# CSU Monterey Bay Class: ENSTU 376

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# Summary Report of Bicycle & Pedestrian Counts for Temporary Installations on McKinnon Street & Westminster Drive, Salinas CA

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**Abstract**

To ensure the safety for children and all community members in Monterey County, as part of the Salinas Safe Routes to School Program, The Transportation Agency for Monterey County installed temporary safety measures in front of Harden Middle School located in Salinas, CA. With help from the Sustainable City Year Program and CSUMB students, a study on the temporary installations was conducted to assess their effectiveness in increasing pedestrians and bicyclist traffic, as well as improving their overall safety. Each movement an individual made across the intersection of McKinnon Street and Westminster Drive was recorded during four designated days and time frames both before and after the temporary safety measures were installed. When it was observed, additional documentation concerning dangerous behavior was made. This study concluded that the temporary installations did increase the safety of bicyclists and pedestrians. However, pedestrians may still be subject to unsafe conditions due to the speed of vehicular traffic, and children bicyclists remain susceptible to injury from the lack of prevalent helmet use. Pedestrian activity had a notable increase following the installations, whereas bicyclist activity decreased. It was also found that the temporary installations did not encourage bicyclists to travel in the protected bike lanes. This study argues that an additional speed survey is necessary to better assess the severity of speeding in the area. Education on proper bike lane use for child bicyclists is also recommended. Finally, stronger enforcement of helmet use for minors is imperative. A program to connect the children with such safety gear is advised.

**Background & Purpose**

All children should be able to make their way to school safely. The Transportation Agency for Monterey County (TAMC) is working to ensure children's safety through various Safe Routes to School projects and programs across Monterey County. TAMC is aware that the majority of children in Monterey County are driven to school. This is one of the leading causes of traffic congestion on local roads during the morning and afternoon. This chaotic drop-off traffic in front of schools creates an unsafe environment for children who walk and bike. TAMC is making an effort to bring forth a community approach to achieving a deep and comprehensive impact for children's safety through the Safe Routes to School Program. One specific project that TAMC employed took place in front of Harden Middle School and was made possible through the Sustainable City Year Program. The Sustainable City Year Program is a connection made by universities and communities to assist with local needs. The program is intended to assist local municipalities with sustainability-related projects that they would like to take on but may not have the resources to do so. For this project, an Environmental Studies class focusing on infrastructure at California State University, Monterey Bay, collaborated with TAMC to collect bicycle and pedestrian count data and assess the effectiveness of the project.

The project in front of Harden Middle School was focused on the intersection of McKinnon Street and Westminster Drive, with the goal of getting feedback from the community and improving safety. TAMC added temporary curb extensions on Westminster Drive and changed bike lanes to protected bikeways with a barrier from cars on McKinnon Street. Examples of these temporary installation are found below in ***Figure 1***. To properly evaluate the effectiveness of these temporary measures, CSUMB students were tasked with counting the movements of pedestrians and bicyclists across the entire intersection. The counts were primarily intended to answer the following question: How do the temporary installations impact pedestrian

and bicyclists' behaviors? Questions of more specific interest include, Do the temporary installations improve safety for pedestrians? Do the temporary installations improve safety for bicyclists? Do the temporary installations encourage more pedestrian and bicyclist activity? Recording the activity within the intersections through pedestrian and bicyclist counts allowed for a comprehensive investigation to answer the questions of interest.


***Figure 1*. Temporary Bike Lane Separations on McKinnon Street**

## Methodology

The counts were recorded by CSUMB students, whose role included observing and tallying the movements of pedestrians and bicyclists across the McKinnon and Westminster intersection. An example of how the intersection was labeled for the purpose of counting can be seen in ***Figure 2*** below. These counts were taken from 7-9am and 2:30-4:30pm on Tuesday April 5th and Thursday April 7th before the installations. After the installation of the curb extensions and separate bikeways, counts were taken during the same time frames on Tuesday April 26th and Thursday April 28th.

During the counts, students recorded the number of individual movements people made at any of the four crossings, as well as turns they made on corners of the street. Counters specified if the pedestrians or bicyclists were adults or children, if the crossings were considered

safe, if child bicyclists were wearing helmets or not, and if bicyclists were traveling on the sidewalk or street. A safe crossing was one in which a pedestrian or bicyclists used the designated pathways and did not have a dangerous interaction with the vehicular traffic.

Additional notes were recorded if dangerous or unusual behavior was observed. Counters also recorded the opinions and input from community members as well as teachers from Harden Middle School that approached them about the study. To account for other variables impacting the results, the temperature and weather conditions during each count were also documented. Weather during every count was mild; no rain, extreme heat, cold, or wind was recorded. It is likely that the weather did not impact the results of this study.

Within the collected data, there is some information regarding bicyclists that is incomplete or was entered incorrectly. The data is concerned with helmet use by child bicyclists and if the bicyclists were traveling on the sidewalk or street. The findings and conclusions further explain in detail the impact of this on the study.

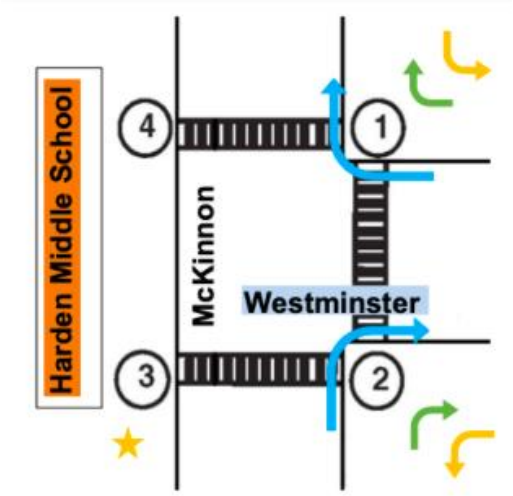



***Figure 2. Labeled Intersection for Counting***

**Findings:**

To gain a better understanding of the results of this project, an overview of three themes within the findings will be presented. These include results relating to pedestrians, bicyclists, and dangerous behaviors. These findings will relay comparative information and data from before and after the temporary installations.

### *Pedestrians*

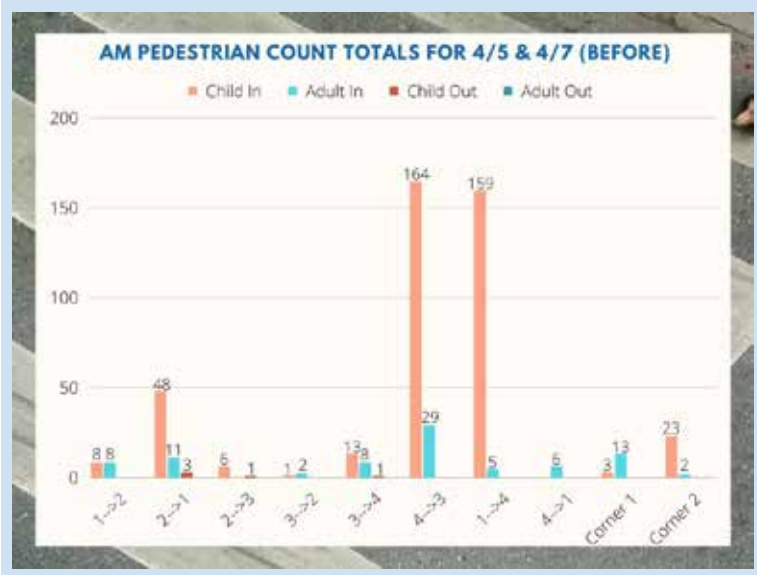
***Figure 3*** below displays several findings from the study. Within the graphs, categories of "In" signifies that the crossing took place within a designated pathway and that the crossing was considered safe from vehicular traffic. On the other hand, those that say "Out" indicate that the crossing took place outside of the crossway and was considered an unsafe crossing. "Before" signifies the count data prior to the installation of the temporary safety measures and "After" signifies the data that was collected following the installation of temporary street improvements. Since the before and after counts for Tuesday and Thursday were generally comparable to each other, the data from the two days was compiled into sum totals.

As seen in the graphs, movements of children were far more frequent than adults at almost every crossing. In the morning, the most frequently crossed pathways were from 2→1 with 48 children inside the crosswalk before and 44 after, 3→4 with 13 children before and 21 after, 4→3 with 164 children before and 228 after, and 1→4 with 159 children before and 175 after. Likewise, in the evening, the most frequent crossings for children included: 1→2 with 40 before and 72 after, 2→1 with 63 before and 49 after, 3→4 with 307 before and 435 after, 4→3 with 35 before and 70 after, 1→4 with 19 before and 47 after, 4→1 with 215 before and 248 after, and finally Corner 2 where there were 44 turns before and 54 turns after the pop-ups.

The main pathways traveled by children are the crossings between locations 4 and 3 as well as the between locations 1 and 4. Both were traveled in high frequency in the morning and

afternoon, just in the opposite direction. In the morning, children typically traveled sequentially from 1→4 then, from 4→3. In the afternoon, they typically travel from 3→4 then, from 4→1.

The graphs further demonstrate that there is more pedestrian traffic during the afternoons than there is in the mornings. Moreover, there are more children crossings that took place outside of the crosswalks during the afternoon. It is important to note that one of the most frequent crosswalks that children traveled outside of was 3→4 in the afternoon. This pathway is not an actual street crossing, but a sidewalk where the large bins were added as a barrier between the bike lane and the street. The data is unclear whether the pedestrians were traveling behind these bins in the bike lane, or in front of the bins in the street.



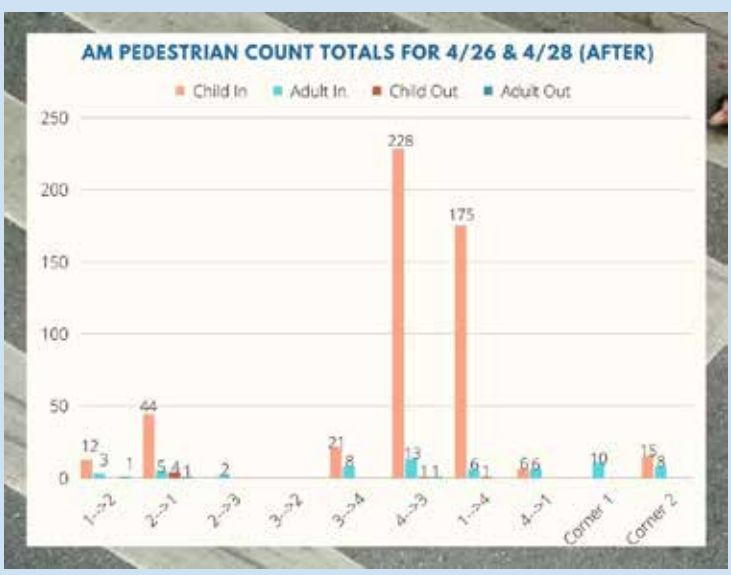




***Figure 3. Pedestrian Count Graphs***

***Bicyclists***

Similar to ***Figure 3, Figure 4*** also displays compiled data from two data collection days to best showcase the findings. ***Figure 4*** shows that in the mornings of the pre-counts, there were a total of 94 bicyclists. Within this, 40 were children, 38 of which, traveled on the sidewalk. In the afternoon of the pre-counts, there were 37 bicyclists. 22 out of the 37 bicyclists were children with 18 traveling on the sidewalks. After the temporary measures were installed, post-counts revealed that in the morning there were a total of 35 bicyclists. 28 of these bicyclists were children, with 25 of them traveling on sidewalks. Likewise, the afternoon post-counts totaled 49 bicyclists. Out of the 49 bicyclists, there were 41 children. The data that was collected during these time frames does not indicate whether these children traveled on the sidewalk or the street.

Cumulatively, ***Figure 5*** reveals that there was a total of 131 bicyclist movements during the pre-count, and 84 bicyclist movements observed during the post-count. This is a 35.9% overall decrease in bicyclist traffic. In the mornings, bicyclist traffic decreased by 62.7%.

However, in the afternoon, bicyclist traffic increased by 32.4%. Overall, the number of bicyclists decreased following the installation of the temporary measures.

Lack of helmet use by children bicyclists proved to be a significant finding within the study. The data collected on helmet use may not be reflective of the precise percentage of children that wore helmets due to data entry errors. However, based on substantial observational data, it can be concluded that there were very few children who wore helmets. The vast majority of children bicyclists did not wear helmets. A change in the frequency of helmet use by children bicyclists was not observed following the installations.

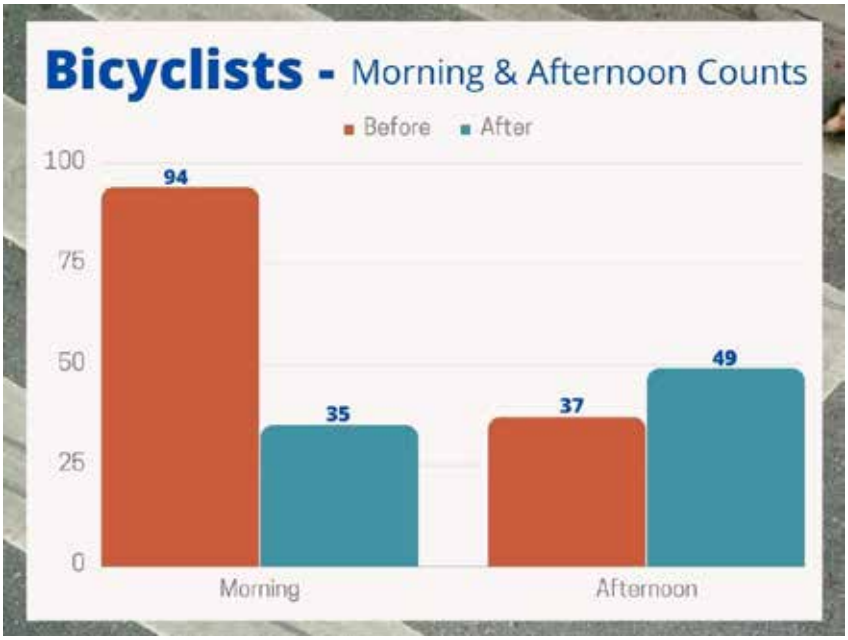



***Figure 4. Morning & Afternoon Counts of Bicyclists Graph***

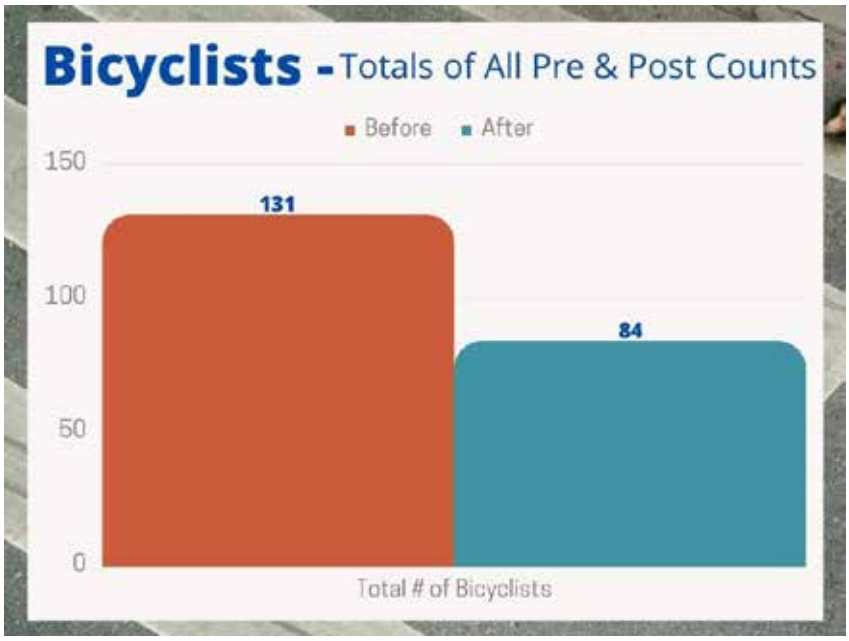



***Figure 5. Totals of Before & After Counts Graph***

### *Dangerous Behaviors*

Based on observational data collected during the study, vehicular traffic was a significant contributor to dangerous behaviors within the intersection. Prior to the installations, cars commonly pulled into the unprotected bike lanes on McKinnon Street to drop-off or pick-up children. ***Figure 6*** below provides an example of this frequent occurrence. Following the installation of the temporary bike lane barriers, cars were no longer able to make this maneuver. Instead, they then opted to park in the residential streets down Westminster Drive. These locations down Westminster became crowded and cars ended up blocking intersections, parking in front of driveways, and in fire lanes as they waited to pick their children up. One CSUMB student counter reported on the deeper implications that could arise as a result of vehicles blocking intersections:

> "During [a post-count] count on Thursday April 28, multiple cars were parked, blocking the fire lanes where Westminster opens onto McKinnon (in the 1→2/2→1 crossing, see Figure 1). A few minutes later, I observed an ambulance and fire engine responding to a

> medical emergency on Tynan Court, which intersects Westminster near the count site. If those cars had been blocking the lanes, neither emergency vehicle would have been able to access the street without driving over a planted center divider and knocking over a sign. This is the only major drawback I can see with the installation: as parking opportunities are limited on McKinnon to create safer conditions for pedestrians, drivers are routed onto residential streets, causing potential issues for emergency and residential access to the neighborhood. Granted, this problem only arises during school pickup hours, but it is still a concerning possibility."

After the temporary installations were put in place, it was observed that the number of children who were dropped off in the morning within the intersection significantly decreased. More specifically, there were fewer cars that stopped to drop off children in front of the crossing between locations 3 and 4. Prior to the installation, this was a popular spot for cars to stop and drop off children.

Another frequent dangerous behavior observation made by counters relates to the speed of vehicular traffic. Before and after the installations, multiple counters noted that the speed vehicles were traveling down McKinnon was a concern. Although the actual speed of vehicles was not recorded in the study, it was evident that they were traveling at a speed that was unsafe for pedestrians. One observation of particular importance deals with the crosswalk between locations 1 and 4. During the morning counts, both before and after the installations, it was recorded that a child was almost hit by a vehicle in the middle of this crosswalk. In both instances, the children had to make abrupt stops in the middle of the crossing to avoid being hit by a car.

***Figure 6. Cars Parked in Bike Lane on McKinnon Street***

## Conclusions

The purpose of this study was to gain insight into the following questions: How do the temporary installations impact pedestrian and bicyclists' behaviors? Do the temporary installations encourage more pedestrian and bicyclist activity? Do the temporary installations improve safety for pedestrians and bicyclists?

It is concluded that overall pedestrian traffic increased following the addition of the temporary street improvements. Almost every route during the post-installation counts had a notable increase. It is also clear that the main routes traveled by children are the crossings between locations 4 and 3 as well as the crossing between locations 1 and 4. Both of these were traveled in high frequency in the morning and afternoon, just in the opposite direction. From this, it can be assumed that many children are being picked up in the same places that they are dropped off for school or that they live in the neighborhoods accessed by Westminster Drive. It was also observed that children traveled outside of the crosswalks more frequently in the afternoon than in the morning. This is likely a result of a rush of students being released from

school at the same time and the resulting crowding on the sidewalks in front of Harden Middle School. Since the children are traveling outside of the pathways during these times, the bins that were set up in front of the 3←→4 crossing are likely providing a necessary safety barrier to protect the child pedestrians from vehicular traffic.

This temporary barrier bins in front of locations 3 and 4 proved to be advantageous for bicyclists who utilize the bike lane as well. They actively assisted in inhibiting cars from entering and parking in the bike lane to drop-off or pick-up children. The bins, along with the other temporary installations that created protected bikeways, allows for bicyclists to safely travel in the bike lane without the risk of interference from vehicles. Despite the fact that the protected bikeways are making traveling in the bike lane safer, they did not encourage bicyclists to travel in the bike lanes themselves. Although it cannot be concluded with full certainty due to missing data during the afternoon post-counts on whether the bicyclists were traveling on or off the sidewalks, the data that is available during the morning counts indicates that there was no change in bicyclists traveling on the streets instead of the sidewalk. Bicyclists continued to travel on the sidewalks.

As it has been presented, there was an 35.9% overall decrease in bicyclist traffic following the instillations. In the mornings, there was a decrease of 62.7%. Only during the afternoon was there an 32.4% increase in bicyclists traffic following the installations.

Although the temporary installations were not created with the intention of improving this observation, one of the main concerns that became evident within the study is the lack of helmet use in child bicyclists. Very few, if any, children wore helmets while riding their bikes. This is a significant safety risk for children.

An additional safety concern for both pedestrian and bicyclists is the speed of vehicular traffic on McKinnon Street. The installations did not appear to significantly lower the speed that

vehicles are traveling. Pedestrians and bicyclists continue to be at risk from speeding cars. While this study reported only two "close-calls" events where children were almost struck by motorists in a designated crosswalk, other stakeholders such as Harden Middle School teachers, have reported that it is a common occurrence.

In all, the temporary installations did increase the safety of bicyclists and pedestrians by providing a safety barrier from motorists. However, pedestrians are still subject to unsafe conditions due to the speed of vehicular traffic, and children bicyclists remain susceptible to injury from the lack of prevalent helmet use. Pedestrian activity had a notable increase following the installations, whereas bicyclist activity decreased. The temporary installations did not encourage bicyclists to travel in the protected bike lanes.

### *Recommendations*

To address the safety concerns that this study has uncovered, a few recommendations for infrastructure improvements and programming should be taken into consideration. First, to make a more accurate assessment on the speed of vehicular traffic within the area, an additional speed survey is recommended. Once the severity of speeding is recorded, it would allow for a better examination of pedestrian and bicyclist safety. Then, applicable recommendations on how to decrease the speed of traffic can be made.

An additional recommendation is to better educate child bicyclists on using the bike lanes. Child bicyclists may not be aware that using sidewalks while traveling on bikes is unsafe and that the street bike lanes is where they should travel instead. Sufficient education on bicycle policies for children will enhance safety for all. It may also encourage more children to bike to school after they have had the opportunity to become more familiar and confident about biking.

However, if measures continue to be taken to encourage children to bike to school, helmet enforcement for children under the age of 18 must also take effect. Whether this be through actions Harden Middle School takes to regulate helmet use, through local law enforcement, or even through a program that allows children to gain access to safety gear such as helmets, intervention is necessary.