Integration of both on-and off-campus transportation projects within two different classes at CSUMB

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History of the Two Classes Involved

• Sustainability Systems, offered each fall semester since Fall 2013.

• Infrastructure Systems, offered each spring semester since Spring 2014.
Sustainability Systems
Outcomes

• Define and describe a system, give examples of systems in your everyday life, state and describe principles of system function.
Infrastructure Systems Class Features

Weekly readings, each addressing some aspect of our infrastructure, spanning:

- surveying and GIS
- stormwater/wastewater/drinking water treatment and conveyance
- transportation systems,
- electrical systems,
- waste and recycling,
- communication and the internet
- building
- agriculture
- policy/regulations
Both classes involve a project – segue to Sustainable City Year Program (SCYP) and Campus as a Living Lab (CALL)
What is the Sustainable City Year Program?

As a Part of this program, we are a member of the Educational Partnerships for Innovation in Communities Network (EPICN). This is the (growing) international group of universities each running a program like this.
EPIC-N participating schools

Texas A&M      University of Minnesota
San Diego State   Penn State
University of Iowa   Iowa State University
The College of New Jersey   University of Texas at Austin
University of Tennessee, Knoxville   University of Maryland
University of Connecticut   CSU Monterey Bay
University of Wisconsin- Madison   University of South Florida
University of Saint Thomas   University of Colorado- Denver
Technion- Israel Institute of Technology
Western Washington University   University of Oregon
Chico State   University of Arizona
What is the Campus as a Living Lab program?
This past year, both CSUMB classes described participated both in the Campus as a Living Lab Program (with the planning/transportation department as our partner) and in the Sustainable City Year Program with the City of Salinas Transportation Department as our partner.
Groups each semester worked on projects serving both the campus and the city.

**Sustainability Systems Class** (ENSTU 375) Fall 2015 Projects
(28 students, 7 groups):

**City of Salinas:**
Implications of the West Alisal “road diet” and how it affects regional stakeholders.
What is a Road Diet?

Aspects considered

“Attractiveness” of driving
Speed of traffic
Bike lane availability and its effects on number of bikers
Safety of pedestrians
Time to cross streets
Bus only lane
Lighting, crosswalk, and sidewalk conditions.
Data on cars backed up at an intersection in Salinas, Fall 2015
Data on time it takes to cross the street at a location in Salinas, Fall 2015

![Histogram showing the distribution of time it takes to cross W. Alisal. The x-axis represents the time in seconds (10 to 18), and the y-axis represents the number of occurrences. The data shows a peak around 14-16 seconds with a few occurrences at 10-12 and 17-18 seconds.]
<table>
<thead>
<tr>
<th>date</th>
<th>bus towards downtown salinas</th>
<th>bus towards blanco rd.</th>
<th># of pedestrians</th>
<th># of bikers</th>
<th># cars</th>
<th>traffic light efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/20</td>
<td>MST rides 5:17 line 25 at 5:21pm line 20 at 5:24pm</td>
<td>line 20 at 5:00pm line 23 at 5:13 pm line 25 at 5:32pm</td>
<td>4 pedestrians between 5:25-5:30pm</td>
<td>1 biker 5:22pm</td>
<td>200 cars b/t 5:20-5:30pm</td>
<td>every 30 secs</td>
</tr>
<tr>
<td>11/21</td>
<td>MST rides 4:58pm line 20 5:09pm</td>
<td>line 20 at 4:43 pm</td>
<td>7 pedestrians b/t 4:50-5:10</td>
<td>1 biker at 5:22pm</td>
<td>93 cars b/t 4:45-4:55pm</td>
<td>every 30 secs</td>
</tr>
</tbody>
</table>
## Results of this Stock and Flow model, Fall 2015

<table>
<thead>
<tr>
<th>Stock</th>
<th>Initial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Width</td>
<td>62 ft.</td>
<td>52 ft.</td>
</tr>
<tr>
<td>Avg. Speed of Traffic</td>
<td>29.7 mph</td>
<td>26.3 mph</td>
</tr>
<tr>
<td>Perceived Safety</td>
<td>53.0 pts</td>
<td>70.4 pts</td>
</tr>
<tr>
<td>Avg. Number of People Walking, Biking, Busing</td>
<td>151 people</td>
<td>154 people</td>
</tr>
<tr>
<td>Avg. Number of Cars Backed Up at Stoplight</td>
<td>3.1 cars</td>
<td>5.3 cars</td>
</tr>
</tbody>
</table>
CSUMB-related Projects, Fall 2015

Parking
- How do commuters use parking lots?
- How are the most impacted lots utilized?
- Are students from a nearby residence hall using their cars to get around campus?

Biking
- Which bicycle counters would be the best for the campus to purchase?
- What would be the best location(s) to place bicycle counters?
- What are campus perceptions of sustainable transportation and biking?
- Which policies and regulations would tend to discourage driving and encourage other forms of transportation?
Sample data collected, CSUMB Project, Fall 2015
Parking availability and demand in Science Building’s lot

Yet we still experience 15 cars/0.5 hr (excess traffic)

At this point all spaces are full

Expected variations in spaces during peak hours
Data and modelling of traffic and parking on campus
Model of cars parking in two lots at CSUMB
Predicted fullness of two lots vs time of day
Infrastructure Systems Class (ENSTU 376)  
Spring 2016 Projects

(12 students, 3 groups):

City of Salinas:
Implications of the West Alisal “road diet” – perceptions and justification. Also, video car, bike and pedestrian counts.

CSUMB:
Transportation surveys, bicycle rack inventory and usage, and video car, bike and pedestrian counts.
Should the City do a road diet?

H₀: W. Alisal ADT will be greater than 20,000. AADT > 20,000
View of West Alisal Street and locations of vehicle counters
Traffic volume at one intersection versus time
Traffic breakdown at 4 different intersections on day of measurements in April 2016
CSUMB Student Bernard Green installing a video traffic and pedestrian counter on CSUMB Campus, April 2016
One of the Spring 2016 CSUMB Campus projects: bike rack inventory and usage
Some real exciting opportunities that have occurred as a result of SCYP and CALL projects this past year

Student employability

Crossover of best practices

Increased positive city connections with campus

Enhanced student learning experiences

Specifically, a bike counter on our campus.
Challenges

Time for projects limited by academic schedule!

Added instructor preparation and coordination time (but funding helps to relieve that).

Balance of content and project activity.

Group dynamics can cause tension (but that’s an opportunity!)