Methods and Technologies for Pedestrian and Bicycle Volume Data Collection

NCHRP 7-19

ITS Maryland 2013 Annual Meeting

Kelly M. Laustsen
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Presentation Overview

- Project Purpose
- Research Approach
- Overview of Technology Testing Activities
- Initial Findings
- Upcoming Activities
NCHRP 7-19 Research Team

- Kittelson & Associates, Inc.
  - Principal Investigator is Paul Ryus
- Toole Design Group
- UC Berkeley, SafeTREC
- McGill University
- Quality Counts, LLC
Project Purpose

- Address lack of pedestrian and bicycle volume data
  - Barrier to planning effective facilities
  - Standard procedures for vehicular data collection
- Assess variety of existing and new technologies and methods
- Develop guidance for practitioners
Research Approach

- Conduct literature review
- Develop work plan
- Survey and outreach
- Investigate technologies and methods
- Produce guidance document for practitioners
Key Outcomes

- Guidance for developing and running a non-motorized count program to support activities such as...
  - Developing improved crash analysis and prediction tools related to pedestrian and bicyclists
  - Understanding of existing pedestrian and bicycle volumes on network
  - Establishing a database to measure changes in volume over time
  - Building towards ability to estimate latent demand for pedestrian and bicycle travel
Early Findings

- Counting programs and current count practices
  - Limited established count programs in the U.S., but lots of interest
  - Need and desire for guidance
  - Manual counts most common in current practice

Source: www.jamartech.com
Early Findings

- **Count technologies**
  - Automated count technology is growing rapidly
  - Manufacturers of automated count technologies tend to be from outside of the U.S.

Source: www.metrocount.com
Early Findings

- **Correction and extrapolation factors**
  - **Correction factors** adjust counts to eliminate inaccuracies due to data collection technology used
  - **Extrapolation factors** is an area of needed research
    - Temporal
    - Land use
    - Weather
    - Demographics
Testing Plan

- Focus on testing and evaluating commercially available automated technologies
- Assess type of technology as opposed to a specific product
- Cover a range of facility types, mix of traffic, and geographic locations
- Evaluate accuracy through the use of manual count video data reduction
Site Locations and Technologies

### Site Locations
- Portland, OR
- San Francisco, CA
- Davis, CA
- Berkeley, CA
- Minneapolis, MN
- Washington, D.C.
- Arlington, VA
- Montreal, Canada

### Technologies
- Radio Beam/Wave
- Infrared
- Pneumatic Tubes
- Inductive Loops
- Combinations of Technologies
Portland, OR

- 5th Avenue (Downtown) Sidewalk
  - Passive Infrared
  - Radio Beam

Source: www.eco-compteur.com
Portland, OR

- Eastbank Esplanade multiuse path
  - Passive Infrared
  - Pneumatic Tubes
  - Radio Beam
San Francisco, CA

- Fell Street Bicycle Lane
  - Passive Infrared
  - Pneumatic Tubes
  - Inductive Loops
Minneapolis, MN

- Midtown Greenway multiuse path
  - Passive Infrared
  - Radio Beam
  - Inductive Loops
  - Piezoelectric Sensors
Washington, D.C. and Arlington, VA

- Key Bridge separated path
  - Passive Infrared
  - Pneumatic Tubes
  - Passive Infrared with inductive loops
Initial Findings

- Reduced data from initial round of video collection
- Begun developing plots to compare automated and manual counts
- Preliminary results suggest:
  - Undercounting effect that increases in magnitude as volumes increase
  - Active infrared sensor appears to work very well, with a roughly linear undercount
Initial Findings

Note: Results shown are preliminary
Upcoming Activities

- **Continuing data collection**
  - Target high volume and high mixed volume conditions
  - Capture inclement weather conditions

- **Continuing data assessment**
  - Analyze whether there are statistically significant differences in error under different operating conditions for the various technology types

- **Developing guidebook content**
Upcoming Activities

- Topics to be covered by guidance:
  - Potential applications/use for pedestrian and bicycle counts (illustrated with case studies)
  - Developing a data collection plan tailored to the desired application(s) of the counts
  - Selecting one or more counting methods/technologies to match the desired application and site conditions
  - Adjusting the count results to reflect built-in biases of particular technologies or count devices
Questions?

- Contact Information
  - Kelly Laustsen
  - klaustsen@kittelson.com
  - 503.535.7439