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APPENDIX F – BIKE COUNTS

Conducting regular bike counts is an important component of any bicycle plan. Counts conducted on an annual or bi-annual basis provide data that is critical for tracking plan. Such data can be used to justify funding of facilities, document benefits, and understand the correlation between bicycle facilities and bicycling trends. Counts should be done around the same time of year, at the same time of day, and if possible, with similar weather conditions. Annual bike counts typically involve coordinating volunteers with hand counters at strategic locations within the bicycle network. There are also a number of automatic counting devices that can be used to both supplement volunteer-based count locations and conduct before and after counts on specific newly installed facilities throughout the year, if needed. Information on different bike count methods and technologies is provided below.

Manual Counts

The National Bicycle and Pedestrian Documentation Project (http://bikepeddocumentation.org/) provides information on how to conduct volunteer-based bicycle counts and how to adjust/interpret the data that is collected. A number of communities and agencies across the country have established bike count programs. Below are just a few:

- **Seattle, WA**
- **Portland, OR**
- **Washington State Department of Transportation**
- **Philadelphia, PA**
- **Chicago, IL**
- **Mid-Ohio Regional Planning Commission**
- **Minneapolis, MN**

Automatic Count Technologies

Automatic count technologies are useful in conducting longer-term counts, establishing daily, weekly, or monthly variations and almost always require fewer person-hours. The most common technologies used for bicycle and pedestrian counts are:

- **Passive infrared (detects a change in thermal contrast)**
- **Active infrared (detects an obstruction in the beam)**
- **Ultrasonic (emits ultrasonic wave and listens for an echo)**
- **Doppler radar (emits radio wave and listens for a change in frequency)**
- **Video Imagining (either analyzes pixel changes or data are played back in high speed and analyzed by a person)**
- **Piezometric/Pneumatic (senses pressure on a material either tube or underground sensor)**

- **In-pavement magnetic/inductive loop (senses change in magnetic field as metal passes over it)**

The choice of an automatic count technology primarily depends on the type of data that is required to be collected, the project budget, and the number of people who can work on the project. All automatic count technologies require calibration. The following table outlines count technologies most adaptable to bicycle and pedestrian counts.

Technology	How it Works	Differentiate between bikes and	Where can it be used?	Can it be moved to other	Other Considerations	Technol ogy Cost
Passive infrared	Detects a change in thermal contrast	No	Sidewalk, path	Easily		$,2000-3,000
Active infrared	Detects an obstruction in the beam	Yes	Sidewalk, path	Easily		$800-$7,000
Video imaging	Analyzes pixel changes	Unknown	Intended for indoor use	Yes	Difficult detection outdoors, no bike/ped application yet	$1,200-$8,000
Video playback	Video analyzed by a person	Yes	Anywhere	Yes	Difficult detection at night and bad weather. Considerable staff time	$7,000
Piezometric Tube	Senses pressure on tube	No	Path, on- street	Easily	Bicycles only. Potential tripping hazard	$1,600
Piezometric Pad	Senses pressure	No	Sidewalk, path	No		$2,000-3,000
In- pavement magnetic loop detectors	Senses magnetic field change as metal passes	No	Path, on- street	No	Requires cutting into pavement or into ground to install	$2,000-3,000

Source: National Bicycle and Pedestrian Documentation (June 2009)

Additional Resources

Pedestrian and Bicycle Data Collection in United States Communities: Quantifying Use, Surveying Users, and Documenting Facility Extent (2005)

http://www.pedbikeinfo.org/pdf/casestudies/PBIC_Data_Collection_Case_Studies.pdf

The purpose of this study is to share information about existing data collection efforts and provide the results to practitioners who want to collect pedestrian and bicycle data in their communities.

Case study analysis of pedestrian and bicycle data collection in U.S. communities (Toole Design Group, FHWA, 2005)

http://cat.inist.fr/?aModele=afficheN&cpsidt=18477918

This paper provides a summary of recent research that was sponsored by FHWA and the Pedestrian and Bicycle Information Center to review and evaluate bicycle and pedestrian data collection methods throughout the United States. It uses a case study approach to evaluate pedestrian and bicycle data collection in 29 different agencies throughout the country in communities ranging in size from 6,000 residents (Sandpoint, Idaho) to 8 million residents (New York City). These case studies are analyzed in the following data collection categories: manual counts, automated counts, surveys targeting nonmotorized transportation users, surveys sampling a general population, inventories, and spatial analyses. The results provide information about the methods and the optimum timing for pedestrian and bicycle data collection; emerging technologies that can be used to gather and analyze data; the benefits, limitations, and costs of different data collection techniques; and implications for a national data collection strategy.

Automatic Bicycle Counting (2002)

http://www.ipenz.org.nz/ipenztg/papers/2002_pdf/34_MacBeth.pdf

This paper summarizes research undertaken for Transfund New Zealand by MWH New Zealand Ltd in Christchurch between October 2001 and May 2002 to evaluate automatic bicycle counting technologies. A comprehensive report of the research findings has been published by Transfund as "Evaluation of Automatic Bicycle Counters in New Zealand".

The researchers tested two pneumatic tube counters, one marketed specifically for bicycles and the other for general vehicle traffic. Both performed satisfactorily, and could differentiate bicycles, motorcycles, and automobiles.

The report also discusses traffic conditions and how they affect data collection.

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