Designing and Implementing a Regional Active Transportation Monitoring Program Through a County-MPO-University Collaboration

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Communities Putting Prevention to Work

- County of San Diego HHSA awarded $16M grant to promote physical activity and healthy eating (2010-2012)
- Broad-based policy, systems, organizational and environmental changes in communities and schools
BIKES COUNT: Regional Active Transportation Monitoring
FACT SHEET

BIKES COUNT is a regional bicycle counting program sponsored by the County of San Diego Health and Human Services Agency, the Active Transportation Research (ATR) program at San Diego State University, and the San Diego Association of Governments (SANDAG).

Overview
Bicycle counting equipment was recently installed in streets and along bike routes countywide, to record the number of cyclists (and pedestrians in some locations). These results will support decision-making on future bicycle-related enhancements throughout San Diego County. This is the largest regional network of bicycle-counters in the nation.

Equipment
BIKES COUNT is using equipment purchased from Eco-Counter. Their equipment is state-of-the-art and can sense the electromagnetic footprint of a bicycle and distinguish it from an automobile. This enables in-street counting of cyclists for the first time. A small logger is installed in the side of the roadway and attached to a loop detector installed in the asphalt in the bicycle lane.

Siting Count Equipment
The counting equipment was installed at 28 locations along the SANDAG’s Regional Bicycle Network. The Regional Bicycle Network was also stratified by population density, employment density and median household income, and these sites were used to guide the equipment siting in a manner that would be representative of key factors affecting the demand for cycling.

Data Outputs
Data is collected and summarized at 15 minute increments, but is available in summarized formats by hour, day, week, month, or year. This equipment includes a module that allows for daily data upload without going out into the field. Active Transportation Research is managing the equipment and data access, and has already made bicycle and pedestrian count data available to several projects in the region.

Average Daily Bike Count by Facility Type
Month of September 2012

San Diego Regional Bicycle Network
Bicycle and Pedestrian Counts
SANDAG Active Transportation Research
For More Information: Sherry Ryan, P.E. (858) 565-5304
http://www.sandag.org/ATR
### Contribution to the Active Transportation Monitoring Program

<table>
<thead>
<tr>
<th>Funding $$$$$$ ($350K)</th>
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- Understanding of active travel data gaps

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<th>Technical capacity</th>
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- Understanding of local/regional planning context

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<th>Long-term program funding</th>
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- Integration of active travel in project and planning efforts
Why Counting?

Measure → Understand → Realize Change
Long Range Planning

Travel & Health Monitoring

Infrastructure Evaluation
Benefits of Permanent Automated Counting

- **Consistency**
  *Compare “Apples to Apples”*

- **Temporal Quality**
  *24-Hour Counts at 15’ Intervals*

- **Data Accessibility**
  *Automated Upload of Data*
Presentation Overview

- Technology
- Siting and Installation
- Preliminary Look at Data and Applications
Technology – Eco-Counter

Zelt Logger & Inductive Loops

Pyro

Eco-Multi
Count Station Siting Criteria

1. Geographic Coverage
2. Synch-up with the *Regional Bicycle Network* and *Smart Growth Opportunity Areas*
3. Representative Sampling of Locations
4. Siting Framework that Supports Expansion
Phase I Siting

- 26 TOTAL SITES
  - 15 Bike Only - *Class II or III*
  - 7 Bike & Ped - *Class I*
  - 4 Pedestrian Only - *Urban*
Representative Sampling

Count Locations Identified by Stratified Sample

Close Up View

27 Strata Based on the Combinations of Three Indicators (Population Density, Employment Density, and Median Household Income) and Three Ranges (High, Medium and Low)

Existing Bicycle Network and Proposed Regional Bicycle Network (Potential Count Locations)

• Count Locations
Matching 26 Count Sites to Regional Bike Network

![Graph showing the percent of all RBN segments and phase I percent of count sites by strata.](image)
Selectively Expand Network to 76 Sites

Percent of Segments / Count Locations

Strata (1-27)

Percent All RBN Segments by Strata

Phase II Percent of Sample Locations by Strata
# Phase I Installations

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Number of Units</th>
<th>Number of Sites</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Chula Vista</td>
<td>1</td>
<td>1</td>
<td>Eco-Multi</td>
</tr>
<tr>
<td>2 Coronado</td>
<td>1</td>
<td>1</td>
<td>Eco-Multi</td>
</tr>
<tr>
<td>3 Del Mar</td>
<td>4</td>
<td>1</td>
<td>Zelt &amp; Pyro</td>
</tr>
<tr>
<td>4 El Cajon</td>
<td>2</td>
<td>1</td>
<td>Zelt</td>
</tr>
<tr>
<td>5 Escondido</td>
<td>1</td>
<td>1</td>
<td>Eco-Multi</td>
</tr>
<tr>
<td>6 Imperial Beach</td>
<td>1</td>
<td>1</td>
<td>Zelt</td>
</tr>
<tr>
<td>7 La Mesa</td>
<td>2</td>
<td>1</td>
<td>Zelt</td>
</tr>
<tr>
<td>8 National City</td>
<td>1</td>
<td>1</td>
<td>Eco-Multi</td>
</tr>
<tr>
<td>9 Oceanside</td>
<td>1</td>
<td>1</td>
<td>Zelt</td>
</tr>
<tr>
<td>10 San Diego</td>
<td>17</td>
<td>14</td>
<td>Eco-Multi; Zelt and Pyro</td>
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<tr>
<td>11 San Marcos</td>
<td>1</td>
<td>1</td>
<td>Eco-Multi</td>
</tr>
<tr>
<td>12 Solana Beach</td>
<td>1</td>
<td>1</td>
<td>Zelt</td>
</tr>
<tr>
<td>13 Vista</td>
<td>2</td>
<td>1</td>
<td>Zelt</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>35</strong></td>
<td><strong>26</strong></td>
<td></td>
</tr>
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</table>
Rose Canyon Bike Path - Zelt
San Diego River Bike Path
Eco-Multi
Automated Web-Based Data Upload

Eco-Visio Web-based Software
Data Downloads

Time Intervals
- Annual
- Monthly
- Weekly
- Daily
- Hourly
- 15-minutes

Formats
- Excel Spreadsheets
- Ready-made Charts
- Averages
- Word and PDF Reports
Data Applications

- Understanding Order of Magnitude
- Usage by Facility Types
- Temporal Patterns
  - Month of Year
  - Day of Week
  - Hour of Day
- Improved Measures of Health, Air Quality and Safety
Average Daily Bicycle Travel by Facility Type

October 2012

Class I Bike Path
- Coronado
- Chula Vista
- SD River Bike Path
- National City
- San Marcos
- Escondido
- Del Mar
- La Jolla
- Nimtz
- Pacific Hwy
- Vista
- La Mesa
- El Cajon
- Oceanside
- University Ave
- 30th Street
- 4th & 5th
- Imperial Beach

Class II Bike Lane

Class III Bike Route
Daily Cyclists along Class II Bike Lane
Last Week of September 2012

20-200 cyclists / day
Hourly Cyclists - Rose Canyon Bike Path
1st Week of November – Hourly Volumes

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Thur</td>
<td>9AM-6PM</td>
</tr>
<tr>
<td>Fri</td>
<td>10AM-4PM</td>
</tr>
<tr>
<td>Sat</td>
<td>10AM-3PM</td>
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<tr>
<td>Sun</td>
<td>9AM-2PM</td>
</tr>
<tr>
<td>Mon</td>
<td>8AM-5PM</td>
</tr>
<tr>
<td>Tues</td>
<td>11AM-4PM</td>
</tr>
<tr>
<td>Wed</td>
<td>9AM-5PM</td>
</tr>
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Key Future Data Applications

Estimating Community-wide Daily Bicycle Volumes

Improved Assessments of Health, Air Quality, Safety related to Cycling
Estimating Daily Bicycle Volumes

Percent of Total Daily Volume Occurring Between 4PM - 6PM

\[
\frac{(4PM-6PM \text{ Manual Count})}{(\text{Percent of Total Daily Volume Occurring 4PM-6PM})} = \text{Estimated Total Daily Volume}
\]

50 Cyclist 4PM-6PM ÷ 15% = 333 Daily Cyclists
Groupings of 2-Hour Manual Counts 4PM – 6PM
4 Automated Counters in Close Proximity to Manual Counts
Average Percent of Daily Volume by Hour

- SD Landis Total Cyclists
- 30th Street Total Cyclists
- 4th & 5th Total
- SD University Ave Total Cyclists

The bar chart shows the average percent of daily volume by hour for different locations.
XX\%: Percentage of Daily Count Occurring 4PM-6PM

18.5\%

16.3\%

16.6\%

16.2\%
East – West Bike Flows in North Park

29 Average Minutes per Bike Trip (GPS Data; N=332)

X 1,200 Average Daily Bike Trips (Estimated Daily Volume)

= 34,800 Minutes of Daily Cycling

OR

= 580 Daily Bicycle Hours of Travel
Improved Air Quality & Safety Assessments

- **Air Quality** – (bicycle volumes & intercept surveys)
  - Intercept Cyclists, and ask...
    - Is your trip replacing an auto trip?
    - What’s your origin / destination (trip length)
    - Calculate vehicle-miles avoided via cycling

- **Safety** – (bicycle volumes & collision data)
  - Bicycle Collisions ÷ Daily Estimated Cycling Volumes
Next Steps

- Secure Funding for System Sustainability and Expansion
- Structure Regional Data Access
- Integrate Data into Mainstream Planning and Evaluation
Thank You!

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858-349-5330

http://ipua.sdsu.edu/ATR/
Cyclist Gender and Sidewalk Cycling

**SOUTHEASTERN SD**
82 Total PM Peak Cyclists
- 55% Riding on Sidewalk
- 95% Male

**BARRIO LOGAN**
56 Total PM Peak Cyclists
- 30% Riding on Sidewalk
- 90% Male