What do we know about bicycling activities in suburban and exurban environments?

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ABSTRACT

Few places comprehensively collect data on bicycling activities across a broad spectrum of environments. Presented here is an ongoing county-wide bicycle and pedestrian data collection effort by the Chittenden County Regional Planning Commission (CCRPC) and the University of Vermont (UVM) Transportation Research Center (TRC). Locations were distributed throughout Chittenden County, with a special effort made to include places where little or no non-motorized activities were expected or would be assumed.

INTRODUCTION

Chittenden County, home to Burlington (Vermont’s largest city), has a bicycle- and pedestrian-friendly core, but the county as a whole has large areas of suburban, exurban, and rural environments. To determine non-motorized activities across these different contexts, the following questions are posed:

• Is bicycle and pedestrian traffic zero or negligible in most suburban and exurban areas, as many traffic models assume?
• What methods can be used to measure volumes outside of urban cores with minimal time and effort?
• What benefits and shortcomings do each data collection method have?
• How should a county-wide data collection program be implemented across a wide variety of environments?

Four methods were used across the county to experiment with different equipment and maximize the data collection efforts.

DATA COLLECTION METHODS

1) Video Counts
• Camera strapped to utility pole
• Powered by a large battery
• Records to SD card
• Manual review: 2hr/24hr video

2) EcoCounters
• Infrared & pyroelectric sensors encased in a box
• Strapped to utility pole
• Data downloaded periodically

3) Manual Counts
• Electronic counters or pen/paper

Legend for the bullets:

- Useful in any area with poles
- Not limited by real time; can be reviewed later in an office
- Automated review possible
- Setup takes two people
- Manual review labor intensive
- Completely automated
- Small & unobtrusive
- Only suitable for facilities away from motor vehicles
- Accuracy problems for high volumes
- Equip. cost low for pen/paper
- Suitable for many facilities
- Labor intensive, often only used for peaks at busy locales
- Limited to real time human errors & counter setups
- Simple set up
- Automated counts & speeds
- Tubes vulnerable to damage
- Requires set up time on road
- Count accuracy problems, especially on gravel roads

FURTHER RESEARCH

These data collection efforts demonstrate that appreciable bicycling activities exist beyond the urban core and that volume data can be collected across different types of environments at relatively low costs. With proven data collection methods, further research should be conducted to establish relationships between non-motorized volumes and elements of the environment in different contexts.

Due to lower population densities and greater separations between activities, the relationships between bicycling and walking activities in suburban, exurban, and rural areas may be different from those in more urbanized environments where much of the non-motorized transportation research has been conducted. Establishing new quantitative relationships or confirming existing ones between the road facilities, surrounding land use, and non-motorized volumes will contribute to a better understanding of these activities in different contexts.

COUNT DATA AND FINDINGS

The following findings resulted from the 24-hr video counts and the comprehensive data collection process:

• Bicycle and pedestrian volumes are significant in some exurban locations, and are rarely zero
• Video counts, EcoCounters, manual counts, and pneumatic tubes are all viable bicycle and pedestrian volume collection methods
• In urban cores, manual counts are most effective, while on rural roads, video counts are ideal
• For shared use paths, EcoCounters are suggested, while pneumatic tubes are best used when simultaneously collecting motor vehicle data
• It is possible to automate video count footage analysis, though further work is necessary
• EcoCounters can provide seasonal adjustment factors, and, when modified, count road shoulders

With improving data collection methods, more diverse data can be collected, leading to a greater understanding of bicycle and pedestrian activities.

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