Automated Bicycle and Pedestrian Counting

Towards a Regional Active Transportation Monitoring Program

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5-7-2012
Overview

- Purpose of HHSA Funded Research Project
- Manual Counting in San Diego
- Automated Counting
1. Evaluate SANDAG’s Bike to Work Month promotions via longitudinal bicycle and pedestrian counting
   - Manual counts at 75 locations during 3 points of time

2. Establish automated counting program to support active transportation monitoring program
   - 58 units to be installed in 35 locations
Manual Count Siting Process

- Previous “Pit Stop”
- Overlap with SANDAG’s Smart Growth Opportunity Area
- Overlap with Existing Bike Network
- Overlap with San Diego Regional Bicycle Network
- Historic Count Location
Manual Counting

- March, May 20th, and Sept 2011
- AM Peak Period (7AM-9AM)
- Location of Cyclist in ROW (travel lane, bike lane or sidewalk)
- With or Against Traffic Flow
- Gender
- Pedestrians in Crosswalks or within 50’ of crosswalk

SDSU Bicycle Counting Form

<table>
<thead>
<tr>
<th>Time Period</th>
<th>A to B</th>
<th>B to A</th>
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<tbody>
<tr>
<td>07:00 – 08:00</td>
<td></td>
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<tr>
<td>08:00 – 09:00</td>
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Bike Lane Traffic Lane Sidewalk Bike Lane Traffic Lane Sidewalk
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Total:

- Enter a diagram of the count site below, including the bike lane, adjacent travel lanes, intersections, and medians in detail. Mark the counter location with an “X.” Mark the time A represents the counter location and the lane “B.” Indicate the other lane numbers for directions of bicycle travel (A to B and B to A). Also draw a North arrow.
Manual Counts on Bike to Work Day

7AM-9AM Peak Period Bike Count on Bike to Work Day

- 0 - 48
- 49 - 102
- 103 - 272

Existing Bicycle Facilities
San Diego Regional Bicycle Network
Bike to Work Day Results

- Double the Number of Cyclists on Bike to Work Day
  \( \text{Mean} = 55 \text{ cyclists vs. 23 cyclists} \)

- More Men than Women on Bike to Work Day
  \( \text{Mean} = 43 \text{ male cyclists vs. 10 female cyclists} \)

- More Cyclists Seen in ...
  - Low Density Neighborhoods (Mean = 60 vs. 39),
  - High Income Neighborhoods (Mean = 72 vs. 38),
  - High Education Neighborhoods (Mean = 76 vs. 34),
  - Low Percent Hispanics (Mean = 78 vs. 31)
Greater *increases* in cycling rates in...

- Low Density Neighborhoods (Mean = 42 vs. 20),
- High Income Neighborhoods (Mean = 46 vs. 16),
- High Education Neighborhoods (Mean = 46 vs. 16) and
- Low Percent Hispanic (Mean = 48 vs. 14)
Preliminary Findings

- SANDAG’s promotional efforts were effective in increasing cycling on Bike to Work Day
- Increased cycling rates were not maintained after Bike to Work Day
- Cycling *rates* and *increases* in bicycling on Bike to Work Day were significantly lower in underserved areas, suggesting that targeted promotion may be needed in these difficult to reach areas
SDSU Bike Count Project

Simultaneous Parallel Bike Counts Centered on Regional Bike Network
82 Total PM Peak Cyclists
55% Riding on Sidewalk
94% Male

56 Total PM Peak Cyclists
28% Riding on Sidewalk
89% Male
Comprehensive Network of Bike Count Stations

- 75 Manual Locations
- At least one location per segment of Regional Bike Network
- Along the Regional Bike Network
- Overlapping with SGOAs
- Resulted in Approximately 170 locations
Core Network of Automated Count Stations

- 58 units in 35 locations
- Inductive Loops for In-Street Counts along Class II & III
- Combo Infrared and Inductive along Class I Multi-Use Paths
- Infrared along Urban Sidewalk
Proportional Sampling from 27 Strata
Eco-Counter ZELT Inductive Loop

Designed to ignore all motorized traffic.

- Bike lanes
- Bike boulevards
- Bike/bus lane
ZELT Inductive Loop
Eco-Counter PYRO Box

- Pyro Box Compact to count pedestrians
- Portable or permanent solution
- Uses body heat to register counts
Combining the ZELT Greenway and the PYRO to count both pedestrians and cyclists
Eco-Multi
Camino Del Mar, SB at south leg of 14th Street – ID 1007A & 1007B

- Red: Zelt Logger installed in valve box underground
- Red: Inductive loop installed in asphalt
- Green: Pyro Sensor installed on city pole
Camino Del Mar  NB at 14th Street - ID 1007C & 1007D

- Zelt Logger installed in valve box underground
- Inductive loop installed in asphalt
- Pyro Sensor installed on city pole
Coast Highway, south of Lomas Santa Fe – ID 1006

- Zelt Logger installed in valve box underground
- Inductive loop installed in asphalt
East Washington Avenue (EB), west of Jamacha Rd – 1022A

- Zelt Logger installed in valve box underground
- Inductive loop installed in asphalt
East Washington Avenue (WB), east of Jamacha Rd – 1022B

- Zelt Logger installed in valve box underground
- Inductive loop installed in asphalt
Bayshore Bikeway, north of E Street – ID 1035

Multi Wooden Post
Inductive loop installed in asphalt and connected to logger in Multi Urban Post
SR-56 Bike Path, west of Camino Del Sur – ID 1009

- Zelt Logger installed in valve box underground
- Inductive loop installed in path and connected to Zelt Logger
Sweetwater Bike Path at the eastern terminus near Plaza Bonita

Multi Wooden Post

Inductive loop installed in asphalt and connected to logger in Multi Wooden Post
Summary of Installation to Date

17 Units Installed in 11 Cities
- El Cajon (2)
- Del Mar (4)
- Solana Beach (1)
- Chula Vista (1)
- National City (1)
- Imperial Beach (1)
- Oceanside (1)
- Escondido (1)
- San Marcos (1)
- La Mesa (2)
- Vista (2)

41 Units to be Installed
- Carlsbad (2)
- San Diego (38)
- Coronado (1)
Automated Web-Based Data Upload

Eco-Visio Web-based Software
Data at Your Fingertips!!

Total Daily Cyclists on Bayshore Bikeway (Chula Vista) February 2012

- 250-300 Cyclists
- 450-550 Cyclists
Del Mar Ciclists - Feb 2012

01/02/2012 - 28/02/2012

1007A – Southbound
1007C - Northbound
Installation – February 8, 2012

County of San Diego Healthy Works and San Diego State University
- 1200-2000 weekend cyclists
- 400-800 weekday cyclists
- 1000-1900 weekend cyclists
- 400-700 weekday cyclists
Data Applications

- Use *daily data* to extrapolate peak period manual counts to daily counts at other locations

- Build justifications for bicycle facilities & treatments

- Track activity over time to understand effectiveness of efforts to shift mode of travel

- Use daily counts with intercept surveys to calculate Bicycle Miles traveled, frequency of bike trips by purpose, etc.
Questions?

Thanks!

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