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# Pedestrian Safety: Crossing Language Barriers

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Pedestrian Safety: Crossing Language Barriers

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#### Abstract

The prevalence of accidental injuries among pedestrians in Monterey County has reached alarming levels, highlighting an urgent need for intervention to mitigate this issue. The contributing factors leading to this issue are the lack of infrastructure, lack of pedestrian education and language barriers. This significantly enhances the likelihood of a pedestrian being exposed to injuries, human suffering, and death. The County of Monterey Public Health Department has been granted funds by the California Office of Traffic Safety in an effort to implement initiatives aimed at reducing pedestrian-related accidents, injuries, and fatalities in Greenfield California. This project focused on developing a pedestrian safety script tailored for the Triqui language, prevalent among the population of focus. This script was successfully incorporated as a voiceover for a video demonstrating effective measures to mitigate pedestrian injuries. A recommendation to the County of Monterey Public Health Department would be to broaden their outreach efforts by extending initiatives to diverse populations. This involves translating the pedestrian safety script into additional indigenous languages to ensure accessibility and inclusivity across communities.

Keyword: Pedestrian safety, Monterey County, Triqui language, Pedestrian.

#### **Agency and Community Description**

#### **Agency Description**

The County of Monterey Public Health Department was established in 1922, and shortly after that year it began implementing a wide variety of services and programs with the intention of assisting the resident community. One of these programs is the Bicycle and Pedestrian Safety Program, which began its formal operations in the year 1987 (Monterey County, n.d.). This program has two funding sources which are the Office of Traffic Safety (OTS) which was started in 1987 and the Active Transportation Program (ATP) which was started in 2016. The mission of the County of Monterey Health Department is to "enhance, protect and improve the health of the residents of Monterey County" (MCH, 2024, para. 1).

The Injury Prevention team undertakes a variety of initiatives aimed at improving conditions for cyclists and pedestrians throughout the county. To achieve its goal, the program provides a number of services to the community to educate individuals about pedestrian and cycling safety. These materials include presentations to primary school children, parents, school staff and administration, and the community. In addition, they organize school district and community events. They also build well-marked crosswalks, bike lanes, ADA ramps, and sidewalks with the city and department of public works.

#### **Community Served**

Table 1 in Appendix A, presents a demographic profile of the City of Greenfield using the Census American Community Survey 5-year estimates (U.S. Census Bureau, 2021). According to the census, The County of Monterey is home to 438,953 people and 18,937 residing in the City of Greenfield (US Census Bureau, 2021). About 7,009 of them were 18 years and younger, 11,079 were over the age 21, and 1,448 were 65 years and over. In terms of race and ethnicity, 94.0% of residents in Greenfield identified as Hispanic or Latino, 3.2% identified as non-Latino white, and 6.0% identified as non-Hispanic of other races. The Census reported that 10.9% of families and 20.0% of children under 18 in the City of Greenfield lived on incomes below the poverty line. Another important factor was in the percentage of families that speak English "less than very well," where 42.8% of families in the City of Greenfield don't speak English very well. Finally, in terms of residents 16 years and over within the City of Greenfield commuting for work, about 70.0% drove alone and 11.9% carpooled.

The County of Monterey Public Health Department's Bike and Pedestrian Program promotes and improves bicycling and walking infrastructure, safety, and accessibility across the county. Monterey, Salinas, Carmel, Pacific Grove, and other cities and unincorporated areas are included. Through its projects, the program promotes active transportation, public health, traffic reduction, and community well-being. The City of Greenfield is the project's focus.

#### **Problem Model Background and Literature Review**

#### **Problem Statement**

There are too many pedestrians suffering from accidental injuries in Monterey County. According to the data provided by the California Office of Traffic Safety (CA OTS, n.d.-a). Monterey County placed 9th out of 58 counties in the state of California in terms of the number of automotive accidents that included pedestrians and bicycles in the year 2021. The most vulnerable members of society, including children and the elderly, are disproportionately impacted by this issue. There are a significant number of indigenous immigrants from Oaxaca, Mexico living in the community of Greenfield, California. Many of these immigrants understand very little Spanish and/or English. It was reported in 2011 that Triquis, Mixtees, and various other indigenous groups account for around one third of the town's total population (Wonzniacka, 2011, para. 4). This population is particularly vulnerable to injuries because of the language barrier.

According to the Governors Highway Safety Association Pedestrians since 2010, there has been a 77% increase in the number of pedestrians who have been killed in the United States, while there has been a 25% increase in the overall number of people killed in traffic accidents (Macek, 2023). Pedestrians are at risk when attempting to cross street intersections or standing at a corner while waiting for the crosswalk light to turn on. Pedestrians aren't always visible to drivers, especially those who are operating large vehicles like trucks or buses. People who are traveling on foot or by bicycle do not have the same degree of protection as those who are traveling in automobiles, which include safety measures such as seat belts, air bags, and other similar devices. Because of this, every time they go out on the road, they put themselves in a more vulnerable position. Figure 1, presents the problem model in graphical form.

| Contributing Factors            | Macro Problem                              | Consequences    |
|---------------------------------|--|-----------------|
| Lack of Infrastructure          | There are too many                         | Death           |
| Lack of Pedestrian<br>Education | accidental injuries in<br>Monterey County. | Injuries        |
| Language Barrier                |  | Human Suffering |

| Figure | 1: | Problem | Model |
|--------|----|---------|-------|
|--------|----|---------|-------|

#### **Contributing Factors**

#### Lack of Infrastructure

The considerable lack of infrastructure plays a key role in pedestrian accidents and adds to the high number of pedestrians who sustain injuries. "Pedestrian infrastructure includes sidewalks, trails, crosswalks, and intersection designs. Increased sidewalk coverage, increasing the connectivity of pedestrian walkways, and adequate sidewalk widths are included in this strategy. Street lighting and landscaping are additional micro-scale design elements that facilitate walking"(Street Smart Planning, LLC., n.d., para. 1). In Cogan's article he says, "In 2021, the latest GHSA report says, 60.4 percent of pedestrian fatalities happened on such roads, which often lack infrastructure that would make it safe for pedestrians, such as good lighting and frequent crosswalks" (Cogan, 2023, para. 5). This highlights the important need for pedestrian infrastructure.

In particular, the absence of infrastructure in impoverished neighborhoods has an effect on the people who reside there, making it dangerous for them to go to places like school, jobs, and grocery stores. The article titled "Income Disparities in Street Features that Encourage Walking" presents findings from a research study. "This study shows that people living in low-income communities are less likely to encounter sidewalks, street/sidewalk lighting, marked crosswalks and traffic calming measures such as pedestrian-friendly medians, traffic islands, curb extensions and traffic circles" (Bridging the Gap, 2012, p. 1). Insufficient pedestrian infrastructure in low income and minority communities poses significant challenges for pedestrians. Narrow or poorly maintained sidewalks, inadequate crosswalks, and insufficient lighting increase the risk of accidents and discourage walking as a mode of transportation. In order to address these issues it would require investment in wider sidewalks, well-marked crossings, improved lighting, and traffic calming measures to create safer and more accessible environments for pedestrians, promoting healthier and more sustainable living.

#### Lack of Pedestrian Education

A lack of pedestrian education, which includes basic safety precautions for pedestrians, also plays a role in injuries and fatalities. Before the implementation of a pedestrian safety education program, the injuries involving a pedestrian were higher according to McLaughlin et al. (2019). There were six reported pedestrian-related injuries in intervention school districts in the year prior to the intervention and two injuries in the year after the intervention, resulting in a significantly lower injury incidence. This research proves that pedestrian education on basic safety precautions lowers human injuries.

According to Percer (2019) "...more than half of young children observed crossing streets engage in unsafe street-crossing behavior. Therefore, it is important that children are properly trained in safe pedestrian skills" (Percer, 2019, p. iii). This underscores a concerning reality: a significant proportion of young children exhibit unsafe street-crossing behavior when observed crossing streets. The finding emphasizes the critical importance of providing comprehensive pedestrian safety training to children. Equipping them with the necessary skills and knowledge to navigate roadways safely, can effectively reduce the incidence of pedestrian accidents and injuries among this vulnerable demographic. Investing in pedestrian education programs tailored specifically for children is essential for fostering a culture of safety from a young age and instilling lifelong habits that prioritize pedestrian well-being.

Research conducted in Texas demonstrated the effectiveness of the Safe Routes to School (SRTS) program in reducing pedestrian injuries. The study revealed a significant decrease in pedestrian and bicyclist injuries among children aged five to 19 years (42.5% reduction) and

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adults aged 30 to 64 years (33.0% reduction) following the implementation of SRTS initiatives (DiMaggio et al., 2015). To replicate these positive outcomes, it is recommended that similar tactics be maintained across all cities in Monterey County. This approach can help mitigate pedestrian injuries and promote safer environments for residents of all ages.

#### Language Barrier

Language barriers pose significant challenges for pedestrians navigating unfamiliar environments, particularly in multicultural settings. Signs, instructions, and information about pedestrian signages are not available or accessible in languages other than the dominant language. The article *Hispanic Pedestrian and Bicycle Safety* identified:

Hispanics in [focus] groups see cultural differences as a main potential cause of accidents among Hispanics, and cite major differences in traffic laws and enforcement between Latino countries and the U.S. They report a general lack of education on these issues, and few Spanish language sources of information...Additionally, participants said that new immigrants are particularly in need of such information (Barrera Murphy & Knoblauch, 2004, p. 2).

Furthermore language barriers are a key issue for the United States due to a lack of resources available for the population who may not speak the predominant language. The article *More than Words, Mas que Palabras* presented the following findings:

More than eight percent of the U.S. population does not speak English "very well," according to the Census, while close to 66 million report speaking a language other than English at home. Despite those numbers, language and cultural-specific services are not widely available, particularly for Latinos (The GroundTruth Project, 2024, para. 1).

Language-specific services are limited, making pedestrian navigation difficult for non-English

speakers. Linguistic inclusion and crucial support mechanisms that meet the different linguistic needs of all pedestrians are needed to address this inequality and create safer, more equitable communities.

#### Consequences

#### Injury

Injuries are one of the outcomes that is attributed to the high incidence of automotive accidents involving pedestrians. According to the National Highway Traffic Safety Administration (NTSA), "In 2021...more than 60,000 pedestrians were injured nationwide" (n.d., para. 1). Accidents involving pedestrians often result in severe injuries due to the fragility of the human body and its response to being hit by a motor vehicle. Victims of catastrophic injuries may have short-term and long-term effects as a result of their ordeal. These very trying circumstances may place significant psychological stresses on individuals and their loved ones. Health problems or financial difficulties are two examples of the kinds of hardships someone may face as a result of pedestrian injuries.

In the year 2000, the total cost of all motor vehicle collisions in the United States was 230.6 billion dollars. Lost productivity, medical costs, legal and court costs, emergency services, insurance administration, travel delay, property damage and workplace losses are all included in these costs (Chakravarthy et al., 2007, para. 4). This cost is due in part to the lack of resources available to pedestrians which leads to injuries, which compounds the cost by those negatively affected. The cost of pedestrian injuries, a major component of these costs. To reduce human suffering and economic strain from pedestrian accidents, we must understand their societal impacts and push for pedestrian safety measures.

#### Death

The most tragic result of the alarmingly rising incidence of car accidents involving pedestrians and bicycles is the loss of life. According to a report by KCRA in Sacramento, the Office of Traffic Safety in California reports that pedestrians account for 25.6% of all fatalities that occur due to traffic accidents in the state (Heft, 2022). The statistics from the agency's 2020 data reveal that there were 6,516 pedestrians killed in traffic accidents throughout the nation. This is an increase of approximately 4% from the previous year. The rise in percentages of deaths in pedestrians "are still the same—at least the ones everyone can agree on—dangerous driving, larger and heavier vehicles and inadequate infrastructure," (Vock, 2023, para. 3). Well-known variables continue to cause pedestrians face additional threats. However, the biggest issue is the lack of infrastructure to protect vulnerable road users. Lack of crosswalks, poor sidewalk maintenance, and poor lighting undermine pedestrian safety. A comprehensive plan that involves stricter traffic restrictions, pedestrian education, and infrastructure are needed to address these concerns.

#### Human Suffering

Accidents involving pedestrians often leave victims with long-term physical and mental complications, including chronic pain, traumatic emotional experiences, and disabling conditions like paralysis. These wounds have the potential to have an impact on the victims' quality of life, mental health, and general well-being. In the article *Pedestrian Accidents Cause Long Term Physical and Emotional Challenges* states "more than 120,000 received emergency medical treatment for their accident-related injuries. These victims are forced to endure severe physical harm, along with long-term emotional effects" (Harris Lowry Manton LLP, 2017, para. 1). Pedestrians are not only forced to deal with the effects of their injuries but also face the prospect

of having to bear a financial burden as a direct consequence of the severity of those injuries which then can lead to stress, depression, and anxiety (Piccinelli et al., 1999).

#### **Project Description & Project Justification**

#### **Project Description**

For my capstone project, I created a script and produced an educational video that emphasizes the importance of pedestrian safety. The capstone project centered on the Oaxacan community in Greenfield, California. Collaboration was necessary with an independent interpreter to translate the script into the Triqui Language for a voice-over for the educational video on pedestrian safety. The project also involved meetings to implement the project and a workshop to showcase the educational video. According to the California Office of Traffic Safety (2021), Greenfield has been identified as a city of concern due to its high ranking of 33rd out of 101 cities for pedestrian accidents (CA OTS, 2021). This issue is of great importance as there is a lack of awareness regarding pedestrian safety. This project sought to broaden the reach of pedestrian safety education by producing a video that can be accessed in a different language that is commonly spoken in Greenfield..

#### **Project Justification**

This project's objective is to provide an educational video in the Triqui language for pedestrians, with the unique demographic of Oaxacans in mind. It is important for videos to not only be available in English and Spanish, but also in other languages, as this will ensure that pedestrian initiatives are providing benefits to all demographic groups. Particular focus should be placed on ensuring safe, healthy, and equitable outcomes for all. The implementation of this project is expected to provide positive outcomes for the community, primarily in terms of enhanced learning experiences. United Nations Educational, Scientific and Cultural Organization (UNESCO) research suggests that individuals tend to acquire knowledge more successfully when they have access to educational materials in their native language (UNESCO, 2022). Therefore, translating educational material in an individual's native language is a best practice.

The agency stands to gain many advantages from this project. The use of translation services by the agency illustrates its dedication to fostering inclusion and diversity, hence enhancing its appeal to individuals from diverse linguistic origins and cultural contexts. The showing of a commitment to linguistic diversity by the organization has the potential to enhance community involvement and develop trust. Individuals are more inclined to interact with an organization that demonstrates a commitment to understanding and honoring their linguistic and cultural backgrounds.

#### **Expected Outcomes & Assessment Plan**

The expected outcome for the project was the translation of the pedestrian safety script into the Triqui language, facilitating its use for voice-over narration in a pedestrian safety video. Through the creation of this video, a valuable resource has been developed for the population of focus, enabling them to learn about pedestrian safety practices in a language accessible to them. This initiative not only provides a practical tool for the population to utilize but also fosters inclusivity and engagement by ensuring that vital safety information is available to all members of the community, regardless of language barriers.

To measure the outcome of the project, I met with my mentor and the translator to receive feedback. The project was also presented to the Greenfield Unified School District's community school liaisons. They were asked one open ended question. The question was "How do you think

this project is beneficial". Through this question, I was able to carefully evaluate the project's effectiveness.

#### **Implementation Process**

In March 2023, the implementation of this project commenced. My mentor, Jessica Perez, introduced me to the project idea, and by October 2023, the project had received approval. A script promoting pedestrian safety was developed and then translated into the Triqui language. As part of the project, a pedestrian safety video was developed alongside the translation of the script. The video incorporated the translated script as a voice-over. On October 31, 2023, an initial contact was made with Centro Binacional to establish a connection and obtain a point of contact for the project. Upon receiving a point of contact, I promptly reached out to the Interpreting manager via email to introduce myself and outline the objective of the capstone project. After exchanging emails, we scheduled a Zoom meeting to delve deeper into the project objectives, discuss the service fees, and determine the feasibility of the project. Once the script was initiated, it took approximately three weeks to complete and required the approval of my mentor. After the script was finalized, we began recording the video in March 2024. My mentor, Evilin, along with my colleagues Laura and Cesar, provided valuable assistance during the two-week creation process. Appendix B below illustrates the execution of the capstone project involving various essential actions as specified in the Project Implementation Plan Table.

#### **Project Results**

The capstone project aimed to create an educational resource for the population of Oaxaca who are fluent in the language Triqui. Despite encountering unforeseen challenges such as the unavailability of the initially identified interpreter and budgetary constraints, the project persevered through diligent efforts to locate alternative solutions. Ultimately, the dedication and

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perseverance of the team led to the successful translation of the pedestrian safety script and the creation of pedestrian safety educational video resulting in an invaluable resource for the Triqui-speaking population. While the intended workshop could not be held, the translated video stands as a testament to the commitment to inclusivity and safety.

The Greenfield Unified School District's community school liaisons were informed about the project, my mentor Jessica Perez and the translator Guadlaupe Cruz gave feedback on my project in order to collect evidence of its success and contributions. The community liaisons stated that a significant number of people in the community are walkers, but they do not have access to resources for pedestrian education due to the language barrier. The district liaison stated "we are excited to see the video and be able to publish it on our website so it can reach the population because they are in need of resources". My mentor Jessica Perez stated "The project is perfect specifically right now since it is based in Greenfield and Greenfield has a high population of indigenous individuals from Oaxaca. With this project we can share with other counties and they will be able to benefit from the video". The translator Guadalupe Cruz stated "It's great that you're looking into language accessibility for the community. I believe this is a great project and it will benefit the community".

Despite not achieving the expected objective of collaborating with the agency Centro Binacional Para El Desarrollo Indigena Oaxaqueño to translate the pedestrian safety script and hold a workshop to present the pedestrian safety video, my capstone project remains useful. The agency can showcase this video to the targeted population and distribute it to neighboring counties in order to effectively reach them. This is particularly important as the population lacks access to resources due to a lack of interpreters fluent in the Triqui language.

### **Conclusion & Recommendations**

The capstone project addresses the contributing factor of language barriers that lead to pedestrian injuries. The project aimed to bridge crucial gaps in pedestrian safety awareness within the Triqui-speaking community by translating a Pedestrian safety video into the Triqui language. Moving forward, the project highlights the importance of flexibility, resourcefulness, and community collaboration in addressing linguistic and cultural barriers to resources available for the indigenous population. Through continued efforts to promote pedestrian safety and accessibility, the project leaves a lasting impact on the Triqui community, fostering a safer and more inclusive environment for all. My suggestion to the organization is that they should proceed with the translation of the script into the various dialects spoken by indigenous populations.

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## Appendix A

| Statistic                               | Monterey County | City Of Greenfield | Table |
|---|-----------------|--------------------|-------|
| Total Population                        | 438,953         | 18,998             | DP05  |
| Population 18 & younger                 | 113, 042        | 7,009              | DP05  |
| Population 21 & Over                    | 304, 052        | 11,079             | DP05  |
| Population 65 & Over                    | 62, 381         | 1,448              | DP05  |
| % Hispanic                              | 59.9%           | 94.0%              | DP05  |
| % White Alone                           | 28.6%           | 3.2%               | DP05  |
| % Not Hispanic or<br>Latino             | 40.1 %          | 6.0 %              | DP05  |
| Families Below<br>Poverty Line %        | 10.1            | 10.9               | DP03  |
| Children Below<br>Poverty Line %        | 17.9 %          | 20.0 %             | DP03  |
| Drove Alone %                           | 69.1 %          | 70.0 %             | DP03  |
| Carpooled %                             | 10.3 %          | 11.9 %             | DP03  |
| Speaks English Less<br>than Very well % | 25.4 %          | 42.8 %             | DP02  |

## Table 1: Demographic Profile for The City of Greenfield

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of this table. The URL goes in the reference list. The matching in-text citation goes here.]

# Appendix B

## **Project Implementation Plan**

| Tasks  | Timeline/<br>Deadlines | Parties Involved   | Materials/<br>Services Needed                  | Deliverables  |
|--|------------------------|--|--|---|
| Meeting with<br>mentor on ideas<br>of capstone<br>project            | 04/13/2023             | Monica Corral and<br>Jessica Perez   | Paper, pen and<br>laptop                       | Research<br>ideas   |
| Finalize idea of capstone project                                    | 10/19/2023             | Monica Corral,<br>Jessica Perez,<br>Barbara<br>Silverthorne                    | Laptop   | Capstone<br>Project<br>Approval                             |
| Meet with Centro<br>Binacional to get<br>contact<br>information      | 10/31/2023             | Monica Corral,<br>Centro Binacional<br>employees                               | Pen, paper,<br>contact info<br>(business card) | A point of<br>contact to<br>reach out to.                   |
| Email Interpreter<br>manager from<br>Centro Binacional               | January 2024           | Monica Corral,<br>Evilin Lopez<br>Zavala, Jessica<br>Perez                     | Laptop   | Quote for<br>services                                       |
| Set up Zoom<br>meeting with<br>Interpreter from<br>Centro Binacional | February 2024          | Monica Corral,<br>Evilin Lopez<br>Zavala, Jessica<br>Perez                     | Laptop, pen,<br>paper                          | Received<br>quote for<br>services                           |
| Creation of<br>pedestrian safety<br>script                           | February 2024          | Monica Corral,<br>Evilin Lopez<br>Zavala, Jessica<br>Perez                     | Laptop   | Plan  |
| Request approval of script   | March 2024             | Monica Corral,<br>Evilin Lopez<br>Zavala, Jessica<br>Perez                     | Laptop   | Script was approved   |
| Send script to interpreter   | March 2024             | Monica Corral,<br>Evilin Lopez<br>Zavala, Jessica<br>Perez                     | Laptop   | Change in<br>employee,<br>needed to<br>receive new<br>quote |
| Request quote<br>from Veronica<br>Chavez                             | March 2024             | Monica Corral,<br>Evilin Lopez<br>Zavala, Jessica<br>Perez, Veronica<br>Chavez | Laptop   | Received<br>new quote                                       |

| Meeting for<br>updating quote            | March 2024 | Monica Corral,<br>Evilin Lopez<br>Zavala, Jessica<br>Perez, Veronica<br>Chavez | Pen, paper, laptop                    | Declined<br>offer                    |
|--|------------|--|---------------------------------------|--------------------------------------|
| Networking to<br>find new<br>interpreter | March 2024 | Monica Corral,<br>Evilin Lopez<br>Zavala, Jessica<br>Perez, Guadalupe<br>Cruz  | Community<br>events,<br>communicating | Found<br>independent<br>interpreters |
| Start recording for video                | March 2024 | Monica Corral,<br>Evilin Lopez<br>Zavala, Cesar<br>Cisneros, Laura<br>Zarate   | Camera, City of<br>Greenfield         | Recording content                    |
| Translation of script finalized          | April 2024 | Monica Corral,<br>Guadalupe Cruz   | Phone                                 | Recording of translation             |
| Finalize Video                           | May 2024   | Monica Corral,<br>Evilin Lopez<br>Zavala, Jessica<br>Perez                     | Laptop                                | Completed video                      |