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Safe and Sustainable Commutes

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Safe and Sustainable Commutes

California State University Monterey Bay
School of Natural Sciences

Fall 2016

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Abstract:
A group of six undergraduate students worked with a local city government, their professor, and other university leaders to develop a research project related to sustainable community transportation. A city road project was analyzed to understand the sustainability implications to a changing transportation system. By taking a closer look at the city and the adjacent residential community, the project was examined. Additionally, a university project was undertaken to investigate the adoption of an alternative transportation resource on campus. With this information gathered, the campus community has the ability to further utilize new resources to improve campus transportation sustainability.

Introduction:
The Sustainable City Year Program is a university-community engagement program where city management works with a university faculty member through a course to create community-based collaborative projects for students. The course had three groups of students participating from California State University Monterey Bay (CSUMB) for the Fall 2016. The Sustainable City Year Program and the Safe and Sustainable Commutes group completed two separate, yet related projects. The first was directly related to the CSUMB campus community and the other with the City of Salinas.

The CSUMB campus project took a closer look at CSUMB’s Master Plan and the University’s transportation agenda for the future. The campus project focus on CSUMB’s new collaboration with the car sharing program called Zipcar. Zipcar offers affordable rental cars for commuting, weekend trips, and errands. The company encourages car sharing to promote city and campus sustainability. The Zipcar program and a university contract was finalized in the Fall of 2016. As a result the campus community has yet to gain knowledge of what to expect from the program and how to best promote it. The group set out to answer this in the context of a growing campus population as well as how this growth creates challenges for a sustainable transportation system. A survey was conducted to gathering information for the campus community to start tracking the success of the Zipcar program on campus (Appendix A,B,C).

The second partnership was with the City of Salinas and the Public Works Department's transportation planners and engineers. This portion of the project was coordinated by a Faculty member; as part of the Sustainable City Year Program. The neighboring City of Salinas was chosen in conjunction with this program. The Public Works Department utilized university assistance for cyclist and pedestrian counts at project site cross streets (Towt and Market - Appendix E). Additionally, community outreach was conducted in the surrounding community since the project directly affects community residents. The East Market Street project is being funded by a grant awarded by the California Department of Transportation to City of Salinas for their Via Salinas Valley: Active Transportation Program. This program is partnered with the National Safe Routes for Schools program to incentivize walking and bicycling to school by making communities routes safer by constructing bicycle lanes, improving crosswalk safety, accessibility, and visibility.
Campus Zipcar Transportation Project

Background:
California State University Monterey Bay (CSUMB) opened in 1994 and the first class had only 654 students enrolled. Other CSU campuses have grown in the past 22 years, while CSUMB still has remained relatively small with about 7,634 according to the Fall of 2016 enrollment data (Inst. Ass. Res., Fall 2016). The Master Plan states the campus is expected to grow to 12,700 full-time students by the year 2020 in Appendix D. Another expectation, outlined by the plan, is to house 60% of students in on-campus housing (Campus Planning and Development, 2016). The growth of the student population may result in a more congested campus, with an increased carbon footprint and necessity for large parking garages. If this trend continues, CSUMB will struggle to maintain and improve upon its’ sustainable practices.

The 2013 Climate Action Plan aims to have climate neutrality for the CSUMB campus by the year 2030 (Campus Planning and Development, 2016). The master plan addresses sustainability in nine areas, one of them is transportation. In the past decade, campus planners have been challenged to increase mobility and access without destroying campus quality and livability. Some of the options to improve sustainability, decrease congestion, and increase the safety of streets include raising the price of parking permits, expanding transit access, adding park and ride shuttles, enhancing bicycle or pedestrian facilities and developing carshare programs (Balsas, 2003). The Master Plan incorporates these options and displays them on the campus map that can be found in Appendix D. All of these options are already planned to be incorporated on campus; however, most recently, carshare has become the topic of conversation.

Zipcar offers about ten thousand vehicles in five countries across North America and Europe and is partnered with approximately five hundred universities in North America. According to a study done by TSRC UC Berkeley, Zipcar and other university partners have approximately 10,040 college and university members within North America (Stocker A, Lazarus J, Shaheen S. 2016). Zipcar is a company expected to grow by 30 percent each year with 130 million in annual revenues (Keegan, 2009). For university partnerships rental and usage rates for vehicles can be lower because campuses provide vehicle storage. If Zipcar is heavily used by a campus population less parking needs to be devoted to single owner vehicle spots. This can free up valuable campus real estate for other purposes (Binette, 2016). The company is thriving and so are Zipcar customers due to financial savings on automobile ownership costs. On average those who have switched to Zipcar have saved 600 dollars per month and cut their CO₂ emissions in half. This is the motivation for many college students to use Zipcar (Binette et al, 2016). Universities are partnering up with the promising carsharing program to promote car sharing and sustainability on their campuses (Keegan, 2009). In the efforts to offer other forms of transportation CSUMB joined the partnership by adding two Zipcars to campus in the Fall of 2016. The Zipcar program began with the University advertising the new partnership via a 362-word description of what the program offered (CSUMB News).

Project Challenges:
CSUMB is a very unique campus that provides a natural setting rich with wildlife, history, and culture. The Monterey Bay is growing in popularity and is becoming a desired area to live and go to school. There is pressure on CSUMB to grow enrollment for multiple reasons. One reason is the University is helping to fill the economic void the military left when the Fort Ord base closed. Another reason to increase enrollment is to ease the overcrowding of other CSU
The region and CSUMB are at a critical point in their growth and development. At this critical point the infrastructure must be improved to accommodate the needs of students, faculty and staff.

The Campus Planning and Transportation Department realizes the challenges growing sustainably without losing campus culture. The long-term Master Plan, considering current campus growth expectancy, would require a doubling of gross square footage for facilities and housing (Masterplan, 2016). However, the impending future development will likely impact traffic congestion as well as parking demands. With increased enrollment and new buildings taking the place of existing parking lots, less parking will be available. To mitigate the intertwining growth and sustainability issues, the Master Plan has incorporated sustainability objectives. The expansion of parking lots has shown itself to be the least viable option to moves towards campus sustainability objectives. These objectives work to provide different travel options for the campus community. Carshare and affordable car rental have become a new travel option for the University.

The community and campus representatives desire to preserve the unique setting and qualities found at CSUMB. Campus planners are pushing for new development to meet sustainability objectives in a variety of ways. These objectives outline the preservation of open space, improving campus connectivity, and providing transportation options. The primary mode of transportation for students is currently personal vehicles. Currently 70% to 78% of students, faculty, and staff drive alone to campus (Master Plan, 2016). An objective set out by the master plan is to significantly reduce solo drivers to 30% of campus population. Additionally, 50% would walk, bike, or use other modes of transportation and the remaining 20% would include shared rides (Master plan, 2016). For CSUMB to meet these objectives, transportation alternatives are needed alongside infrastructure changes that improve pedestrian and bicycle accessibility.

The CSUMB campus currently has some of these transportation alternatives in place and improvements are continually being made to reduce the amount of cars on campus. Alternatives include a bus partnership with MST, the presence of four Zipcars, bike access improvements, walking options, and new campus housing. With the continued campus population growth, and the preferred method of transportation being driving alone, the sustainability objectives in place remain a significant challenge. As a result of this paradox, the Master Plan incorporates a design plan aimed at desensitizing driving a personal vehicle (Master Plan, 2016). Specifically, centralizing campus and moving parking to periphery will encourage walking, biking, or skating around campus instead of driving. This was depicted in the Master Plan Campus layout which can be found in Appendix D. For students in East Campus improvements to a safe bike path between housing and main campus encourages alternative transport. An important way CSUMB is pressing transportation initiatives is through the new Zipcar partnership. Other CSU campuses such as Northridge and East Bay/Hayward already have Zipcars on campus. University of California campuses have led the way with Zipcar partnerships. U.C. Davis, San Diego, Santa Barbara, Irvine, Riverside, and Berkeley have Zipcars available to students (Zipcar.com, 2016). By having Zipcars on campus CSUMB is diversifying its’ transportation options to meet sustainability objectives.
Methodology:
The research goal was to determine how many students, faculty, and staff are aware of the Zipcar program on campus. A survey consisting of 16 questions was administered to gather data. A complete list of questions can be seen in Appendix C. Qualtrics survey generator was used and allowed the survey to be distributed via email. The responses to the surveys were analyzed and summarized below.

Analysis:
The data collected directly correlates with the Zipcar and Transportation Survey responses. Most of the data collected was to determine the transportation habits of students and their knowledge of Zipcar. Through the answers we were also able to determine what demographics the survey was not able to reach. Most of the survey takers were students with 75.6%, with 43.7% whom live off campus, 62% are aware of Zipcars, 77.3% own a car, 85.7% are licensed in California, and 92% of the responses stated that they are not Zipcar members. Data can be seen in Appendix A. Out of the data, only nine survey takers indicated they were Zipcar members. We also found that 27 individuals are not car owners. These 27 individuals must rely on other modes of transportation to get around campus and to nearby cities. Only nine individual survey takers are Zipcar members and eight of those live on campus. Nine of the survey takers were also international students. Campus Planning acknowledged they were interested in knowing how international students adopt Zipcars. The survey showed the most common reasons students that travel off campus is for work (56 individuals), grocery shopping (41 individuals) and errands (8 individuals).

College campuses are unique communities that have the potential to implement dramatic changes in a short period of time. CSUMB is an ideal campus for alternative forms of transportation to take hold. The team developed a set of criteria that Zipcar and the University could use to increase transportation sustainability on campus. With campus growing and sustainability goals in place, all that remains is the implementation phase. The promotion of carshare on campus is a systematic way for CSUMB to promote sustainable transportation, reduce campus emissions, mitigate traffic congestion, and lower parking demands. Other motivations for collaborating with Zipcar include providing students without vehicles easier accessibility to travel for groceries, stores, and other amenities.

The survey results implied a need to increase Zipcar marketing to reach another 37.82% of respondents who said they were unaware of Zipcar on campus (Appendix A). CSUMB currently markets Zipcars through their website, pamphlets and other handouts, the Transportation e-newsletter, and campus outreach events. However, there should be an increase in marketing by Campus Planning and Transportation as an attempt to encourage carshare on campus. Matthew McCluney, one of CSUMB’s Campus Planners, intends to increase communication about Zipcar through the school website, emails, and tabling events. In the future these communication avenues and subsequent survey efforts should be concentrated on University members who live on campus. The data from the survey showed students still had questions about how to use the Zipcar program even after they had already known about it. University members have very busy lives and accessibility is a key factor in their transportation choices. Based on this information, we recommend Zipcar improves their marketing strategy and provides a permanent Zipcar representative on campus that members can visit or contact them to assist with questions and technical issues.
As part of the research, a Zipcar and carsharing was used to travel three times to Salinas for project needs. The main issue that arose were technical issues using the Zipcar mobile application. In order to unlock a Zipcar vehicle a Zipcard or mobile application is needed. Several application glitches were discovered that created barriers in the future which deterred our easy access to Zipcar. Another major problem that was encountered was related to the possibly of the Zipcard being lost causing strandings. The phone which was authorized to unlock the car, using the mobile app, had ran out of battery and the Zipcard was dropped and lost after the car was parked. In an attempt to log in to the account using a different phone, the group found that the car could only be unlocked using the phone in which the account was authorized. Without the correct phone or the Zipcard there was no way for us to unlock the car and return it at the appropriate time. When calling the Zipcar Company for assistance, the employee expressed that she was unable to help us with this predicament. One option left was for one of the other students to go through the process of getting a membership and reserving the car after the reservation already established had concluded. This was not a great option given the situation and the other students not having the means to pay the membership, not having a smartphone in which to utilize the application or simply not having enough battery that it would take to download and implement the application. The group was able to retrace their steps and find the Zipcard, however, the group was left wondering what would have been done if the Zipcard had not been found. This could be improved by allowing other phones to be authorized to unlock the car when signing into one’s account.

Although the Zipcar program is becoming increasingly popular, there are still several improvements, which should be addressed to increase their utilization. Some of these recommended improvements are within Zipcar’s website such as the website search tool for finding one’s campus and if they are part of the Zipcar partnership. On the search tool Zipcar's website requires you to write out the name of your campus accurately. If not done so the school will not show up, that means when typing in abbreviations the website will tell you that the partnership is non existent. Having an onsite representative would also be extremely helpful especially for international students. For example one international student expressed many questions about Zipcar when our group approached her with the survey. She was very interested in the Zipcar program when she first heard about it through flyers but felt lost when it came to finding help. The team was able to give her some guidance and later she let us know that she signed up for the program and was eagerly awaiting her Zipcard in the mail. Having an onsite representative could have eased her worries.

**Salinas Road Project**

**Background:**

The City of Salinas is located 10 miles away from the Monterey Bay and according to its website it has a population of nearly 157,000 people with 23 schools in the K-12 system and over 21,000 students. Salinas, California is located at the mouth of the Salinas Valley which is one of the most productive agricultural regions in the nation. Many of the highly used streets in the city are designed with four lanes wide, with two lanes going in each direction. The roadways are currently designed to move a large volume of vehicles quickly through the city.

Although these wide streets may be effective for moving large volumes of vehicles, they are not considered to be “livable” or safe streets. Livable streets are defined streets that have a continuous sidewalk, street trees, street parking as a buffer, and public right of way (Dumbaugh,
Aside from not being “livable” streets, they are also not safe for pedestrian or student use with few crosswalks, poor lighting, no bike lanes, and lack of visibility for both pedestrians and motorists. According to a study, by Safe Routes for Children: What they want, and what works by Paul Osborne, the United States has invested heavily in the school bus system, however, an average of 44% of students use automobiles to get to school. Methods of transportation used by people has been directly linked to obesity. For instance in Denmark 50% of people bike to work and only 8% are classified as obese while 49% of Americans drive to work and 23% are considered obese (Osborne, 2005). The habits that student’s form at university follows them through life and can improve the overall health of the community.

Victor Gutierrez, the Engineer Director of Public Works for the City of Salinas, wrote and received a 2.1 million dollar grant from California Department of Transportation from the Active Transportation Program (ATP). The ATP was signed by Governor Brown in 2013 and combines the previously existing Transportation Alternatives Program (TAP), Bicycle Transportation Account (BTA), and State Safe Routes to School (SR2S) (State of California, 2016). The California Safe Routes to School Program was initiated in 1999 and the state was the first in the country to adopt the program. The aim of the program has been to provide cities with funding to enhance the roadway infrastructure near school zones.

The City of Salinas requested our team to assist with the East Market Project. The city is planning to undergo a road diet construction project that will begin in January 2017 (City of Salinas, 2016). The project directly affects community residents and the two schools, Fremont Elementary School and El Sausal Middle School, located on East Market Street. The road diet infrastructure improvement is between Eucalyptus Street and Midway Drive on East Market Street. The implementation of a ‘road diet’ means that road space is designated for shared use. In the case of this project, a four-lane road is converted into a two-lane road with a shared left-hand turn lane in the middle (FHWA, 2004). An added bicycle lane improves cyclist safety, provides a buffer zone between parked cars, and improves motorist safety by reducing conflict points (Jaffe, 2014). This is part of a larger vibrancy plan “To update the downtown infrastructure to assure pedestrian safety, calm vehicular traffic, encourage bicycle use, provide a sustainable parking strategy, and create a sense of community through art and culture to attract visitors to a new, safe destination” (City of Salinas, 2016). East Market street is a main street in downtown Salinas. This project will consist of reducing the number of lanes and downsizing the existing lanes on E. Market Street from Eucalyptus Street to Midway Drive. The project will implement bike lanes on each side of the street, sidewalk widening, addition of curb extensions (also known as bulb-outs), traffic light installation (See Appendix F). The new road diet or downsizing will calm traffic and the additional design elements will increase cyclist and pedestrian visibility and safety.

Project Challenges:

The City of Salinas is one of the California’s largest agricultural communities and agriculture has a large economic influence. However, years of districting and zoning regulations have led to unequal development throughout the city and an outdated road structure. Currently, the city lacks the infrastructure required to help encourage alternative transportations. As a farm community the roads were built to handle large trucks with little space for other modes of transportation. Therefore, the main form of transportation in the city are single occupancy vehicles. With high volumes of vehicles and poor infrastructure it can cause communities to feel unsafe to walk or bike, especially for the students. Since East Market is a high volume roadway
only during the peak commuting hours the numbers of lanes and existing lanes will be downsized. This is designed to allow residents and students to safely cross the streets and help reduce traffic.

Marin County in northern California, has implemented road diets through the Safe Routes to school program. By the program's second year in Marin County, it had reached 4665 students in 15 schools. Participating schools showed an increase in walking, biking and even carpooling. Biking had increased by 114% whereas walking increased by 64% and carpooling by 91% (Staunton, 2003). These types of road diets have been shown to improve city infrastructure and grant safe, accessible pedestrian bike routes to schools. This type of infrastructure improvement in designed to encourage alternative transportation methods, increase community livability, and maintain automobile street capacities.

**Methodology:**

The city is looking for the community to come share their concerns, requests and approval of the upcoming plans to ensure that the city and the communities are working hand in hand. The community needs to be involved in the decision making process so that the changes made are best utilized and don’t go to waste. The City of Salinas requested our assistance in pedestrian and cyclists counts on cross streets located on East Market Street. They also requested that public outreach be another component of the East Market Street road diet project. The city has had three meetings in regards to the construction that would be occurring on East Market street. Each meeting had poor community turnout so they requested our help to go door to door and inform the public surrounding the school about the project and when their next meeting would be taking place. The group spoke directly with residents, left flyers in mailboxes, and posted flyers on utility poles.

**Analysis:**

The pedestrian and cyclists’ counts that were completed for the City of Salinas can also be conducted post-construction to understand whether or not the project facilitated an improved flow of pedestrian and cyclists during pickup and drop off hours at the schools. Nationally, 10 to 14% of car trips are during the morning school rush hour (Safe Routes, 2016). More information regarding the pre-construction pedestrian and cyclist counts on E. Market refer to Appendix E.

When conducting the door-to-door outreach the team reached 114 homes after four days of public research, which can be seen in Appendix K. During the community outreach process 114 homes or 51.7% answered the door. The group was able to communicate with them about the impending construction and informational meeting at Fremont Elementary school. In these conversations, community members were made aware of the changes that will be occurring on East Market Street as well as providing them with information regarding road diets. A few community members expressed to us that they were unaware of what a road diet was. One recurring matter the group faced was the language barrier. The group was able to speak with 71.1% of the homes solely speaking Spanish. The City of Salinas is made up of 157,000 people 75 percent of who are Hispanic or Latino (U.S. Census Bureau). The team knew that going door to door would be rather challenging since the main demographic being encountering were monolingual Spanish speakers. However, the group had a few students whom are either proficient or fluent in Spanish making it possible to communicate.

The mindset of the past was if more vehicle lanes were added to a roadway traffic flow congestion would decrease. What occurs instead is the roadway has incentivized driving and
more drivers quickly create new congestion. New studies have indicated that the implementation of road diets or downsizing roadways can incentivize other forms of transportation. These projects can also improve safety and vehicle congestion. The City of Salinas contracted a transportation study that specifically took vehicle counts between exact cross streets where construction will be occurring. The Average Daily Traffic (ADT) counts between Eucalyptus and Towt were 8,965 (Fehr and Peers, 2015). ADT counts west of 2nd Avenue on East Market Street were 5,707 (Fehr and Peers, 2015). To put this in perspective, a high ADT roadway in Washington on Lake Washington Blvd south of 83 had an ADT count of 23,000 before a road diet was constructed. After the project the safety for vehicular traffic and accessibility for other modes of transport greatly improved and traffic congestion remained stable (Burden et. al., 1999).

Updating the existing road structure in various areas allow for alternate methods of transportation for pedestrians. Roadway updates also help to reduce traffic and speeding in the city. According to the Transportation Agency for Monterey County Board Meeting Highlights, the Via Salinas Valley: Active Transportation Program is designed to make safety improvements on streets which in turn will allow residents to safely bike/walk, improve access to schools/parks and reduce car speeds/traffic volumes. The ultimate vision of this improvement is to support a healthier and active lifestyle, which can lead to healthier families and communities. Funding from programs like the Via Salinas Valley: Active Transportation Program make it possible for communities to fund needed infrastructure improvements.

Although the City of Salinas has methods for reaching the community, attendance and participation at community meetings is relatively low. One improvement they could make is to send information to many people at once through various types of media. As technology improves, more and more people are relying on apps, such as Facebook, for information regarding their interests. The Salinas Facebook page itself has a little over 44,000 followers however is not very active. The City of Salinas even has an official Instagram account with over 500 followers but had only nine posts in the last two years. These large social media platforms could be a great opportunity for the city to increase their various community outreach efforts.

Moreover, since these road diet projects are directly correlated to improve routes to and from schools through the Safe Routes to school program, the city of Salinas could have a better relationship with the surrounding school districts. By collaborating with the schools it could increase a better understanding of how to use the implemented road diets and get the surrounding community more involved. The city of Salinas could also reconsider the time and place of the community meetings, with this new found collaboration, and work with the schools to reach a greater attendance.

**Conclusion:**

Overall for our Zipcar project general continued outreach to incoming freshman, parents, and international students to encourage more robust use of campus Zipcars would be ideal for the CSUMB campus. Continued efforts to desensitize driving alongside the planned infrastructure changes will move the campus towards its’ sustainable transportation initiatives. It is our hope that carshare and Zipcar usage will also be adopted by nearby cities of Salinas, Marina, Sand City, Seaside, Monterey, Pacific Grove, and Carmel since they are all areas influenced by increased student mobility. The University and alumni students act as instruments for change in their surrounding communities. They become involved in their community and take with them the practices and lessons they have learned (Balsas, 2003). By laying out the foundation of the
CSUMB Zipcar partnership future studies can be done to enhance partnership relations and success.

With the Salinas Project, which describes multiple changes to E. Market Street, is an ideal way to move towards a better infrastructure and easily accessible routes to schools, which will in turn encourage alternative transportation means and a positive impact on the city. However, in order for this to happen the city needs to understand that not only do they need to work on the infrastructure but they also need to create a better relationship with the community so that they can better understand and utilize the changes made by the city. Some ways to improve this are to seek more community engagement. Since most of the projects that the City of Salinas is working on to improve infrastructure are happening closer to schools and with one of the intentions of the construction is for children bike and walk to and from school. Some advice would be to create better communication with the school district and provide them with the tools to share the information of projects and how they are going to benefit from them. Schools can get involved by communicating with parents during drop off and pick up hours or even sending home flyers that require a signature stating that the parent has read the information. The flyer can even have a question section that allows parents to ask questions on the flyer and have them be sent directly back to the city.

Another method that the city should consider is social media. It was found that the City of Salinas is not utilizing social media enough to reach the community. And with social media growing, by taking advantage of such an easy way to reach people the city might have greater community engagement. Live streaming and recordings of community meetings would be another way to include parents with conflicts. Online conversation platforms could also allow for public comment without specific meeting attendance.

Pedestrian counts have only been completed during the pre-construction phase. It is necessary for another set of counts to be conducted after the project completion. These subsequent counts will allow the project effectiveness to be analyzed. Insights found will allow the surrounding community to determine if the project has benefited them and their community.
Appendices:

Appendix A - Survey Demographics

Q3, Q4:

Q3 - What is your affiliation with CSUMB?

Q4 - Where do you live?

Q5:

Q5 - Which of these applies to you?
(Please check all that apply)

Number of Responses
Q6, Q7:

Q6 - Prior to this survey, were you aware of the zipcars at CSUMB?

- Yes: 38%
- No: 62%

Q7 - Are you a zipcar member?

- Yes: 8%
- No: 92%

Q8, Q10:

Q8 - Do you own a car?

- Yes: 22.69%
- No: 77.31%

Q10 - Are you licensed to drive in California?

- Yes: 14.29%
- No: 85.71%
Appendix B - Cross Analysis of Survey Questions

Table 1:

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<td>International/Exchange Program</td>
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<td>52</td>
<td>119</td>
</tr>
</tbody>
</table>

### Table 4:

<table>
<thead>
<tr>
<th>Which of these applies to you? ('Please check all that apply)</th>
<th>Are you licensed to drive in California?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Freshman</td>
<td>8</td>
</tr>
<tr>
<td>Sophomore</td>
<td>14</td>
</tr>
<tr>
<td>Junior</td>
<td>20</td>
</tr>
<tr>
<td>Senior</td>
<td>27</td>
</tr>
<tr>
<td>Super Senior</td>
<td>23</td>
</tr>
<tr>
<td>International/Exchange Program</td>
<td>4</td>
</tr>
<tr>
<td>Transfer Student</td>
<td>20</td>
</tr>
<tr>
<td>Faculty</td>
<td>19</td>
</tr>
<tr>
<td>Staff</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>101</td>
</tr>
</tbody>
</table>
Appendix C - Zipcar and Transportation Survey Questions

As part of the Sustainable City Year Program, we are conducting this survey to gain a better understanding of the transportation needs of students, faculty and staff on campus. No identifying information will be collected. Enter your email for a chance to win one of two $40 gift cards to Peet’s coffee! *email addresses will not be linked to survey data and will solely be used for the raffle prize*

Q1 If you are interested in the raffle, enter your email below. *optional

Q2 Do you wish to be a part of this study?
Yes, No

Q3 What is your affiliation with CSUMB?
Student, Faculty, Staff

Q4 Where do you live?
East Campus, Main Campus, Off Campus

Q5 Which of these applies to you? (Please check all that apply)
Freshman, Sophomore, Junior, Senior, Super Senior, International/Exchange Program, Transfer Student, Faculty, Staff

Q6 Prior to this survey, were you aware of the zipcars at CSUMB?
Yes, No

Q7 Are you a zipcar member
Yes, No

Q8 Do you own a car?
Yes, No

Q9 Rank from 1 to 6 the main reasons for taking trips from your residence. Neglect academic related trips. (Click and Drag to Reorder, 1 = the main reason)

______ Grocery Shopping
______ Errands/Appointments
______ Weekend Trips (Out of Town)
______ Local Entertainment
______ Visiting Family or Friends
______ Work

Q19 Outside of your need to go to campus, on average, how many times per week do you leave your residence? (Please slide the bar to record a numerical value for each of the following)

______ Grocery Shopping
______ Errands/Appointments
______ Weekend Trips (Out of Town)
______ Local Entertainment
________ Visiting Family or Friends
________ Work

Q10 Are you licensed to drive in California?
Yes, No

Q11 Rank from 1 to 6 your considerations when deciding how to travel. (Click and Drag to Reorder, 1 = the main consideration)
________ Travel time
________ Cost
________ Convenience
________ Safety
________ Reliability
________ Environmental

Q12 When considering your biggest transportation need, what is the method you most commonly use?
Personal Vehicle, Bus, Carpool, Walk, Bike, Skate, Zipcar, Uber/Lyft

Q20 When considering your biggest transportation need, what is your most preferred method?
Personal Vehicle, Bus, Carpool, Walk, Bike, Skate, Zipcar, Uber/Lyft

Q13 How long does it usually take you to travel to Main Campus using your most common method?
0-15 minutes, 15-30 minutes, 30-45 minutes, 45-60 minutes, 60 or more minutes

Q14 On average, how many days do you commute to campus each week?
0 days, 1-2 days, 3-4 days, 5-6 days, 7 days

Q15 I am satisfied with that my transportation options on campus
Strongly disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Strongly agree

Q16 Based on the answer above, explain your reasoning.
Appendix D: CSUMB Master Plan Objectives

Campus Regional Use with a Population Growth to 12,700

Building Use with a Population Growth to 12,700

Planned Campus Arrival and Parking Structures
Planned Traffic and Shuttle Routes
## Appendix E - East Market Street Pre-Construction Cyclist and Pedestrian Count

<table>
<thead>
<tr>
<th>Time (A.M.)</th>
<th>E. Market St. from North</th>
<th>2nd Ave. from East</th>
<th>E. Market from South</th>
<th>2nd Ave. from West</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BIKE</td>
<td>OTHER</td>
<td>PED</td>
<td>BIKE</td>
</tr>
<tr>
<td>7:00-7:15</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>7:15-7:30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7:30-7:45</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7:45-8:00</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>8:00-8:15</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>8:15-8:30</td>
<td>0</td>
<td>1</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>8:30-8:45</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>0</td>
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<td>8:45-9:00</td>
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</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>2</td>
<td>31</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time (P.M.)</th>
<th>E. Market St. from North</th>
<th>2nd Ave. from East</th>
<th>E. Market from South</th>
<th>2nd Ave. from West</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BIKE</td>
<td>OTHER</td>
<td>PED</td>
<td>BIKE</td>
</tr>
<tr>
<td>2:00-2:15</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2:15-2:30</td>
<td>0</td>
<td>0</td>
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<td>0</td>
</tr>
<tr>
<td>2:30-2:45</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>2:45-3:00</td>
<td>0</td>
<td>0</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>3:00-3:15</td>
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<td>3</td>
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<td>3:15-3:30</td>
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<td>3:30-3:45</td>
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<td>3:45-4:00</td>
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</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>3</td>
<td>43</td>
<td>0</td>
</tr>
</tbody>
</table>

Grand Total PED: 183
Grand Total BIKE: 1
Grand Total OTHER: 2
Appendix F - Map of Salinas and Intended Road Diet Structure
Appendix G

Aerial Map of Proposed Construction Objectives and Legend

Legend:
- = Existing Condition Description
- = Existing Sidewalk
- = Proposed Condition Description
- = Proposed Road Diet Project Area
- = Proposed Intersection Improvements
- = Proposed Bulb-Out
- = Proposed Class II Bike Lane
- = Proposed Crosswalk Improvements

Appendix H

Average Daily Vehicle Volumes for East Market Street

<table>
<thead>
<tr>
<th>Roadway Location</th>
<th>Average Daily Volumes (vehicles)</th>
<th>Existing</th>
<th>Existing plus Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. Market St between Eucalyptus Dr. and Tont St</td>
<td>8,965</td>
<td>Four-lane Undivided Arterial without left turn lane</td>
<td>A</td>
</tr>
<tr>
<td>E. Market St west of 2nd Ave</td>
<td>5,707</td>
<td>A</td>
<td>A</td>
</tr>
</tbody>
</table>
Appendix I

Road Diet Community Outreach Pamphlets (English and Spanish)

What is a Road Diet?

A typical Road Diet converts an existing four-lane undivided roadway segment to a three-lane segment consisting of two through lanes and a center two-way left-turn lane. The reduction of lanes affects all users such as automobiles, pedestrians, and bicycles. A Road Diet can reduce crashes rates compared to a traditional four-lane undivided roadway.

Resources

Road Diet Information Guide
FHWA-SA-14-028
https://safety.fhwa.dot.gov

Proven Safety Countermeasure
Road Diet Fact Sheet
FHWA-SA-14-003

Contact

Roberta Grewe
FHWA Office of Safety
riehardt@wv.gov
(304) 775-3388

Visit www.safety.fhwa.dot.gov to learn more about Road Diets.

Benefits of Road Diets

Road Diets provide benefits to users of all modes of transportation, including bicyclists, pedestrians, and motorists. Benefits include the following:

- Crash reduction of 10- to 47 percent.
- Reduction of rear-end and left-turn crashes through the use of center two-way left-turn lane (TWL).
- Reduced right-turn crashes as side street motorists must cross only three lanes of traffic instead of four.
- Reduced speed differential due to one lane of traffic in each direction.
- Encourages a more community-focused, "Complete Streets" environment.
- Fewer lanes for pedestrians to cross and an opportunity to install pedestrian refuge islands.
- The opportunity to install bicycle lanes within existing road sections.
- The opportunity to allocate the "leftover" roadway width for on-street parking, transit stops, or other functions.
- Simplifying road crossing and drop selection for motorists making left turns from side streets or the median.

Case Study

Benton, Virginia

Lampman Road, influent end of the 2019 Road Diet
Source: NCDOT, Virginia DOT

Benton, Virginia, a suburb of Washington, DC, is a planned community with a large emphasis on non-motorized travel. Many residents walk or bike to nearby rail stations. The Virginia Department of Transportation (VDoT) implemented a Road Diet in a 2-mile segment of Lampman Road in Benton in conjunction with a repaving project in 2019. Although community reaction was mixed before the project, a new 12" glass fiber reinforced plastic (GFRP) barrier was added to the project, which helped reduce crashes in the corridor by nearly 50%. Community support was so strong that a second Road Diet was installed on the south side of Lampman in 2022, and residents have also achieved a 58% crash reduction. The resulting network of bicycle and pedestrian accommodations provides an excellent travel option for access to the transit stations. The success of the new projects is leading VDoT to expand its use of Road Diets regionally.

Road Diets

A Proven Safety Countermeasure

Four-lane undivided highways have a history of relatively high crash rates, especially at traffic volumes and cutting movements. The main issue is the left-side lane is shared by higher-speed through traffic and turning vehicles. Road Diets reduce the number of vehicles to vehicles conflict points that contribute to non-right turns, left turns, and side-impact crashes.

Studies indicate a 10-47% percent reduction in overall crashes when a Road Diet is installed on a previously four-lane undivided facility and a decrease in crashes involving drivers under 35 years of age and over 65.
Appendix J: School Bell Schedules

Fremont Elementary School

<table>
<thead>
<tr>
<th>Grades</th>
<th>Regular Day</th>
<th>Wednesday</th>
<th>Minimum Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kinder Group A</td>
<td>8:15-12:20</td>
<td>8:15-11:50</td>
<td>8:15-12:20</td>
</tr>
<tr>
<td>Kinder Group B</td>
<td>9:45-2:40</td>
<td>9:15-1:40</td>
<td>8:15-12:20</td>
</tr>
<tr>
<td>1st-6th grade</td>
<td>8:15-2:40</td>
<td>8:15-1:40</td>
<td>8:15-1:10</td>
</tr>
</tbody>
</table>

El Sausal Middle School

Bell Schedule

**Monday, Tuesday, Thursday, and Friday:**
- Period 1/Announcements 8:50 – 9:45 55
- Period 2 9:50 – 10:40 50
- Period 3 10:45 – 11:35 50
- Period 4 11:40 – 12:30 50
- Intervention 12:30 – 1:00 30
- Lunch 1:00 – 1:40 40
- Period 5 1:45 – 2:35 50
- Period 6 2:40 – 3:30 50

**Wednesday:**
- Collaboration 8:40 – 9:40 60
- Period 1/Announcements 9:50 – 10:35 45
- Period 2 10:40 – 11:20 40
- Period 3 11:25 – 12:05 40
- Period 4 12:10 – 12:50 40
- Intervention 12:50 – 1:20 30
- Lunch 1:20 – 2:00 40
- Period 5 2:05 – 2:45 40
- Period 6 2:50 – 3:30 40
### Appendix K: School Bell Schedules

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Street Name</th>
<th>Houses Approached</th>
<th>Houses that only Spoke Spanish</th>
<th>Houses that took the Flyer in person</th>
<th>Left in Mailbox</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/3/16</td>
<td>5:20 PM</td>
<td>First Ave.</td>
<td>23</td>
<td>7</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>11/8/16</td>
<td>4:30 PM</td>
<td>East Market 1st -Sunborn</td>
<td>41</td>
<td>15</td>
<td>22</td>
<td>19</td>
</tr>
<tr>
<td>11/10/16</td>
<td>4:30 PM</td>
<td>Eucalyptus</td>
<td>30</td>
<td>15</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>11/15/16</td>
<td>4:30 PM</td>
<td>Towt</td>
<td>20</td>
<td>5</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>114</td>
<td>42</td>
<td>59</td>
<td>55</td>
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</tbody>
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### Acknowledgements:

James Serrano, Transportation Planner - City of Salinas  
Victor Gutierrez, Assistant Engineer - City of Salinas  
Charlotte Strem, Assistant Director Physical/Environmental Planning - University of California  
Bernard Green - Transportation Agency for Monterey County  
Daniel Fernandez, Capstone Professor  
Gary Peterson- Director of Public Works
References:

Zipcar

http://www.sciencedirect.com/science/article/pii/S0967070X02000288#BIB58

http://www.zipcar.com/press/releases/universitystudy

Institutional Assessment and Research. California State University Monterey Bay. 2015. Enrollment Fall Counts 2005-2015. Available from:

Institutional Assessment and Research. California State University Monterey Bay. Fall 2016. Enrollment Fast Facts (Headcounts) Fall 2016. Available from:


Salinas Road Project


http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.93.9.1431