Title:
Counting Bicyclists with Pneumatic Tube Counters on Shared Roadways

Authors:
Alex Hyde-Wright
Transportation Engineering Intern
Boulder County Transportation
ahyde-wright@bouldercounty.org
(303) 441-4910

Brian Graham, AICP
Bicycle Planner/ Employee Transportation Coordinator
Boulder County Transportation
bgraham@bouldercounty.org
(720) 564-2667

Krista Nordback, Ph.D, PE
Researcher
Active Communities Transportation Research Group
Center for Sustainable Infrastructure Systems
Department of Civil Engineering
University of Colorado Denver
krista.nordback@ucdenver.edu
(303) 556-5247

Organizational Affiliation:
Boulder County, Colorado

Contact Email Address:
ahyde-wright@bouldercounty.org

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Abstract:
Local governments investing in bicycle infrastructure often lack good methods for documenting bicyclist volumes, an essential metric for evaluating the usage and relative safety of bicycle infrastructure. Previous work has shown that limited manual counts often do not provide enough data to accurately estimate the annual average daily volume of bicyclists (Nordback, 2012). Studies have proven inductive loop counters can accurately count bicyclists on shared roadways (Nordback, 2011), but their cost and permanence often limits the number of locations that can be counted. This study determines the accuracy of using portable pneumatic tube counters to simultaneously conduct short-term counts of both bicyclists and motor vehicles.

It was discovered that how the tubes are attached to the road has a very large impact on the accuracy of this type of counter. It was found to be essential to secure the tubes in a manner that does not pinch or kink them. It was also discovered that existing classification schemes used to classify vehicles by wheelbase are inadequate to accurately classify bicyclists and motor vehicles in mixed traffic as they tend to classify groups of bicyclists as trucks. Therefore, it is essential to use the classification scheme developed as part of this study, which can accurately differentiate between groups of bicyclists and multi-axle trucks.

As part of this study the pneumatic tubes were set up at multiple locations on Boulder County roads and over 2,000 bicyclists were observed crossing the tubes. The equipment’s accuracy was determined by comparing its count to the manual tally. When proper attachment methods were used in conjunction with the new classification scheme, accuracies ranged from 74% to 77% for bidirectional counts using a single counter and averaged 94% on the close side of the roadway. This study illustrates that when correction factors are used to correct for the observed undercounts, it is possible to accurately count bicyclists and motor vehicles at the same time with the same equipment.

References: