto a personas, eh, dada avanzada, no a personas mayores. Tenemos algunos grupos con los que trabajamos que son, eh, gente mayor que le gusta.

Y, por ejemplo, el fin de semana salimos al campo. O salimos acá a las orillas de los ríos, etiquetamos los árboles monitoreando los árboles. Ay, no les gusta mucho eso? Y incluso muchos extranjeros que han escogido Cuenca para que sea su lugar de retiro, no donde ellos vienen a pasar el resto de su vida. Entonces ella es gente mayor, gente jubilada y ellos, pues les gusta hacer esto y trabajamos con ellos, ¿no? Eh, obviamente no siempre.
Los lugares a los que vamos son lugares que son de un acceso muy fácil, no justo porque vamos a las orillas de los ríos o a los parques o lugares con árboles, ¿no? Pero eh, hasta aquí nuestra experiencia ha sido muy buena en ese sentido.

Gio: ¿Cómo logró involucrar los estudiantes de la Universidad Azuay en proyectos anteriores? Podría un proyecto con una restricción de tiempo de cinco semanas hacer algo similar porque nosotros estamos aquí por cinco semanas.

Gustavo: A ver eso es interesante porque la idea con la universidad, era que los alumnos de la universidad que ingresan a los primeros años de la universidad, ellos adoptan un árbol y ese árbol se convierte en su amigo por toda la carrera.

Entonces, hasta que se gradúan lo monitor brean lo cuidan, lo ven. Y eso es interesante porque establece una relación entre las personas y los árboles. Eh, al comienzo lo hicimos con los alumnos de la escuela de biología, luego con la escuela de ingeniería ambiental. Y luego colaboramos con la universidad. Y, por ejemplo, un colegio.

Entonces, eh, la gente de biología introducía el proyecto a la gente de la del colegio. Entonces, luego más gente y más gente comenzó a unirse. Y fue genial. Hasta ahora tenemos cerca de unos 7,000 árboles inventariados y que la gente los ha adoptado. Entonces, eso tiene un efecto muy bonito y es que cambia la actitud de la gente. El rato que tienes una relación ya directa es con la naturaleza. Tu forma de ver la naturaleza cambia. Ya no, es solamente el típico ciudadano que está, digamos que le gusta solamente el cemento, no lo que yo, un ciudadano gris.

Sí, ya se convierte en gente mucho más verde. Gente que le gusta más el campo, los árboles, las aves. No sé todo esto.

Gio: Esa aplicación es similar a eso para abrir los ojos. Como a todos los problemas que hay en Cuenca por personas con discapacidades, porque nosotros si no tenemos discapacidad no puedo entender los ahm distri los las dificultades de una persona que tienen.

Gustavo: Claro, es más o menos el mismo approach. Sí, tienes que hacer que la gente entienda cuál es el problema para luego poder enfrentarlo. Entonces, ahí no recuerdo qué organización luego te puedo mandar los datos, pero hubo una organización que cogía a gentes de industrias de comercios de colegios y le sacaba, por ejemplo, el fin de semana. Y descubran los ojos y los hacían caminar por el centro.

Gio: Nosotros tenemos algo de eso la próxima semana.

Gustavo: Eso es super bueno porque hace que la gente se dé cuenta. Cómo ve el mundo la gente que tenga dis capacidad.Y ah, resultó ser genial. Se fue una campaña muy buena. Si tengo los datos y esto los envío.

Gio: Okay, gracias. ¿Tiene alguna recomendación para que podamos involucrar a las personas en nuestro proyecto?

Gustavo: A ver, y yo creo que sería bueno que ustedes tengan contacto con las organizaciones. Gubernamentales civiles en fines de lucro que trabajan en labor social. No los que trabajan con eh, gente que tiene dificultades visuales o gente que anda en sillas de ruedas o diferentes tipos de discapacidad, no?

Entonces hay algunas organizaciones aquí en Cuenca que trabajan con ellos. Entonces, acercarse a esas organizaciones y ya tienen estadísticas que ya tienen experiencia. Eso sería muy bueno, no ya. Entonces, eh? Quizá lo primero que yo haría sería justamente hacer una lista de estas organizaciones y planificar el poder, eh? Contactar con estas organizaciones.

Gio: Ah, recomienda que vamos con algún grupo poblacional específico para que nos ayudan con ese proyecto? Si conoces….

Gustavo: Eh, a ver el hay algunas organizaciones que te podría mencionar una de ellas es “Sendas”. Sendas es una organización no gubernamental y sin fines de lucro que trabaja con grupos minoritarios. Bueno, con mucha labor social, no hay otro que se llama acceso social. Ah, bueno, hay un poco de estos. Yo les puedo mandar más tiempo por WhatsApp?

Gio: Sí!

Gustavo: Si, se puede mandar una lista más o menos? Y si tengo los contactos de con quién pueden contactar. Que pueden hablar con ellos.

Gio: Okay. Y la pregunta final es, conoce a alguien más que sería beneficioso. Para que, nos entrevimos en relación con nuestro proyecto.

Gustavo: Y a ver, una persona que sería interesante que converse con ustedes es María Isabel Cordero. Yo les puedo mandar también el teléfono y los datos de sí. Ella trabaja justamente con sendas.

Es la directora de sendas y podría hablar, otra persona muy interesante es Victoria Tamariz. Ella trabaja con gente que tiene algunos grados de retraso mental o gente que no tienen buen desarrollo mental y cómo incorporarlos en la sociedad. La labor de ella es increíble. Este es una historia que vale la pena conocer.

Entonces, yo creo que a ella debería contactarle. También tiene mucha experiencia, mucha, mucha experiencia.

Gio: Okey, esas fue todas esas preguntas que nosotros tenemos. Pero si tienes algo que decir o preguntarnos, bueno,

Gustavo: Y la con relación a la aplicación, quién va a utilizar la aplicación?

Gio: ¿Quién? Sí? Oh. To alguien que tienen internet o un computadora puede usando y es usa el go ship para revisarlos para que tú puedes ver los calles y puedes hacer los revisas.

Gustavo: Entonces va ser, va ser una aplicación móvil para ciencias ciudad?

Gio: Ah no es como una website.

Gustavo: Bueno, les voy a hablar en inglés porque es importante ya. Who 's going to take the data? Who's going to walk in the streets and say "oh, there is a problem here and there is a problem there".

Gio: Oh, so the data is collected through the server.

Gustavo: But who is going to do that?

Gio: Oh, like who is going to audit the streets?

Gustavo: Like, am I going to walk in the streets with a computer?

Gio: Yo puedo hacerlo ahora. Si, yo tengo el internet. Eso es Seattle y es algunos de los ciudades que Project Sidewalk esta nutriendo. Y yo puedo…I can start exploring the city aqui, or I can start validating.

Cambria: Do you have the presentation open?

Gio: Yeah.

Cambria: Show him the platform.

Gustavo: In order to have that you need to have acquiring data. Okay, so who is going to collect this data?

Because you need to first have all the data that you are going to map and the data you are going to use for statistics or whatever you choose. So you need someone collecting data in the city.

For example, in that street it is really hard to walk because there are lots of stones in the street.

Gio: Yeah, that is part of the reason why we are doing this. The way that this thing works in other cities is that they get the community involved and the community will use the application.

Gio shows Gustvao what Project Sidewalk looks like

So this is what it looks like. And you have the Google Street View right here, from your computer you can just review the streets and put the labels. You don't have to go outside, you can just do it in your house.

Gustavo: If I find a problem in the city, do I have to come back to my house and then I have to insert the labels?

Gio: Yeah.

Gustavo: I know an experience because I work for them in Amsterdam. There is an application for every citizen, a mobile application, if you go to the streets and find a problem you can report it on your phone. You simply say "there is a fallen tree somewhere", you just click on the location, take a picture, and it goes directly to the municipality. So they can take action. It happened to be a really good application because it gave a lot of statistics to the government.

Gio: Project Sidewalk is also in Amsterdam so that is something we can look into too.

Gustavo: Something like that can be really useful. Because some of the people, if you are walking in the city and see something you can just forget it. Or, I don't know, probably you forget what you really saw. It would be really nice to have a mobile application so people can click on it and report

Cambria: So we are in contact with the developers of this software and we were gonna ask them about a mobile platform for this software. Because obviously something like that can be very helpful.

Gio: Yeah like right now, you can get to the application through your phone, but it only lets you validate the streets that have already been audited. Like you just say "oh yes that is a missing curb ramp or no". They also have AI in the system that auto validates everything that a person would put to make sure there isn't any false data.

Gustavo: Yes, that's good. The reason I was telling you that is because I was having a meeting yesterday with SRI, the people that make arches. We were talking about a new application that we are working with to track the bears in the forest, a rainforest close to Quito. We are tracking something like 15 bears in there and we are building an application based on SRI software. It's very fast to develop and to use it. Maybe, it's just an idea.

Gio: Yeah, no, thank you. We will take that into consideration as well. Because Cuenca right now has some data on accessibility in the streets with Mappillary, but it does not show the severity of it, or what's actually wrong. It just says “there is something wrong here”. So, this is just another way so that the city can have more data on what exactly, especially in Cuenca. There are a lot of driveways in the sidewalk that block a walking path. It is a big problem here, so that way it gives them an idea of what areas are the most affected and which ones need to put focus on.

Gustavo: Great, great, what a fantastic job. It is going to be interesting.

Gio: Yeah, thank you! Those are all the questions we have.

Gustavo: If you ever need anything just reach out to me through WhatsApp. Okay?

Gio: Yeah, thank you so much.

Israel Idrovo

Interview Transcription
Professor Israel Idrovo
March 28th, 2023 from 3:30-4:30 p.m. in UCuenca’s Llacta Labs

Israel: Desde la antropología sea antropólogo por grupo de antropología, ortografías caídos y trabajos, sobre todo en antropología de las discapacidades, personas con discapacidad y bueno, también espacio público con Daniel y bueno, las a las.

Sam: Somos un grupo de estudiantes universitarios del Worcester Polytechnic y estamos trabajando con EMOV para ayudar en sus esfuerzos para mejorar la seguridad en las calles en Cuenca mediante la implementación del proyecto acera y vamos a determinar meteos para involucrar a la comunidad. Project Acera es una plataforma que permite a los usuarios auditar las calles a través de los usuarios viajan a lo largo de las calles de unidad para identificar a los efectos accesibles o accesibles de las calles como fin de crear una representación de las áreas en la ciudad. este se depende de la capacidad de la comunidad para participar y nos gustaría hacerle un serie de preguntas de entrevistas sobre las limitaciones con la documentación de en cuenta y los métodos para involucrar.

Israel: Perfecto.

Gachau: Sí y duramente a 60 minutos. Ah, pero el tiempo puede variar depend del flujo de. No hay estos anticipados para usted ni perfiló los correctos para usted por participar en esa entrevista. Sus dispersas nos ayudarán a detener mejor como podemos mejor a la admira en

en este proyecto. Esta entrevista será grabada en audio, pero usted tiene el derecho de rechazar la aprobación. Su nombre no se asociada con los sus respuestas en nuestro fo del. Entrevista es completamente voluntario. Usted tiene el derecho de no responder a ninguna pregunta de la entrevista si quieres

Israel: Perfecto.

Gio: Este es la aplicación y las personas pueden revisar calles virtualmente usando Google Street View y tienes algunos como puntos que sí hay un rampa, si no hay un rampa y hay obstrucciones en la acera, si hay problemas con las aceras, y si no hay una acrea y también si hay crosswalk o si hay señales para peatones.

Gio: Puede dar un rating a uno hasta cinco, uno es muy bien. Puede pasar Y cinco es mal, no puede pasar. Y tienen algunas descripciones. Si, por ejemplo, una destrucción, si es un pole o es un árbol o es un como basura o algo que así puedes tener descripciones y el último meta es para tener un mapa con todos los puntos de rampas, de problemas con la aceras y puedes ver, a dónde es la problema más grande. Y también hay un otro mapa en el que se puede ver lo más menos rojo es bueno, no hay más problemas, hay menos problemas y lo más rojo es un problema. Hay más problemas con las aceras y es beneficioso para el gobierno, personas que trabaja en mejorando las aceras para saber a dónde es el problema más grande o para la comunidad, por ejemplo, para abrir sus ojos. Ver es un problema más grande en nuestra ciudad. Este es la programa que nosotros somos, trabajando con

Israel: Excelente y los datos que alimentan. Este programa lo cogimos ustedes.

Gio: Alguna persona puede obtener los datos del programa.

Israel: Pero quién me alimenta aquí? Mente los datos.

Gio: es la comunidad. Tú puedes hacerlo en tu computadora y puedes revisar. tienen como misión? No sé.

Israel: Sí, tarea.

Gio: Sí, sí. Y. Este tarea es como dos miles

Israel: Tú compartas su tarea.

Gio: Sí. eso es como funciona la aplicación.

Israel: Sí

Sam: Por eso tenemos algunas preguntas. Cuánto hace que vive en Cuenca.

Israel: Yo nací aquí hace 40 años. Por seis años Viví en quito, pero aquí el vivido la mayor parte del vida,

Gio: cual es tu título de trabajo y de experiencia con infraestructura.

Israel: Ya soy antropólogo y he trabajado asuntos de accesibilidad con personas con discapacidad, principalmente en ciegos.

Gio: Y de qué manera podría la ciudad mejor su enfoque de la accesibilidad?

Israel: Es una pregunta compleja. Sería muchas formas, pero pienso en dos o tres cosas qué sentido es muy importante cuando hecho investigación, digamos la accesibilidad. Ah, uno, siento que hay como mucha, yo diría. Arrogancia como mucha, digamos, como en, los técnicos especializados creen que saben todo ah sobre accesibilidad y creen que lo que aprendieron en manuales en su formación, eh, se puede aplicar y ya está. Entonces creo que hay como ruptura entre los técnicos que planifican la ciudad y los usuarios que lo viene. Normalmente se les consulta cuando ya está una obra realizada, es decir, para validar lo que ya se ha hecho, no para pensar con ellos de las necesidades. Entonces, como hay como los técnicos imponen a veces una visión de la ciudad, una infraestructura hacia sin consultar a la gente

Israel: luego, eh, creo que hay una visión equivocada, una idea equivocada de la accesibilidad de la inclusión, porque se cree que un espacio accesible es un espacio para personas con discapacidad solo para personas con discapacidades. Entonces hay un conflicto, una tensión y he hecho entrevistas a técnicos, por ejemplo, municipales técnicos que trabajan, que es como quizás no vale la pena invertir mucho dinero en rampas en accesibilidad si son pocas personas con discapacidad, cuando sale uno a la calle, no ve normalmente personas con discapacidad y cree que no se justifica invertir si hay pocos usuarios con discapacidad. Pero claro, eso es un círculo vicioso porque no se Invierte, no se da dinero para accesibilidad porque supuestamente no hay muchas personas con discapacidad. Es usuario, pero no hay muchos usuarios porque no se invierten. Sin espacio sino accesible. Pues las personas ciegas no salen. Uno use es un círculo vicioso. No hay inversión porque no porque aparentemente no hay pero no hay porque no hay inversión.

Israel: Eso es otro problema, así como muy importante y otro quizás un tercer problema que yo siento es que, eh, no se cumplen las normas técnicas. No sé, no se cumplen las normas técnicas de accesibilidad, por ejemplo, pero por qué sienten a veces las instituciones, Como la obligación de adecuar el espacio. Entonces tenemos que hacer rampas, por ejemplo, y hacen rampas, pero a veces como una inclinación que nos adecuada, hay una diferencia entre la base y la el material es demasiado resbaloso decir no se preocupan por cumplir bien, sino por cumplir, porque entonces. Siento que hay como sienten la obligación de completo, no tienen las sensibilidades de saber que hay gente que va a ser útil, sino simplemente cumplen por cumplir la ley, pero la cumplen mal. pasa igual con el piso, todo táctil que es para personas ciegas. El piso ponen porque tienen que poner pero no saben muy bien cómo debe poner y qué hacen cual. Cualquier cosa. Entonces eso también es otro elemento. Luego, claro, es difícil también.

Yo entiendo porque algunas acciones en la ciudad que son buenas para una persona ciega, por ejemplo, puede que no sean buenas, pero personas si hay ruedas o una persona con otras discapacidades porque son casi mundos diferentes, es capacidad física sensorial de la de auditiva de la intelectual. Entonces es difícil tener soluciones buenas para todos, para niños, para ancianos, para mujeres. Pero claro, es el reto. Quizá por ahí pensaría la respuesta.

Gachau: En su opinión, cuál es la peor situación de Cuenca en materia de accesibilidad?

Israel: Yo diría, y esto no es lo común, que lo más grave en términos de accesibilidad no es la infraestructura, sino la actitud de la gente. Digamos, es un problema más de conducta que de infraestructura decir em, por poner un ejemplo en cuenca hay en toda esquina están los pasos cebras están pintadas en señales del espacio peatonal pero nadie frena en un paso cero decir, están ahí dos paso cero, pero los carros igual pasan y no respetan el tratado. Están las ciclo vías para andar en bicicleta, pero los carros estacionan, ahí están las rampas para personas con discapacidad, pero los carros se están llenando en la entonces.

Israel: Creo que a veces es como que se piensa que lo más importante es dar dinero a infraestructura con rampas, poner ascensores, yo creo que lo más importante es trabajar en la actitud de la gente, la sensibilidad de la gente, la solidaridad de la gente. Yo creo que ese es el principal obstáculo porque las personas piensan que hay que hacer cosas accesibles porque están obligadas a hacer y lo hacen de mala gana con rabia, con que pesar no piensan que eso es bueno para para la sociedad, para todos. Sí. Yo creo que la actitud es lo más. El tema es que eso se ve mucho en discapacidad normalmente cuando al el tema de discapacidad se ve en dos extremos.

O con indiferencia, como si no existiera, no me importa o con pena de pobres y no. Y tal con lástima con pena. Entonces no se entiende bien la habilidad como bien, como mmh. Muy bien.

Sam: qué tipo de recursos están disponibles y son más importantes para abordar estos desafíos.

Israel: creo que en Cuenca hay pocos recursos para sensibilidad o para personas con discapacidad. Sin embargo, no sé si ustedes han estado de nuestra ciudades

Gio: Solo en Cuenca.

Israel: Aquí hay poco, pero comparativamente, este es una de las mejores ciudades para vivir y no sólo del ecuador día de la región. O sea, aquí hay mucha violencia en el uso del auto, por ejemplo, pero en Quito es muchísimo más, en Guayaquil, Es muchísimo peor, en Caracas, ni se diga lima, Terrible. Bogotá es, o sea, en el contexto latinoamericano, este es una de las ciudades más ordenadas, más accesibles, más amigables. No, no digo que esté bien. Sí, de hecho no está bien, pero en el contexto latinoamericano, hay ciudades aún mucho más violentas, mucho más desatendidas, mucho más peligrosas, mucho más. Esta es una ciudad más o menos amigable para caminar, salir, para, en fin. Y también porque es una ciudad no

muy grande es una ciudad mediana, diría. tampoco es tan pequeña, pero tampoco es tan grande. Entonces, hay cosas que se resuelven más fácilmente que en las grandes ciudades latinoamericanas de millones y habitantes. Pero siendo más eh concreto a la pregunta, no creo que, digamos, no hay muchas, por ejemplo, no hay semáforos Auditivos para en personas ciegas. No hay pisos con táctiles? No, no hay muchas las veredas están en mal estado. No se respeta el peatón. No hay señalizaciones accesibles. Servicios accesibles.
Los buses son inaccesibles para una persona silla de ruedas o para una persona con discapacidad. El servicio no es, hay mucho que hacer. No, no hay. Digo, si vemos otras ciudades donde han tenido tiene mucho más oportunidades, mucho más respeto también. Sí.

Gachau: ¿Cuáles cree que son los primeros pasos necesarios para avanzar en el abordaje de la accesibilidad?

Israel: Creo que hay que hacer campañas de educación para entender la discapacidad de manera crítica profunda y para entender el valor de la accesibilidad. Hay la idea de que en un espacio accesible sólo se benefician personas con discapacidad y hay que educar que un espacio accesible es bueno para toda la ciudad.
Segundo, hay que entender también la diferencia entre inclusión y segregación, digamos también porque hay, por ejemplo, un parque inclusivo o hay un baño para personas con discapacidad cuando todos los parques deberían ser inclusivos, todos los baños deberían estar adaptados entonces, pero primero sin duda, educación después también infraestructura. Porque las veredas están vacías y es un problema que pasa no solo aquí, pasa en Latinoamérica y creo en el mundo se invierte mucho más en, digamos en hay más inversión en dar facilidades al auto que el peatón que caminan. Se invierte mucho en carreteras, en parqueaderos en dar facilidad al auto y poco en dar facilidad al ciclista, al peatón.

Entonces lo segundo es, o sea, primero digo educación. Segundo, digo eh, y optimizar los donde se ponen el dinero priorizar. ¿Dónde se pone el dinero? Porque, claro, somos países que tienen pocos recursos, poco dinero ya por con más razón esos ese poco dinero hay que invertir de manera efectivo que sea versión que vale.

Gio: Estaría dispuesto a utilizar Project Sidewalk para revisar virtualmente las calles de Cuenca e identificar áreas inaccesibles?

Israel: Sí, pero eh, un tema que es clave es que el programa me permite, o sea que no me exija demasiado estar pendiente de la aplicación mientras me muero de disfraz.

Gio: Cómo una aportación, su teléfono

Israel: sea, por ejemplo, estoy pensando que la aplicación que yo pueda pasar mi recorrido, decir como, como en Google maps que me dice voy aquí, acá.

Gio: **Explains AccessMaps and how it navigates people with regard to their discapacity in regard to mobility, saying how that used to be the goal but due to the strict timeline it is something to look forward too in the future**

Gachau: Para el próximo, pregunto, tengo dos en uno. Sí, En su opinión, ¿cómo podemos involucrar a la comunidad para que participe en la auditoría de calles a través del Project Sidewalk? En el pasado, otras ciudades han organizado mapatones u ofrecido crédito de servicio comunitario por participar. ¿Parecen estos métodos efectivos de participación comunitaria?

Israel: A ver, también es complicada la pregunta, pero creo que es clave que pueda haber, como un ejemplo que pueda ser inspirador de las autoridades. Yo pienso, por ejemplo, en experiencias que han sido exitosas de cambios de mentalidad de la gente y de participación donde han sido un presidente, un alcalde o líder que ha que ha podido motivar a la gente de por qué, como un proyecto de ciudad. Es difícil que un ciudadano de su tiempo si no siente que esto es algo que tiene importancia, que va a tener resultado como un proyecto de ciudad, porque siento yo que la principal problema, la principal limitación de un proyecto como el suyo es que la gente a veces ya ya no cree que vaya a ser efectivo y que vaya a ser útil porque ha habido habido mucha de experiencias que se han querido hacer cosas, pero que no han tenido todo el apoyo. Entonces mucha gente dice esto si era interesante, pero no va a resultar no vaya a ser un fin, No va a llegar a nada. Entonces no voy a perder mi tiempo. No voy a comprometerme, no voy a participar si esto no. Entonces yo creo que es clave que sea como una iniciativa, como de de varios sectores de la sociedad que esté involucrado el la alcaldía, por ejemplo, que es fundamental que estén involucradas las universidades, por ejemplo, que esté involucrado sectores que en otros contexto no parece importante como la iglesia, por ejemplo, en Europa. No me imagino qué tiene que hacer la iglesia ahí. Es decir, por qué no? No tiene nada que deber en una sociedad latinoamericana tan religiosa el papel que puede cumplirlos, los religiosos, puede ser motivador puede ser importante.
Entonces, pienso, por ejemplo, en la experiencia de Bogotá con manzanas mocos de que fue un alcalde antiguo o sea, él metió mucho desde el ejemplo, desde la educación, se empujó un proyecto conjunto. En otras palabras, yo creo que una forma de involucrar a las personas en un proyecto así es garantizando, escuchando la seguridad de que es un proyecto con apoyo y que con muchas e instituciones que lo apoyan y que puede ser como algo que se pueda hacer.

Sí,

Gachau: Tiene alguna idea para que los estudiantes y la universidad ayuden al mapa de cuenca. Por ejemplo, en otras ciudades los profesores crearon una tarea para que sus estudiantes hagan un cierto número de calles. ¿Es esto algo que podrías verte haciendo?

Israel: Sí. Yo creo que hay esa posibilidad. Creo que no es difícil porque los estudiantes en esta universidad que es pública tienen antes de graduarse que cumplir un número de horas de servicio comunitario de vinculación con la comunidad que no son pocas, son muchas. También son 64 horas.

Entonces, más bien, a veces hay estudiantes que no saben dónde cumplir, que están buscando. Si necesito hacer algo para cumplir estas obras, entonces creo que si, por ejemplo, la iniciativa aquí se habla con la dirección de vinculación con la sociedad de la universidad, pueden haber muchos estudiantes que estén interesados.
Dos, hay muchas carreras y materias donde se estudia ese tipo de cosas que puede ser parte de las prácticas del la plaza. Por ejemplo, en la facultad de arquitectura trabaja mucho. Esto puede ser una actividad de clase que pueda ser que tenga una nota, de manera que los estudiantes no sientan que están haciendo un esfuerzo extra, sino que están cubriendo su su su materia. Si es posible.

Gachau: En Project Sidewalk, actualmente hay siete categorías de obstáculos en las aceras, incluyendo rampas de bordillo faltantes y problemas de superficie, entre otros. Estamos considerando agregar otra categoría para Cuenca: Entradas a garajes.
¿Cree que esto sería una buena adición?

Israel: Sí, definitivamente uno no solo porque afecta al espacio la infraestructura, sino porque la gente estaciona ahí sus carros, no necesariamente adentro, sino es como se hace dueño de todo ese espacio de la vida. Eso es algo que estudiaron justamente Daniel con Maria

Gio: Conoces a alguien con quien podamos hablar para obtener más información sobre este tema?

Israel: Yo creo, bueno, entiendo, están trabajando directamente con la EMOV, pero puede ser importante en el municipio en el, digamos área, no es este sino el departamento de obras públicas los que hacen la intervenciones en el espacio no tienen problemas de sobre. Es muy interesante porque ahí uno puede saber cuál es la visión de ciudad que tiene el municipio que tiene la institucionalidad.Entonces, yo creo que puede ser una buena entrevista, quizás. O puede ser incluso áreas históricas editorial históricas, porque, claro, esto es una ciudad patrimonio y tiene también algunas complicaciones para cierto tipo de intervención y cada algunas particularidades. Yo pensaría que que que hay no se ocurre más aquí?
No, no, no, no es algo que se estudia mucho. Pero en el municipio, si, creo que las obras públicas y las históricas, son dos espaciosos importantes.

Gio: Perfecto. Si tienes algo más para decir.

Israel: Sí, quizás lo único que dirías, mi experiencia ha sido sobre todo con personas ciegas y entonces ahí hay una cosa bien importante porque cuando no se, sin trabajo con la gente, un trabajo incluso etnográfico con la gente en el espacio, uno a veces intentando hacer cosas buenas, terminan haciendo cosas mala. Pienso, por ejemplo, en los asuntos de diseño universal o la accesibilidad universal que ya entonces, por ejemplo, en Cuenca hicieron muchas plazas pusieron a ras sin verdura digamos, en mismo nivel las calles. Veré supuestamente para que sea más accesible en silla de ruedas. Pero, por ejemplo, la especie de los ciego, ellos necesitan el filo de la acera de la vereda para guiarse con su bastón para poder caminar. Claro ciego. Si van por la calle, tienen que o tocar el filo de la vereda o tocar la pared. Pero el

problema de la pared es que en el centro, muchos almacenes sacan plantas, macetas, refrigeradoras, electrodomésticos, publicidad. Entonces no pueden ir por la pared porque van chocando. Tienen que ir por la fila de la vereda pero como ya no hay, no tienen cómo saber si están en la acera, si están en media calle, si están en peligro. Entonces es como pensar que cada discapacidad tiene una característica particular. Por ejemplo, la plaza de santo domingo quitaron todo e hicieron como una sola espacio abierto.
Supuestamente es más accesible. Pero otra vez para un ciego, al no tener referencias y todo, ser una sola esplanada no saben por dónde ir, se pierden. Es más problemático y es dificultoso. Entonces, creo que la clave. Estar probando, incluso haciendo intervenciones no todavía definitivas de urbanismo táctico o de soluciones, digamos cada nivel de prototipo, probar y luego de probar hacer esas, aquí se hace y después se prueba primero se hace la abre.
Eso es algo importante.

Everyone: Gracias.

Israel: Gracias.

Professor Adriana Larriva

Interview Transcription
Professor Adriana Larriva
March 28th, 2023 from 3:30-4:30 p.m. in UCuenca's Llacta Labs

Sam: The first one is, how long have you lived in Cuenca?

Larriva: Four years old to 40 years old.

Gachau: Our next question is, what is your job title and experience with infrastructure and accessibility?

Larriva: I am a person who walks every day. I notice that it's very difficult for me, even though I don't have any disability or physical obstacle. The sidewalks are very high. And it's very difficult actually to be respected by drivers, by motorcycles. And there is a kind of disrespect of the law, of the pedestrians, and the crosswalks. There is a lot of this situation that is a little stressful to work in Cuenca. And I also notice that sometimes when you walk alone, it's fine the space, but when you have to work with somebody else, near you or to help another person, it is very difficult.

Cambria: What kind of work do you do?

Larriva: I am an architect, so I work in design and construction. And also I work here as a researcher to collaborate with Llacta Lab.

Gio: Next question, in what ways could the city improve its approach to accessibility?

Larriva: I think that it's very important, first of all, that really the people think that it's important. I think that one problem is that we don't have the experience of walking in the city. We are a kind of society that usually goes everywhere by car, some people by bus. It's not too common that people walk to go to school or to go to work, just maybe little trips. But we are always used to going by cars. So we don't notice what is really the problem about the sidewalks or walking. We didn't see the problem. So in this respect, we don't ask the authorities to have better set goals and better urban design to have better accessibility. And sometimes, you can hear people say that, well, we don't have people in wheelchairs. We don't have old people with problems, but it's because really the people can't go out and stay, and work in the public space, due to these obstacles.

Gachau: All right, so follow up on that question. In your opinion, what's Cuenca's worst situation with respect to accessibility?

Larriva: I think the height of the sidewalks. And the fact that we can't do continuous trip walking. And a lot of buildings, for example, don't have adequate ramps to go in. And also, public transportation has a lot of limitations because you can go to the bus driver if you have some problems like wheelchairs and it's very difficult; it's very limited.

Gachau: What kind of resources are available and most important for addressing these challenges and issues?

Larriva: Could you repeat it please?

Gachau: In your opinion, what kind of resources are available and most important for addressing these issues, like fixing these issues?

Larriva: Available… That is a good question. Another research group that has been working on this topic and we have been focused on the pedestrian environment. We have some results that evidence the problems that we have. Because actually we have a kind of normative regulation that actually is not accurate to guarantee the accessibility to disabled people.

Gio: What do you think are the first necessary steps to make progress in addressing accessibility?

Larriva: Well, I think it is very complex because I really think that we really have to make the people who get involved in this. And maybe we should do a kind of exercise to experience going by wheelchair in the city. And maybe that experience will make you feel that something is missing in the city. I think that we need to talk more about the public spaces at the university and to be more involved as citizens because sometimes the practice here has been that the government, for example, just uses the regulations that we have, but it's not useful to guarantee

accessibility. Everybody says that we should start with the kids. I agree, but not completely because actually the adults who are driving everywhere, every day, we don't have that experience in those comparability situations.

Ilana: Okay. Our next question is, would you be willing to utilize Project Sidewalk, which was what he showed to you virtually, to review Cuenca's streets and identify inaccessible areas?

Larriva: Yes, I know a lot.

Gio: Do you think other members of the community or people that you know would be willing to participate in auditing using this application.

Larriva: Yes. We talk, but we don't do anything under respect. Yes. So maybe if I think that it's very useful what you show me, because when you can see in a map where these problems are I think that people would feel more comfortable to put a point and say this is the problem. Yeah. We are experts at complaining but not doing anything else.

Cam: Part of our project is finding ways to get communities involved with Project Sidewalk. So do you have any ideas to get students at the university to help out with this project? For example, in other cities, professors created an assignment for students to complete a certain number of miles. Is that something you could see the school doing here?

Larriva: Here yes well, the university actually has a specific program. In the schools and high schools they have an environmental education course and part of this is the behavior as a pedestrian, as a driver, as a cyclist. That is the only part that I think that is involved within the school education actually, but it's not something that is obligatory. That is something that you have to ask EMOV to do. That goes for the children or for the adolescents. But in the university, just a specific research that's getting done, maybe support some activities to inform about it.

Cambria: It could be used like community service hours. So I know the students here have to do 64 hours of community service. So we were also thinking maybe it could be involved with that.

Larriva: It depends actually on the topic of the professional career that they are studying. Maybe there is some optional subject that you could do.

Gio: In your opinion, how can we best engage just the community in general to participate in auditing the street in Project Sidewalk? In the past, other cities have hosted mapathons or have offered community service credit for participating. Do these seem like effective methods of engagement or do you have any other methods maybe that you can think of?

Larriva: Well, we are doing research, but the most important people are not familiar with this tool. Maybe it would be great if in spaces like parks or recreational equipment, be there and have a kind of event to know "what do you think about the accessibility in Cuenca?". Maybe not

a specific task, but ask “How do you feel to walk in Cuenca? What are your worries?” and they could experience the tool to visualize you know, what are you thinking? And they can show that. But I think that maybe if you would like to achieve a more different edge, maybe you could go to recreational parks to do that. The university, the schools also is another space where you can work and maybe some business, a big enterprise.

Gio: In Project Sidewalk that showed you that there were seven categories, different types of labels. sidewalk obstacles, missing curb, surface problems, among others. We are considering adding another category specifically for Cuenca, garage entrances or driveways entrances. Do you think that would be a beneficial addition? Because we've noticed in our observations that a lot of the sidewalks either have surface problems because of the driveway, they don't have a ramp for a driveway, or just an obstacle like that.

Larriva: Could you repeat to me the options that you have now?

Gio: I can show you right now there's curb ramp, missing curb ramp, obstacle in path, surface problem, no sidewalk. And then they have other labels for crosswalks and pedestrian signals. So we're thinking about adding another one specifically for Cuenca. Because this was developed in the United States. And in the United States, the driveways being on the sidewalk isn't really an issue, but here it is.

Larriva: Well, the obstacle in path, we have a lot. Like actually the ramps to go into the house. A lot.

Gio: So we're just thinking about making that type of thing, like its own separate label.

Larriva: I think it is important to notice that because we have the regulation for buildings and all the time you have these elements in all the sidewalks in Cunca, and the people really don't think that it's a problem. I think that actually there are ramps to go into the house, but the ramps are built in the sidewalk, Also the ramps for the cars sometimes almost occupy the most power. And we have ramps that have a kind of slope to the street. Like there's like very little room. It's very difficult for old people to walk on the sidewalk. They used to walk on the street because of this slope. I think that it's really a problem. And I know that we have to walk to the car, but a real problem that we have is the height of the sidewalk. I think this is very specific. Not only in Cuenca, but in all the cities. And maybe, I don't know if you have considered the trees or vegetation. Yeah, because about comfort, we are very high, but the sunny days are tough. You can go to work for a long time. Yeah. It can be very difficult. We don't have any shade. So maybe it could be better. It could be more comfortable, friendly for children and for older people. We used to have cars parking on the sidewalk. Sometimes the parking spaces in front of the commercial buildings are short. We have big, I don't know why, but we have big cars here and sometimes they occupy all the space on the sidewalk.

Gio: Last question, do you have any other contacts or references for anyone that we can talk to to get more insight about this topic?

Larriva: I think the municipality has houses for older people. It's called the La Casa de la Tuto Mayor. The house of elderly people. Yeah. I think that it is very interesting and important to have their perception about it because they work with them, they take care of them. We have a blind association. And I think that they're going to give you more information about the obstacles that they have. For example, here we used to have some kind of guard for the garbage. And they had had a lot of accidents. I think that it could be a good one.

Gio: If you do think of something, you can just email. Those are all the questions that we have, so if you have anything else to add.

Juan Carlos Freiré

Interview Transcription
Juan Carlos Freiré
March 29th, 2023 from 10:30-11:30 a.m. at Escuela Taller Cdla Tomebamba

Gio: Y tienen algunos puntos como si hay un rampa y no hay unas y hay obstáculos en la acera si hay problemas en la superficie de la acer, si no hay una y puede estar un. Como a uno a cinco o cinco es no es posible. Y uno es bueno, es y tienes también descripciones, por ejemplo, ese es un problema de superficie de cera.Si tienes algunos como, eh, son, son, eh lastimadas eh? Como no son, eh, hay una diferencia en en he alguno puede. Describir qué es la problema y la última meta es para tener un mapa. Es una ciudad en New Jersey y que usa pero ese es un mapa que. Puede mostrar los las áreas que no tienen, eh, acera o no tienen que un rampa o cualquier cosa, y es muy beneficio para una ciudad para conocer las áreas que no son más mal lo las áreas que son las más inaccesibles y para enfocar en esas áreas y también para Ahm la comunidad para ahm aprender en, más de las problemas de la ciudad y pueden como abrir ojos de solución.

Juan: Sí, sí, sí.

Gio: Y también puede tener un ocho mapa que es, eh, problemas de la acera, eh, per mila. Ah, la más, la la menos rojo es como, es, no es un gran problema, pero la más rojo es si es un gran problema.

Juan: Ahora ustedes quieren hacer un mapeo de las zona de aquí de cuenca del centro histórico.

Gio: Sí, sí.

Juan: Para poner qué parte es más accesible? ¿Cuál es menos así?

Gio: Sí, sí. Para tener puntos en las calles, tener como datos para que alguien pueda usar

Juan: yo hace algunos años, hicimos, eh, un estudio a sí mismo con eh, de justamente sobre accesibilidad en todo el casco, eh? Céntrico de la ciudad. Toda la fuerte de centro histórico. Hicimos un Mapeo De todas las partes que necesitaban cambios de tipo de veredas en las inclinaciones de todo eso. Sí,

Sam: tenemos algunas preguntas. Primero, cuánto hace Vives en cuenca?

Juan: Hace cuánto toda mi vida hace 36 años.

Sam: Y cómo te mueves nuevamente para cuenca en automóvil un autobús como lo haces?

Juan: desde hace un tiempo en automóvil. Hace unos cuatros

Gachau: Con que frecuencia recorre las calles de cuenca como peaton?

Juan: Una vez de la semana o cada 15 días.

Gachau: Sí, alguna vez hay tenido primeros con la que a hacer agujeros a la acera o explosiones a la o el ancho de pero danos un ejemplo de lo que suicidó

Juan: Todo el tiempo tengo. Las rampas son demasiado inclinadas. Sí, mmh. Y el material de las baldosas también es resbaloso cuando llueve. Eso es, es difícil Que similares los.

Gio: Conoces a alguien más que haya sufrido este desafío, señales, alguien más?

Juan: Sí, tengo amigos que usa también, pero no sé. O sea, tengo una amiga que es mucho más. Ella recorre todo el lado en esos silla. Entonces es mucho más. Yo recuerdo más en cara. Es bueno porque estoy aquí en el trabajo Y si tengo algo que hacer, me voy en carro al centro, pero ella recorre, creo que un poco más, más independiente, más fuerte.

Gio: otra pregunta. La falta de enseñar tivas cerca de las secciones ha afectado alguna vez su capacidad para moverse con seguridad?

Juan: Si, falta de señal ética de letreros. Y eso

Gio: en los semáforos sientes que tienen suficiente tiempo para cruzar la calle del manera. Entonces sería que el semáforo dura mas?

Juan: no el tiempo está bien.

Gio: estaría después a utilizar para revisar virtualmente las calles de cuenca y a identificar áreas inaccesibles.

Juan: A ver esa aplicación, cómo me ayuda? Es una aplicación para celular.

Gio: No es en tu computadora. Tienes un co para si tienes internet, puedes hacerlo

Juan: y cómo me ayuda esta aplicación

Gio: es para la meta es para el gobierno, para saber dónde son las áreas más inexplicables y para tener la comunidad como.

Juan: Ah saber por dónde me puedo mover. Sí, sí, sí, sí, sí, me gustaría.

Gio: Y crees que otros miembros de la unidad estarían esfuerzos a participar en la ato usando project sidewalk

Juan: Sí.

Gio: Conoces a como hay un grupo? Hay un grupo que tienen discapacidad o trabajan con personas que con discapacidad, que nosotros podemos, como contactar

Juan: Si si, Conozco grupos, eh? O fundaciones que que que podrían o sea, fundaciones de personas que trabajan con personas con discapacidad.

Gio: Actualmente hay siete categorías de obstáculos en las aceras. Incluye faltantes y de la superficie. Estamos considerando agregar otra categoría para. Eh, entras, entras a garajes porque nosotros, eh, estamos haciendo observaciones y vean que hay un problema en las asedas con los hinchas de los garajes so a veces hay causan problemas en la superficie o hay un obstáculo es un diferencia en altura Entre sí, diferencia. Sí, sí. Si crees que es una categoría que podemos hacer en cuenca?

Juan: Sí, sí, se puede hacer este donde está, eh? Porque creo que ahí, como dice en la altura, es bien grande. Las las la ja pasó, son sub, así, así es imposible de pasar por él.

Gio: Tú puedes mandar a los contactos de los tipos que conocen.

Juan: Sí.

Gio: porque nosotros estamos trabajando con una universidad para tener estudiantes para revisar y usar en clases como tarea. O usar con horas de servicio de quen, pueden hacer un recount en la habitación y puede, bueno, cuántos miles vin o cuántos dedos ponen, eh,

Juan: ¿Qué tipo de discapacidad? visual tal vez también.

Gio: Sí, puede ser algunos de dos tipo. Pero la aplicación es para, es enfoque de personas con eh, discapacidades físicas

Juan: ya te pasó ahorita el número de alguien que es. Tienen ellos una fundación porque su hijo tiene una discapacidad bien fuerte. Oh, tiene parálisis cerebral Entonces el hijo igual, ellos van a todo lado con y tienen una fundación donde llega más gente con discapacidades. Entonces te pasa un número de ella? Sí, sí, sí.

Juan: Le dices que igual que yo te di el nombre.Ya Marcela casas

Gachau: eso fueron nosotros preguntas pero sí tienes algo para decir te puedes

Juan: Ustedes van a pasar este proyecto a EMOV.

Gio: Sí, sí, estamos trabajando con EMOV

Juan: Están trabajando solo en el tema de de infraestructura o también en el tema de la gente como, cómo vea tema de discapacidad?

Gio: Es más de la infraestructura pero sé que es un problema en acuerdo con personas, la mente y

Juan: Que no hay luz. Empatía, los medios de transporte, la empatía.

Gio: Sí, nosotros tuvimos entrevistas con profesoras y ellos también dijeron lo misma cosa que es la cultura es un gran problema.
Juan: Si ese es igual de fuerte que la infraestructura la con ya eso, a ver qué podría ser, si es que van a ver el tema podría hacer poner como ejemplo, por ejemplo, las calles en nueva york Las veredas casi no hay bordes, son bordes. La vereda se va y se va inclinando con Cuántos eran unos tres grados de inclinación que es poquito? Sí, hasta llegar a la calle. Entonces las personas que estamos en silla podemos cruzar sí de calle a calle, eh? Con total este independencia. O sea, sin problemas.
Sí, aquí no. Aquí la el la veredes este alto y de viene un borde. Así es difícil.

Gio: Sí. Los profesores También dijeron que es un problema con los trabajadores que hacen nuestras porque si ellos saben que necesitan hacer un rap, pero hacen lo muy mal y no tienen no, no como la ram antes de les puedo aconsejar también que este proyecto hablar cuál era su.

Juan: Ah, que es el nombre de profesor?

Gio: Orellana es el nombre

Juan: no, no. Nombre de Orellana.

Sam: Daniel.

Juan: Si, Daniel. Él sabe muchísimo de esto. Oh, sí, muchos vimos en mucho. Sí, es muy bueno. Sí, ahora muy bien. Entonces ustedes pueden dirigir este proyecto hacia el municipio que son los que hacen todas las obras su hacia el área de planificación, porque ellos tienen que planificar con ciertos criterios de accesibilidad. Entonces se puede dirigir este tipo de proyectos. El área de planificación del municipio. Y pues él les puede ayudar porque tiene, creo que alguna conexión con él pueden acercarse a hacia hacia el municipio con él.

Gio: Y eso es todo ya. Gracias por todo.

Juan: Gracias a ustedes.

Vivianna Corderra

Interview Transcription
Viviana Corderra Interview
March 29th, 2023 from 9:00-10:00 a.m. on Google Meets

Gachau: What is your job title and experience with infrastructure and/or accessibility? And a further question is, can you tell us more about your research that you've done in this field?

Viviana: My name is Viviana Corderra. I am the partner and founder of a program consultancy called Huasipichanga. I'm gonna send it. But basically at Huasipichanga we give consultancy to create better, inclusive, playful cities. We have an expertise especially on children for the cities, but in general, I think we really were interested in co-creating with the community in order to create changes in the short and long term. I am actually a lawyer, but I have worked in the urban planning field for 10 years now. And at the beginning, I worked more on placemaking and a program in public spaces, and then I did a masters in urban management and development. Currently I'm doing research also focused on child friendliness. My job focuses more on the private policy side, but also on assessing how accessible it is, for children to go around, but also how the field environment really affects them in their daily lives and in their development and also gets their families and their connections. So to tell a little bit of that and I would also say that you take the children's needs as a basis of an indicator. If staying in the city is good for children, then most likely it's gonna be good for everyone.

Gachau: So the next question is, how long have you lived in Cuenca or the surrounding area?

Viviana: I was born in Cuenca, and I lived there until I was 25 when I moved here, 25 years. And I go every year for at least four months.

Gachau: Our next set question is, currently, what is the city of Cuenca doing well to address accessibility concerns? If you can answer that from your point of view.

Viviana: Well, I would say that one of the best projects is in terms of the bike lanes. I don't know if that's necessarily accessibility because only people that can bike can use them. But I also think, for instance, the tram is really good because people with disabilities or people that have a hard time moving around now can access public transportation. I don't know if you've seen, but the buses are really not that friendly for wheelchairs or anyone with some problems, just big stairs and all. So I think at least we are not fully connected, but the tram and bike lanes and making it more walkable are helping this.

Gachau: Another follow up question is, in what ways could the city improve its approach to accessibility?

Viviana: We're talking about infrastructure in general, right? I think changing the mobility system from a car-oriented system slowly towards active mobility. I think Cuenca is also doing it way faster than other cities in Ecuador, and probably the way it's planned, helps them. In terms of land use, I think every time the Northerners of the city are in a way formalized or extended. That is not properly planned because then the the services of mobility are not really reaching every area. So I think what has happened so far and, and how they're approaching mobility in the city center and the main area of the city is great, but that needs to keep happening in a way. And the other thing that maybe it's interesting with me is that they have lately put a lot of focus on public spaces and the playground. This is very important because they've offered playgrounds in new areas. Before, children, for example, couldn't access playgrounds. I think proximity is very important. I don't know how much the municipality is taking proximity fully into account or if it's just bringing up the city or making more spaces for children. But from an outsider perspective, I can say that it is impacting.

Gachau: From your perspective, what's Cuenca's worst situation with respect to accessibility?

Viviana: Definitely the state of the sidewalks. A lot of neighborhoods still don't have sidewalks, or they are really in a bad state, or they are used by cars also, or cars go from the sidewalk or the parking lot allows the car to still be a little bit out. And, for example, you have a lot of electricity poles in the middle of the sidewalk. So you have a sidewalk, but if you're in a wheelchair or with a stroller, things like that, you cannot pass. For example, the sidewalks in the city sector, the material is terrible. Every time that it rains, people fall, it really doesn't make sense. Also, if you want to go from the river up to the city center, you need to go through stairs. So there are huge chunks of the city or the neighborhoods that you couldn't access walking or with a wheelchair. So the worst scenario is daily living and if we think about proximity in neighborhoods and so on. But of course I think also the bosses, it's still a problem, like if you live very far. Cuenca is not yet a city where you cannot access housing. The city center, for example. I think we are in a good position in terms of that, but there's still some inequality.

Gachau: So our next question is, from your perspective, what kind of resources are available and most important for addressing these accessibility challenges?

Viviana: I think the government aspect is the most important in Cuenca. We have a long story of good planning and we can have it like that. But the thing is that we have strong institutions in the municipality. EMOV is relatively new, but quite strong. And I think they have the economic resources to execute, but also the human resources and they have people with a lot of technical capacity to implement. And this is something that in other cities in Ecuador doesn't happen. Like really you have very strong teams and teams that bring in the capacity to build in terms of these areas in Cuenca. The other thing is that we have a Plan of Mobility from 2015. It's very holistic, very complete, and quite progressive in terms of where we want to see the city, which is not power oriented again, but human-centered. It was not legally approved by the city council, but it is a document that the mobility areas still use and it's a great resource. And the third thing I want to say is we have a local law, an ordinance for active mobility that was approved, I'm not mistaken, four years ago, five years ago. And in this ordinance I think also a lot of the finances from the municipality that previously went to increase the car-oriented aspects now go to active mobility. So I think having that legal institution is really important for the city to be able to make the changes. I know they also have a committee that includes citizens and people in academia and technical areas that even have a budget to make certain decisions. Although in practice it isn't necessarily going that well, I think. But at least they have these. I would say those resources are great. And in terms of the city itself, I think there is still a lot of nature, there is already good infrastructure that can be used and, in a way also it's more about, at least in the city center, it is more about changing the culture than having big investment infrastructure. Like they need more investment in participation, making people aware of benefits of active mobility then for instance, having big infrastructure.

Gachau: Considering your experience in this field and what you've told us, were there previous attempts in Cuenca to improve accessibility in the past? If so, what were they? What was the outcome or were they successful or not?

Viviana: To be honest, I'm not sure whether there is a project or anything very specific on accessibility. There's nothing I can remember, like a specific project.

Gachau: The next question is, what do you think are the first necessary steps to make progress in addressing accessibility?

Viviana: I think those first steps are happening, because as I said, maybe the main goal or the main agenda has not been accessibility, but has been something other, in terms of mobility. But as an impact, I think they have improved accessibility, for example, through the tram implementation. But I think one first step would be to really map the city's accessibility to certain criteria. I don't think there's any assessment or baseline of where we're at in terms of accessibility, maybe in public transportation, as I said. Maybe they have some studies that say buses are not accessible for everyone, or things like that. In terms of the policy or in terms of

walkability. I think a good first step would be to really assess where we are at. I'm not sure if that already exists.

Cambria: That's what Project Sidewalk is, the software that we're trying to implement.

*Gio explains Project Sidewalk”

Gachau: Part of our project is to try to get community engagement because we need people to also help us audit the streets here. Because we're only here for five more weeks. So one of the ways we're looking at is university students as one of our possible target populations. So do you have any ideas to get students at universities to help us map out Cuenca using Project Sidewalk?

Viviana: I think the best thing to do is to go to the student federations. Every faculty and every career, let's say, has a president that represents all the students. If you can find that person they can really help you find out some people that help you. And they can also help you navigate with the university's authorities. Sometimes when you go directly to the University Authority, it's hard for them to approve a project or something like that. But if you go to the students, and specifically to those leadership positions, they are able to talk about both sides, right? In most of the universities, in order for you to graduate you need to comply with a certain amount of hours of community service or some sort of a practical project. Maybe if you can find through the federation some students that are interested, then they can help you with the project.

Gachau: Okay, thank you. Our next follow up question is, is there anything else that our team should keep in mind when we're beginning to implement Project Sidewalk in Cuenca?

Viviana: I think there are two very important things. One is to take a gender focus. I don't know, but especially in Latin America, I think the difference is everywhere, but especially in Latin America, the difference of the way that men and women move, it's very, very diverse. There is research, not specifically for Cuenca, but in Latin America, that women move around six times a day. They have shorter trips, but they have bigger accessibility problems because they have children that they have to carry or they take care of the elderly or people in wheelchairs or people with harder mobility challenges. I know people that really have some harder times just moving around, you know? If you can collect the data of women, then you'll see a huge difference. And maybe that really allows you to get some very specific solutions. And the other thing that you can take into account is really to ask children. If you just walk around the day with your children, they can tell you things that the others can never tell. And it's very interesting, really to understand their perspective. And then they tell you things about the adults, as well, but the adults just forget to reassure and things like that. If you ask a child, “how do you walk to the playground?”, they won't only say, “well, this sidewalk is super high and, for me, I have to jump while an adult can just walk.” Right? But they can also tell you things not about infrastructure, but about what facilities really allow them to access that place. For example, they cannot go out alone, so they need an adult. And normally, let's say their grandmas are in charge of very small

children, so they're like, “no, if my dad is here, we can go to the playground. But if I'm only with my grandma, we can't because there is not a bench for her to sit, so we just don't go”. So maybe the accessibility doesn't depend on walking around this city, but on putting a bench on that side of the park. So I think if you can look from the children's perspective and from the gender perspective, you'll get new, very interesting data. And now if you go with the university students, normally they're very mobile and they don't have difficult disabilities and they're young. So I mean, they can help you gather data, of course, but, I think it's really good for them to have the capacity to understand the empathy of all the targets. I would say that, and in terms of child friendliness, I think maybe I can send you some information, but I would really encourage you to look at the city and the sidewalks from their height. So maybe you just go down one meter, you will see completely different things. It's harder to go down the sidewalks and, for instance, the cars are really more dangerous. You're super small and at one meter it's normally like they are three, five years old. But it's also normally the height you will see from a wheelchair. So, navigating the city from that height will also give a very different perspective, because from our height, maybe we don’t see those barriers.

Gio: Actually, on Friday we're going to do a kind of practical.

Gachau: We'll be moving through the city in wheelchairs. We’ll be trying to see the point of view of people with mobility or vision impairments in how they move around the city and get a better, deeper understanding of that.

Viviana: In the university of Azuay, in the faculty of education philosophy, they always go around blindfolded, but they don't really assess the space as much. I think they do it more for a different perspective in-person. They're gonna be either social workers or caregivers, things like that. But they're the only ones who actually do it. So it'll be cool to have something, some exercise like that for the people from architecture all together. I don't know. You can also do it yourselves, of course, but I think you can also try to find them. They normally go around as well to see how it is for someone with a vision impairment.

Gachau: Okay. So for our last question, do you know anyone else that we can talk to about this to get more insight? It could be people with disabilities or experts in the field of accessibility. We're still trying to network and get the whole scope of this issue here in Cuenca. Do you know anyone else that we can talk to about this?

Viviana: I'm thinking. Maybe Mateo Coello. He's also a professor at the University of Azuay. I can tell you his email. I have to check, but I could. And I also know one person who works with people with disabilities. I'm not sure they're an expert on city planning or infrastructure.

Gio: Or maybe someone that can just give us more insight on how to engage the community, even that would be helpful.

Viviana: Yeah I can send you a couple of contacts.

Gachau: That would be very helpful. Thank you. That's all our questions for today. Do you have any other comments or anything we should keep in mind moving forward with this?

Viviana: We are going to start a project with young people also to understand safety around the city. And I think this would be a really cool thing for them to use because normally they do relate safety a lot with the severity of mobility of course. But, I don't think that we'll be on time with your timeline.

Gio: We can let you know once the server is up.

Viviana: That's very cool because I think if we, in our project, can see the data, then it'll be great. I mean, at any point to have just more data and use the same software and just build on

Marce Gutierrez

Interview Transcription
Marce Gutierrez Interview
April 10th, 2023 from 4:00-5:00 p.m. at HOPE

Sam: ¿Cuánto hace que vives en Cuenca?

Marce: 42 años

Sam: ¿Cuál es su título de trabajo y experiencia con accesibilidad?

Marce: Mi título profesional, yo soy megiste de orientación educativa familiar.

Gio: Y qué es esto?

Marce: Megiste es una educativa familiar quiere decir que una trabaja con familias de personas con discapacidad y que no tienen discapacidad en problemas familiares o a lo mejor problemas y trastornos conductuales también.

Gio: ¿Cómo te mueves normalmente por Cuenca?

Marce: En Cuenca, camino. En el carro de mi esposo.

Gio: ¿Con qué frecuencia recorre las calles de Cuenca como peatón (es decir, no en automóvil, autobús, bicicleta, etc.)?

Marce: Una vez a la semana. Normalmente el fin de semana nos conocimos.

Gio: ¿Alguna vez ha tenido problemas con la uniformidad de la acera, agujeros en la acera, obstrucciones o el ancho de las aceras? ¿Puede darnos un ejemplo de lo que sucedió?

Marce: En el centro histórico, en El Centro de Cuenca, hay los adoquines y una silla de ruedas, yo tengo mi hijo tiene discapacidad. Entonces, tenemos una silla de ruedas grande y las calles son adoquinadas y se van aquí. Por ejemplo, los adoquines van a tocándose la llanta, o sea, se quedan atascados los dientes. No hay coco y en las veredas en las aceras es difícil porque hay postes. Entonces esos postes quedan de espacio pequeño. Entonces no da la silla de rueda le voy a indicar. Entonces es difícil en El Centro histórico caminar y llevar la silla de ruedas cuando uno está de prisa. Ya cuando uno va con tiempo, o sea, está bien. O sea como que uno se toma el tiempo, pero, generalmente las familias de aquí de la fundación no suelen frecuentar El Centro.

Gio: En los semáforos, ¿siente que tiene suficiente tiempo para cruzar la calle de manera segura? ¿Desearía que el semáforo para peatones durará más?

Marce: No, está bien, porque si durara para pegar todo es más para un caos con los automóviles, o sea, hubiera mucha congestión. Nosotros como peatones deberíamos. Estar en el tiempo necesario para cruzar en ese tiempo que dure el semáforo. Pero si vemos que ya se está poniendo alabar y queremos cruzar, o sea imposible, tengo que quedarme parada y luego esperar que nuevamente se ponga semáforo ya no con ese o sea, estaría la idea.

Gio: ¿Estaría dispuesto a utilizar Project Sidewalk para revisar virtualmente las calles de Cuenca e identificar áreas inaccesibles?

Marce: Sí pudiéramos utilizarla. Sí, es importantísimo, sobre todo, por ejemplo, el día viernes anterior, nos fuimos a la universidad de Cuenca con las boyas y la sillas de ruedas ya entonces hubo sensibilidad y todo. de ahí salimos del centro histórico, hacer una una ruta en el bus de dos pisos con los wawas con discapacidad. Entonces, claro, al cruzar la universidad de Cuenca, la calle es ya de adoquín, pero como hay las escalinatas, lo cierto, entonces uno, no hay como, por las wawas están en sillas ruedas subir. Entonces me tomé el tiempo para ir con el río tome va. Pero como están los árboles. Le han levantado el pavimento las raíces, o sea, están altas. Entonces nos tocaba esquivar, bajamos a la calle pasan los autos otra vez subimos a la acera nuevamente. Entonces eso es un problema, por ejemplo, que no hay accesibilidad y nos tocó primera vez que pasábamos por ahí la silla de ruedas de realidad. Entonces, ya con esto se podría decir me voy a tal lugar. Y con esta aplicación se podría decir voy a ver si es que hay accesibilidad antes del programa.

Cambria: Sí. La semana pasada nosotros hicimos una simulación con silla de rueda. Era muy difícil. con la municipalidad de cuenca. Sí, sí, sí.

Ya está lalo porque ver, aprende de aquí y hay a veces estas tapas de aquí. Estas tapas están levantadas. Se choca. Entonces los wawas asustan, obviamente, porque es como que si fueran a salir de la silla.

Gio: Y las rampas no son al mismo nivel.

Usted va a la silla y se choca.

Nuestro compañero se cayó en la silla cuando estaba tratando de ir en una rampa.

Ya es peligroso. Sí. Entonces yo, lo que suelo hacer, por ejemplo, con mi hijo, las ruedas de adelante son pequeñas, las pequeñas ruedas. Entonces chocan. Entonces yo suelo girar y con ruedas de atrás, le levantó para subir. Sí, hay que girar.

Gio: Crees que otros miembros de la comunidad estarían dispuestos a participar en la auditoría usando Project Sidewalk?

Sí. O sea, nosotros estamos dispuestos de no hecha mostrar entrar el participar en todo lo que sea para bienestar de los wawas. Entonces, mira, aquí está. Entonces son estas sillas grandes. Sí. Y entonces estas pequeñas ruedas chocan aquí siempre, siempre. Entonces, por eso hay que girarles y derecho ir les ubicando. Entonces siempre estamos saliendo aquí. Una madre de familia mandó poner 10 ruedas. No hay como igual choco. Entonces esta no la grande es la ideal para subir. Si no se chocan. Nosotros hemos salido en realidad nos gusta mucho salir con los wawas ahora mismo de le he move. Hacemos el ciclo, pase, hacemos una cicleada con los niños con discapacidad, pero también donde esos ciclo días hay piedra hay a veces ramas es te tocas tarde haciendo un lado y todo para poder.

Gio: En su opinión, ¿cómo podemos involucrar a la comunidad para que participe en la auditoría de calles a través del Proyecto Acera?

Cómo nos podemos involucrar, por ejemplo, es seria con salidas. Salidas de creativas, salida de conocimiento con los familiares. Entonces, por ejemplo, la fundación planea, este mes el ciclo a paseo, la cicleada. se llama mountain bike. Entonces hay programamos de esta ciada vamos a ver si. Ahí ustedes pueden ir captando cuales son los obstáculos en el camino en el trayecto. Entonces ahí sería importantísimo involucrarnos porque obviamente hay esta aplicación y todo. Y si no se la uso porque la gente no sale en cambio, nosotros como estos pacientes con discapacidad. Siempre estamos motivando una vez al mes a salir fuera de la institución. Porque a veces las familias en casa les tienen en la casa en las cuatro paredes. No salen mucho. Sobre todo, ya cuando son grandes. Porque ya mamá, papá, ya son mayores. No tienen como salir. Cada peso de un niño o de un joven con discapacidades. Es pesado, muy pesado. Entonces, obviamente no pueden salir.

Gio: Es bueno, porque no tienes que salir. Tú puedes hacer toda esa en su casa. Si tienes una computadora con internet, puedes usarlo. Porque estás en la ciudad en Google Street View. Sobre todo es virtualmente.

No puedo salir, si yo voy a la aplicación y veo si tiene accesibilidad lo que yo suelo hacer con mi esposo y mi familia. Entonces llamó al lugar donde va a comer. Entonces “hay accesibilidad?. Me dice sí o no hay gradas. Cuántas gradas son?” Si me dice que es gradas o cuatro, vamos a pero si ya me dicen 10 grado muy difícil porque es muy pesado.

Gio: Puedes promocionar la aplicación aquí porque es para personas con discapacidades. Y creo que puede ser muy beneficioso para personas familiares.

Marce: Si, una se puede promocionar. Aquí tenemos 38 pacientes que tienen discapacidad y otros tienen dificultades de aprendizaje. Entonces se puede difundir desde nuestra comunidad a diferentes entornos comunitarios, escuelas, colegios y todo así.

Cambria: Todo es en español, también.

Gio: Hay un tutorial. Las personas pueden aprender cómo usar la aplicación y cómo hacer los labels y cosas. Es muy fácil para aprender.

Cambria: El éxito de esta aplicación depende de cuántas personas ayudan a auditar las calles?

Gio: Eso se está utilizando en México en dos ciudades. Y en una ciudad, en un año, ellos, auditen 200 millas de las aceras de la ciudad en un año. Sí, porque las personas, la comunidad fue involucrada en la aplicación si es muy importante.

Marce: Mire, a veces hay este tipo de acerca. Entonces, bueno, ella le puse pero a mi hijo le gusta porque se ríe. Te encanta la vibración. Lo malo es que a veces esas ruedas se quedan atrapadas y es difícil de sacarlo. Y son muchas eh, a veces, bueno, nosotros no con mi esposo siempre salimos de realidad para poder. Dar uso a estas rampas. Y todo lo malo es que a veces no hay esa conciencia social de las personas que tienen auto y se estacionan en la rampas.

Entonces nos toca salir los a la acera a la ver a laca a la calle para que pase los autos, sus carros y poder subir nosotros es medio complicado.

Pero yo pienso que con esta aplicación nos diría muy bien, porque a nosotros que nos gusta salir, obviamente. Nos va beneficiar, sobre todo en el tema de la accesibilidad, en el tema del tiempo hasta para poderlos estacionar.

Gio: Sí, sí. En el pasado en otras ciudades. Organizaron se llama mapatones y ofrecen crédito de servicio comunitario o parecer como aquí, para no se….para divertirse. Y creo que esos métodos son efectivos.

Marce: Sí, yo pienso que haciendo unas actividades desde crea diversión en familia, se puede ganar. Osea, se puede concienciar a la gente ahí y poner so flash visual que hay esta aplicación que utilicen y todo así.

Cambria: Si queremos organizar aquí en Cuenca un evento como un mapaton, nosotros hablamos con profesores de la Universidad de Azuay para empezar un evento. Piensas que personas aquí para ayudarnos en ese evento o si quieres ayudarnos?

Marce: Claro en el evento de para ser como una telephone para con fondos, es como fondos económicos o para fondos de socialización de socializar el proyecto.

Gio: Si, para socializar y para….

Cambria: Auditar los calles.

Gio: Sí, sí, y en el evento las personas trajes con sus computadoras. Es como por un hora o cualquier cosa..

Marce: Y cómo podríamos participar nosotros en el caso que sí, nosotros estuviésemos dispuestos a participar? ¿Qué tenemos que hacer?

Sam: Ah, cuando usan sus computadoras.

Gio: Sí, solamente usar sus computadoras. Nosotros quedamos la persona que está. Ah, trabajando en evento para enseñar como lo usan la actuación y puede ser como incentivos. No se estamos en lo primer parte de el organizador del evento.

Marce: Así que así, si nosotros podemos igual apoyar en esta socialización.

Gio: Y la última pregunta. ¿Conoces a alguien con quien podamos hablar para obtener más información sobre este tema?

Marce: Sobre este tema de incluso de pronto catia ella tiene una fundación de personas con discapacidad. Catire es de es ávila. Ella es algo de la. Los consejos de participativos o algo así del municipio Katia. Si le conocen a catia vida.

Sam: ¿Cómo se llama?

Marce: No, ella es de participación en los consejos de discapacidad. Sí, Katia, yo ya le doy en contrato el número de y también tengo otra persona que es de me parece que es. De no algo así. Voy a ver personas seguidas que no tienen. Quería mostrarle. No sé si ya descargue las fotos. ¿Hay fotos que tenía de hasta cuándo van a estar o cuándo es cuánto dure el proyecto?

Gio: Nosotros ya hasta aquí en Cuenca hasta Mayo tres, el tres de Mayo. Y estuvimos aquí hasta un mes sí, dos meses en total. Estamos aquí.

Marce: Y entonces nosotros, eh, sabemos hacer esta sí que ah, con las sillas, entonces ahora este mes nos toca. Ah, la ci decía de ruedas y hacemos desde el hospital más o menos cinco kilómetros. Cinco kilómetros con las con las vici y toda la comunidad ahí. A veces que tan pequeños son grandes. Ah, entonces aquí están y hasta estemas es en este mes.

Gio: Este mes?

Marce: Sí.

Gio: ¿Qué día?

Marce: Un sábado es un sábado, un domingo que planeamos estamos aquí. Esta bici se trajeron de Estados Unidos. Está porque aquí no hay para la niña que no puede caminar. Sí, sí, aquí no hay esas, acá hay esas. Vi toscos. Estos de acá, por ejemplo, que son inclusives también para niños que no pueden caminar. Y aquí creo que están saliendo. El no.

Marce shows the group a video

Marce: Los discapacidad y y así somos, hacemos eventos, como les digo, es importantísimo que la familia se involucra y que salga y y podamos disfrutar así sí mismo de las calles del centro histórico de todo lo que nos ofrece Cuencanos. Sí, le manda un qué? Qué número les mando el teléfono de sam se.

Continues playing the video again

Marce: Ahí está esa montaña.Voy a poner esa manta. Estudiante de que co es el proyecto. Voy a poner sí, sí. Y de qué parte son ustedes de estados unidos?

Gio: Ah, estamos en una escuela en Massachusetts. Sí, pero yo vivo en Nueva York.

Sam: Soy de Connecticut…es cerca de Nueva York.

Ilana: También, cerca de Nueva York.

Cambria: Yo vivo en Nueva Hampshire.

Marce: Sí, es cuál es especialidad o lo que están siguiendo.

Gio: Yo soy un ingeniero civil.

Sam: Estudio psicológica y los negocios

Ilana: Yo estudio las ciencias de computación

Cambria: Yo estudio robótica.

Marce: Ahora en ecuador hay mucho de robóticas. Si, ahora desde hace dos, tres años más o menos están dando ya estas materias de aquí en las universidades.

Gio: Ah, pero esas fueron todas esas preguntas que nosotros qué tenemos.

Marce: Bueno, espero a haber les podido ayudar en todo caso. Y cualquier cosa que necesiten igual me llaman me manda un mensajito y para gracias.

Everyone: Gracias!

Lesly Garacochea

Interview Transcription
Lesly Garacochea Interview
April 18th, 2023 from 3:00-3:30 p.m. at UCuenca Library

Gio: Cuánto hace que vives en cuenca

Lesly: 21 años.

Gio: Cómo te mueves normalmente

Lesly: en bus

Gio: y con qué frecuencia las calles de cuenca con mucha frecuencia. Cuántos

Lesly: mucha frecuencia

Gio: y alguna vez ha tenido problemas con la acera?

Lesly: No, no.

Gio: Alguna vez ha tenido problemas con la uniformidad de la acera

Lesly: No

Gio: Conoces a alguien que experimentó desafíos más bien,

Lesly: no, no, nadie, nadie.

Gio: ¿Siente que tiene suficiente tiempo para cruzar la calle de manera segura?

Lesly: No, no

Gio: y por qué?

Lesly: Muy rápido, muy rápido.

Gio: estaría dispuesto a utilizar nuestra aplicación para revisar virtualmente las calles de cuenca e identificar áreas inaccesibles ?

Lesly: Sí. Sí, pero quisiera saber como funciona.

Gio: Si yo puedo mostrar.

Shows Project Sidewalk and explains how it works

Gio: La última en su opinión, cómo podemos involucrar la comunidad para que participe en la aplicación?En el pasado otras ciudades organizaron Mapathons por ofrecieron crédito de servicio comunitario. ¿Parecen estos métodos son efectivos?

Lesly: No puedo pensar, creo que si este método es bueno.

Gio: Y eso es todo. Gracias por tomar el tiempo para hacer la entrevista

Guilherme Chaloub

Interview Transcription
Guilherme Chaloub
April 19th, 2023 from 10:00-10:30 a.m. at EMOV EP

Gachau: How long have you lived in Quinco or the surrounding areas?

Gui: Four and a half years. Four and a half years. I can do it.

Cambria: What is your main mode of transportation?

Gui: Bicycle.

Gachau: What have you noticed about pedestrians and sidewalks while biking or while you're traveling through the city?

Gui: Sometimes I go on the sidewalk when I shouldn't, on a bike, or I also walk a lot, and I see usually bad infrastructure regarding size and condition of the sidewalk. Also the match between the crosswalks and the ramps, where, when they exist. Sometimes it's not well-matched. So there are real deficiencies in the infrastructure in general.

Gachau: So who makes the changes in the sidewalk? Like who's, who's responsible for that? Like, whose job is that?

Gui: Okay. This is complex and I briefly explained it to you guys. The planning department from the municipality does the general design of the sidewalks. Public works are the ones who build it. And once it's built or when it's being built, they send it to the mobility planning department who do the signing with the vertical signs and the horizontal ones. So if it's going to be restricted parking, if there is going to be a crosswalk, or anything like this. And they send this planning EMOV who is the one who implements this signing. So a lot of actors interact with it.

Gachau: And so then our next question would be like, how does policy change go from being an idea to being implemented? Like what's the pipeline or like what's the process of that for a policy? For policies?

Gui: Um, general policy meaning bills or laws.

Cambria: Yes.

Gui: Any bill law project is done through the commission of Mobility, which is a part of the city council, which is discussed technically. It is afterwards socialized with the citizenships, with the stakeholders, which the law is being directed to. And once this is polished, it's sent to the council. The council will have a first debate where all the 15 council members will discuss and change the proposal. There can be a 16th chair where a citizen can discuss with the same weight as a council member. They will debate and change this proposal of law and this counts as the first debate. This will then come back to the Mobility Commission, where there's just three council members. They will discuss it with the technical teams from EMOV, from the mobility, planning department, any other, any other actor that's also involved. They will improve it based on the observations from the first debate. And once they are done, they could, again, socialize it if it's needed to, or, if it's just ready, they will be sent again to the council for the second debate. This is usually a process that will take months, if not, a year from the conceptualization, the design, the first debates, the socialization process, the going back and forth.

Gachau: How will EMOV use the data collected through Project Sidewalk?

Gui: My main idea is first creating consciousness on how our sidewalks are in general. So, we would most likely make videos, communication pieces so we can diffuse the information for the

citizenships and create awareness and also, so they can also be the ones that demand sidewalks for us. We have tons of critics in the networks, in the social media, and they are usually about, there's a pothole and the traffic signal is not working. Again, it is the ones who have cars, which are a minority, that are the ones who do the complaint and not the majority of people walk. This is a lack of awareness and so people should know their rights the same way they should ask us to fix a pothole, they should ask us to fix their sidewalks. A second use will be to send to the planning department and the mobility planning department the ones who can intervene and conceptualize a plan for an intervention, a physical intervention. They can rephrase their proposals and also start building new proposals, which address a much wider point of view from what they have right now.

Gachau: After our group leaves Cuenca in May, how can EMOV continue utilizing Project Sidewalk?

Gui: We should discuss and address how to scale the project. I most likely do not have the resources to implement it myself. So there are some options. One, the one that we discussed, and we will go a little bit deeper on Friday, seeing if the universities could help us to, to scale up the project and do the mapping. Option two, I could verify if I have the budget to do it myself. Hiring people or a consultancy or something like this mapping.

Gachau: How can EMOV promote this project or the software Project Sidewalk?

Gui: We can promote through social media, most likely. But again, for the complexity that you've seen and discussed, I think it's not that simple that any one individual will start doing it and start doing it well. There should be some training involved. So this is complicated. So another thing, talk with the institutes that work with disabilities and try to capacitate them to do also the mapping, at least in their surroundings. So, also important for you guys as a product, that you leave us these guidelines of how to do the training, not based on Los Angeles, but based on Cuenca, how in Cuenca we should use it, which things we should be aware of, which are not evident. It's not at least well established in the base tutorial, and for here it's a big difference.
Cambria: As an additional question, like what do you want us to leave you with when we go, like, we are thinking of making a video like you mentioned showing how to you use Project Sidewalk in Cuenca specifically, but is there anything you specifically want from us when we leave as a deliverable?

Gui: For me, the most important deliverable would be two. First, again, this analysis of representativeness. Some strategy on how to scale the project from a technical point of view. And the second one, from an operative point of view, again, at least have designed some ways of how to scale the project from an operative point of view. Again, you cannot influence it on the budget perspective or something like this, but with the context of the institutes and the universities to have already had this first reach and to see there’s these universities, there’s these institutes, there is this tutorial. You could just reach them now. We’ve reached these ones.

There's these whole ones we cannot, we will not have the time. But, there is this whole possibility of soft networking that should be evaluated to see if you are going to scale up this project through that.